FEEDING INFANTS AND CHILDREN FROM BIRTH TO 24 MONTHS

Summarizing Existing Guidance

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Committee on Scoping Existing Guidelines for Feeding Recommendations for Infants and Young Children Under Age 2

Food and Nutrition Board

Health and Medicine Division

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COMMITTEE ON SCOPING EXISTING GUIDELINES FOR FEEDING RECOMMENDATIONS FOR INFANTS AND YOUNG CHILDREN UNDER AGE 2

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This Consensus Study Report was reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise. The purpose of this independent review is to provide candid and critical comments that will assist the National Academies of Sciences, Engineering, and Medicine in making each published report as sound as possible and to ensure that it meets the institutional standards for quality, objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process.

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Although the reviewers listed above provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations of this report nor did they see the final draft before its release. The review of this report was overseen by **DIANE BIRT,** Iowa State University, and **BARBARA ABRAMS,** University of California, Berkeley. They were responsible for making certain that an independent examination of this report was carried out in accordance with the standards of the National Academies and that all review comments were carefully considered. Responsibility for the final content rests entirely with the authoring committee and the National Academies.

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Summary[1]

Recommendations for feeding infants and young children have changed substantially over time owing to scientific advances, cultural influences, societal trends, and other factors. At the same time, stronger approaches to reviewing and synthesizing scientific evidence have evolved, such that there are now established protocols for developing evidence-based health recommendations. However, not all authoritative bodies have used such approaches for developing infant feeding guidance, and for many feeding questions there is little or no sound evidence available to guide best practices, despite the fact that research on infant and young child feeding has expanded in recent decades. Summarizing the current landscape of feeding recommendations for infants and young children can reveal the level of consistency of existing guidance, shed light on the types of evidence that underpin each recommendation, and provide insight into the feasibility of harmonizing guidelines.

THE COMMITTEE'S TASK AND APPROACH

With support from the Centers for Disease Control and Prevention and from the National Institutes of Health, the National Academies of Sciences, Engineering, and Medicine convened an ad hoc consensus committee that was asked to collect, compare, and summarize existing recommendations on what and how to feed infants and young children from birth to

[1] This summary does not include references. Citations to support the text herein are provided in the body of the report.

24 months of age (see Box S-1). The committee was also asked to make recommendations to stakeholders on strategies for communicating and disseminating feeding recommendations.

The committee's search for guideline documents that included recommendations on what and/or how to feed infants and children from birth to 24 months focused on resources from government agencies and from authoritative domestic and international organizations. Guideline documents were found by performing targeted website searches, further supplemented by using the Food and Agriculture Organization of the United Nations' catalog of food-based dietary guidelines, by leveraging expert input, and by searching databases (e.g., ECRI Institute Guideline Trust, CPG Infobase: Clinical Practice Guidelines, PubMed).

BOX S-1
Statement of Task

An ad hoc committee under the auspices of the National Academies of Sciences, Engineering, and Medicine will be convened to review and assess publicly available guidance on feeding practices for infants and children up to 2 years of age. The committee will:

- Identify and collect public-facing documents and resources about *what to feed* and *how to feed* infants and children from birth up to 2 years of age. The scope of resources will include domestic sources, such as guidance from federal agencies in the United States and Canada; authoritative organizations, such as the American Academy of Pediatrics and the Robert Wood Johnson Foundation; and international sources, including but not limited to the World Health Organization.
- Compile a comprehensive list of the topics addressed in the documents collected, along with the type of evidence cited in support of each topic.
- Note the basis for the recommended feeding practices by each source, describe the level of agreement between sources, and assess differences between the guidance documents.
- Assess the documents for descriptions of "best practices" as well as for implementation strategies to support communication and dissemination of feeding guidance.

The committee will produce a report that includes a comparison of the guidance documents reviewed with documentation of the type and strength of evidence underpinning each guideline. The report will inform stakeholders about the feasibility of consolidating feeding guidelines and/or harmonizing guidance across sources of advice for *what* and *how* to feed infants and children up to 2 years of age, and will make recommendations about communication strategies to the stakeholder community.

The identified documents and resources varied in span and scope, and they required a screening process to determine whether the guideline document contained feeding recommendations and, if so, which of the recommendations addressed the concepts of *what* or *how* to feed infants and young children. To that end, the committee established guideline document-level and recommendation-level eligibility criteria (see Table S-1).

TABLE S-1 Guideline Document- and Recommendation-Level Eligibility Criteria

Level	Inclusion Criteria	Exclusion Criteria
Guideline document-level eligibility criteria	• The most current recommendations or guidelines from authoritative agencies and organizations • Documents that provided guidance related to what or how to feed human milk, infant formula, other foods and beverages, and supplements to infants and children younger than 24 months of age[a] • Includes guidance relevant to high-income countries[b] • Includes general guidance for the healthy mother–infant dyad, without consideration of modifying adverse clinical health conditions • Readily available on the Internet	• Documents that exclusively provide feeding recommendations for preterm infants • Clinical treatment guidelines for a specific disease or condition • Guideline documents from, for, funded by, or in collaboration with industry • Documents that exclusively provide guidance related to clinical management of lactation • Position statements that only support or describe the benefits of breastfeeding without providing additional recommendations about how to feed (e.g., duration, frequency) • Position statements that only recommend methods for preparing and storing foods, including breastmilk and formula • Guidance for establishing or operating donor milk banks • Documents providing guidance related to malnutrition or emergency situations • Guidance relevant to the intake of breastfeeding mothers • Documents about infant formula composition • Documents that have the primary purpose of being a communication or dissemination tool (e.g., training manual, pamphlets) • Documents published before 2000 • Documents not available in English

continued

TABLE S-1 Continued

Level	Inclusion Criteria	Exclusion Criteria
Recommendation-level eligibility criteria	• Recommendations that provide guidance related to what and/or how to feed human milk, infant formula, other foods and beverages, or supplements to infants and children younger than 24 months of age[c]	• Recommendations on topics listed in the document-level exclusion criteria[d] • Dietary Reference Intake or other dietary reference values for individual nutrients • Recommendations related to peanut allergy prevention that were prepared or published before the release of the LEAP trial[e]

NOTE: LEAP = Learning Early About Peanut Allergy.

[a] Summaries of the state of science in an attempt to make recommendations, but which found inadequate evidence to do so, were considered eligible.

[b] Countries' income levels classified using the fiscal year 2020 World Bank classification (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups; accessed November 8, 2019).

[c] Recommendations may include the primary prevention of food allergies and other common conditions (e.g., diarrhea, constipation, dental caries). However, recommendations on the treatment of a condition were excluded.

[d] Recommendations were excluded if they were about preterm infants; clinical treatment of a specific disease or condition; clinical management of lactation; the benefits of breastfeeding; methods for preparing and storing foods, including breastmilk and formula; malnutrition or emergency situations; intake of breastfeeding mothers; or infant formula composition.

[e] Many agencies, organizations, and groups used the LEAP trial to update feeding guidelines related to the primary prevention of peanut allergy. Inclusion of peanut allergy–related recommendations predating the release of the LEAP trial results would unnecessarily introduce inconsistency and those earlier recommendations were therefore excluded.

The committee abstracted each eligible recommendation verbatim, along with the type of evidence that directly mapped to the recommendation and the associated strength-of-evidence rating, if available. Abstracted recommendations were sorted by topic area and thematically grouped within each topic. Within each theme, the committee reviewed the guidance provided in the verbatim recommendations to describe the level of consistency across guideline documents. The committee also summarized the type of evidence that mapped to each recommendation within a given theme.

For each guideline document, the committee noted any information that the organization included about communicating or disseminating the feeding recommendations. As the available guidance was limited in scope, the committee performed exploratory scans for examples of communication and dissemination materials from the resources and websites reviewed in its guideline document search.

CONSISTENCY OF EXISTING FEEDING RECOMMENDATIONS

The committee identified 156 potentially relevant documents, webpages, and resources through its various search strategies. After applying the eligibility criteria, 43 guideline documents remained to be reviewed in more detail. Included guideline documents reflected the contributions of 26 different agencies, organizations, or groups from Australia, Canada, Europe, Italy, New Zealand, the United Kingdom, and the United States, along with global guidance from the World Health Organization. Nine of the guideline documents were collaborative efforts between two or more organizations.

The included guideline documents varied with respect to the document type (e.g., position statement, clinical practice reports), level of collaboration across organizations, scope of topics covered, target audiences, overall methodologies, presentation of recommendations, and mapping of evidence to each recommendation. Few guideline documents graded the evidence, and those that did often used different rating systems. This heterogeneity likely contributed to some of the noted inconsistencies found across recommendations.

Comparison of Guidance on What to Feed

The majority of abstracted recommendations provided guidance on *what* to feed (as opposed to *how* to feed) infants and young children from birth to 24 months. Eligible recommendations were found in all 43 guideline documents. The committee grouped the recommendations into 18 topic areas, with most topic areas having multiple themes. The committee's comparison of recommendations on what to feed children from birth to 24 months of age is presented in Table S-2. The type of evidence mapping to each recommendation was varied. Most recommendations mapped to narrative reviews, with fewer mapping to systematic reviews. Some recommendations mapped to other types of evidence (e.g., government reports and websites, single scientific publication) and some could not be mapped to any specific evidence.

Comparison of Guidance on How to Feed

Approximately one-third of the abstracted recommendations provided guidance related to *how* to feed infants and young children from birth to 24 months of age. Eligible recommendations were found in 23 of the guideline documents. The committee grouped the recommendations into eight topic areas, with most topic areas having multiple themes. The committee's comparison of recommendations on how to feed children from

TABLE S-2 Summary of the Consistency of Recommendations on What to Feed Infants and Young Children, by Topic Area

Topic Area	Summary of Consistency Across Recommendations
Exclusive breastfeeding	• Generally consistent in terms of recommending exclusive breastfeeding for up to, about, or around 6 months of age
Continuation of breastfeeding	• Generally consistent in being in support of continuing breastfeeding for at least 12 months • Not consistent in terms of the specific age to which breastfeeding should be continued
Supplementary formula feedings	• Consistent in indicating that breastfed infants should not be routinely given supplementary formula feedings
Duration of formula use	• Generally consistent in recommending that, for formula-fed infants, commercial infant formula should be used until 12 months of age • Consistent in indicating that infant formula is not needed beyond 12 months of age
Type of infant formula	• Consistent in recommending cow milk–based infant formulas for formula-fed infants • Consistent in recommending that the use of soy-based formula be limited to special circumstances
Toddler milks and follow-on formulas	• Consistent in recommending against the general use of toddler milks
Milk and milk-based products	• Generally consistent in recommending against cow milk before 9 months of age • Not consistent regarding suitability of cow milk for infants 9–12 months of age • Not consistent in whether milk can be added to complementary foods before 12 months of age • Generally consistent in indicating that whole milk should be provided to children in the age range of 12–24 months • Consistent in indicating that the amount of cow milk should be limited for children 12–24 months of age • Some inconsistencies in the recommended limit for the amount of cow milk for children 12–24 months of age • Consistent in recommending against providing flavored milk to infants and young children
Fluids: Water, juice, sugar-sweetened beverages, and other nonmilk beverages	• Consistent in discouraging the provision of water to breastfed infants 0–6 months of age • Consistent in recommending provision of water to infants 6–12 months of age and children older than 1 year • Generally consistent in stating that juice should not be provided in the first 12 months of life

TABLE S-2 Continued

Topic Area	Summary of Consistency Across Recommendations
Fluids: Water, juice, sugar-sweetened beverages, and other nonmilk beverages (continued)	• Generally consistent in recommending that juice intake for toddlers not exceed 4 ounces per day • Consistent in recommending against providing infants and young children with sugar-sweetened beverages • Consistent in recommending against providing coffee, tea, and caffeinated beverages to infants and young children • Generally consistent in recommending against providing plant-based beverages to infants or young children[a]
Substances to avoid or limit[b]	• Consistent in recommending that foods for infants and young children should be prepared without added sugars • Consistent in recommending that if pre-prepared foods and snacks are offered to young children, they should contain no or limited added or total sugars • Consistent in recommending that if foods with sugars are consumed, they should be consumed at mealtimes instead of as snacks • Consistent in advising against dipping pacifiers or bottle teats in substances with sugars • Consistent in recommending that foods for infants and young children be prepared without adding salt • Consistent in recommending that if pre-prepared foods and snacks are offered to young children, they should contain no or limited salt
Variety and healthy, nutritious foods	• Consistent in recommending that a variety of foods and food groups, textures, and flavors can help meet nutritional requirements
Fruits and vegetables	• Consistent in recommending consumption of a variety of fruits and vegetables
Vegetarian and vegan diet	• Consistent in stipulating the need for a carefully planned diet to meet requirements for several key nutrients • Some inconsistencies in explicitly mentioning a need for fortified products or nutrient supplements for vegans • Generally consistent in mentioning plant-based beverages as an option for toddlers in the context of specific dietary preferences
Foods associated with food allergy and celiac disease	• Consistent in recommending that introduction of potentially allergenic foods should not be delayed • Not consistent in recommending when and how to introduce peanuts based on the infant's risk for peanut allergy • Generally consistent in recommending not delaying introduction of allergenic food beyond 6 months of age, including eggs
Iron	• Consistent in acknowledging the importance of iron-rich complementary foods • Not consistent in recommended age of introduction of iron-rich complementary foods • Consistent in recommending that formula-fed infants be given iron-fortified infant formulas until at least 6 months of age

continued

TABLE S-2 Continued

Topic Area	Summary of Consistency Across Recommendations
Iron (continued)	• Some inconsistencies in duration of use of iron-fortified formulas for formula-fed infants, and suggested iron content of infant formulas • Generally consistent in advising against general use of iron supplements[c] • Consistent in recommending the need for adequate intake of iron among infants fed vegetarian or vegan diets
Vitamin D	• Generally consistent in recommending vitamin D supplementation among breastfed infants • Consistent in relating the need for vitamin D supplementation for formula-fed infants to the total amount of daily infant formula intake • Not consistent regarding the amount of infant formula intake that necessitates vitamin D supplementation • Consistent in recommending vitamin D supplementation for high-risk or vitamin D–deficient children 12–24 months of age
Iodine	• Consistent in recommending against the use of iodine supplements
Other nutrient supplements	• Generally consistent in stating that nutrient supplements are not needed for infants and young children consuming a healthy, varied diet[d] • Consistent in recommending that fluoride supplementation for infants and young children be contingent on the fluoride status of the water supply
Dietary fat	• Consistent in noting the importance of diets with adequate fat content • Consistent in recommending against foods high in saturated and/or trans fats • Consistent in recommending plant oils

NOTE: The committee uses the following phrases to describe consistency of recommendations:
- *Consistent* indicates alignment across the recommendations.
- *Generally consistent* indicates that the recommendations tended to provide similar guidance, although there were some differences in details or wording.
- *Some inconsistencies* indicates mixed recommendations, some of which align.
- *Not consistent* indicates recommendations provided different guidance on a topic.

[a] This statement pertains to general use of plant-based beverages. A caveat is noted in the "Vegetarian and vegan diet" section.

[b] Recommendations regarding foods to avoid or limit based on food safety considerations (e.g., unpasteurized beverages, honey due to the risk of botulism) are summarized in Table S-3 in the "Safety of foods and feeding practices" section.

[c] A recommendation in a 2010 guideline document predated the acceptance of delayed cord clamping in the United States, which changed iron supplementation recommendations for infants. The statement of consistency reflects only the more recent guideline documents.

[d] This statement pertains to nutrient supplements generally. Consistency of recommendations related to supplementing specific nutrients are noted elsewhere in the table.

birth to 24 months of age is presented in Table S-3. As was the case with recommendations on what to feed infants and young children, the type of evidence mapping to each recommendation varied, but the recommendations predominantly mapped to narrative reviews.

TABLE S-3 Summary of the Consistency of Recommendations on How to Feed Infants and Young Children, by Topic Area

Topic Area	Summary of Consistency Across Recommendations
Bottle use and propping	• Generally consistent in recommending against certain foods and fluids being added to bottles • Generally consistent in recommending that bottle use be discontinued at about 12 months of age • Generally consistent in recommending that infants not go to bed or to sleep with a bottle • Consistent in recommending against bottle propping
Cup use	• Generally consistent in recommending that infants should transition to cups at 6–12 months of age • Generally consistent in recommending that milk should be served to toddlers in a cup
Safety of foods and feeding practices	• Consistent in recommending that milk, milk products, and juice given to children should be pasteurized • Consistent in recommending against giving honey to children under 1 year of age due to risk of botulism • Generally consistent in recommending against consumption of raw or undercooked eggs • Consistent in advising about choking hazards, although examples provided varied across guideline documents • Consistent in recommending that infants and young children be supervised while eating
Introduction of complementary foods	• Generally consistent in recommending that complementary foods not be introduced before 4 months of age nor delayed to after 6 months of age • Not consistent in whether the recommended age of introduction is an age range (4–6 months) or is focused on introduction at (approximately) 6 months • Consistent in recommending that the first foods offered to infants be iron rich or iron fortified • Consistent in recommending gradual introduction of new foods
Food consistency and texture	• Consistent in recommending that food consistency and texture be tailored to the developmental needs of the child • Consistent in recommending that consistencies and textures of foods offered should change as the child gets older
Meal frequency	• Generally consistent in recommending that a consistent meal schedule be established • Generally consistent in recommending that young children need several eating occasions, both meals and snacks, over the course of the day

continued

TABLE S-3 Continued

Topic Area	Summary of Consistency Across Recommendations
Hunger and satiety cues	• Generally consistent in emphasizing the importance of using hunger and satiety cues to guide infant and child feeding
Responsive feeding	• Generally consistent in recommending that the feeding environment be pleasant and include nurturing behaviors (e.g., verbalization, eye-to-eye contact, not forcing the child to eat) • Consistent in recommending that repeated exposure is needed for children to accept new foods • Generally consistent in recommending that self-feeding and self-regulation be encouraged in infants and toddlers

NOTE: The committee uses the following phrases to describe consistency of recommendations:
- *Consistent* indicates alignment across the recommendations.
- *Generally consistent* indicates that the recommendations tended to provide similar guidance, although there were some differences in details or wording.
- *Some inconsistencies* indicates mixed recommendations, some of which align.
- *Not consistent* indicates recommendations providing different guidance on a topic.

COMMUNICATION AND DISSEMINATION OF FEEDING RECOMMENDATIONS

The feeding guideline documents reviewed by the committee generally did not describe complex, multisector implementation strategies. Accordingly, the committee focused on information contained within the guideline documents related to changing knowledge, attitudes, and/or behaviors, and the channels by which to spread feeding guidance. Of the 43 eligible guideline documents the committee reviewed, 25 included a statement or section related to communicating or disseminating the feeding recommendations. Most of the guideline documents the committee reviewed were specifically developed for one or more target audiences, with a large majority aimed at health care providers (e.g., physicians, nurse practitioners, nurses, dentists, registered dietitian nutritionists, and other nutrition professionals). Other target audiences included parents and guardians, early care and education providers, program administrators, and policy makers. Communication and dissemination approaches were varied across these different target audiences:

- Health care providers: The guideline documents primarily focused on the health care provider as a critical nexus for guiding caregiver practices. The guideline documents encouraged practitioners to promote awareness, changes in attitudes and knowledge, and adoption of recommendations, and to engage in advocacy.
- Parents and guardians: Although the importance of providing parents and guardians with specific feeding guidance was acknowl-

edged, these groups were infrequently the target audience for the guideline documents reviewed. A host of online resources is available to parents and guardians, but these materials are sometimes inconsistent in directly mapping back to a guideline document.

- Early care and education providers: Despite being integral players in infant and young child feeding, early care and education providers were often not the target audience of the guideline documents the committee reviewed. The committee notes that, in the United States, this stakeholder group has a key publication that provides national health and safety performance standards, referred to as *Caring for Our Children*. One of the standards included relates to nutrition and draws on feeding recommendations from authoritative organizations.
- Program administrators: Program administrators were also not a primary target audience for most of the included guideline documents. The Child and Adult Care Food Program and the Special Supplemental Nutrition Program for Women, Infants, and Children are two key federal programs in the United States that integrate feeding recommendations into practice. Although the committee did not find an eligible guideline document from or for these programs, it did identify recent key resources that translated feeding recommendations, national policy, and federal regulations into programmatic guidance.
- Policy makers: Some of the guideline documents reviewed included recommendations targeting policy makers. The level of detail provided for this target audience varied. For instance, one organization expressed strong support for national policies and legislation related to the feeding recommendations, whereas another guideline document provided explicit guidance to the government.

The guideline documents the committee reviewed were limited in their descriptions of best practices or approaches to communication and dissemination of the feeding recommendations. There is a need to better understand effective communication and dissemination techniques for each of the target audiences, with special consideration of issues of equity, especially in light of an increasing recognition of the association between social determinants of health and persistently observed health disparities, the changing landscape of mobile health devices and applications, and the role of social networks in influencing knowledge, attitudes, and behaviors.

CONCLUSIONS AND FUTURE DIRECTIONS

Across the 26 topic areas related to *what to feed* and *how to feed* infants and young children, the committee found that many of the recommendations from the various organizations were consistent or generally consistent. When there was inconsistency, it often related to the specific ages or age ranges stated in the recommendation. Although the committee found considerable variability in the wording of recommendations, in many cases, the differences in wording were subtle.

Overall, recommendations often mapped to narrative reviews. Within most of the themes, at least one of the recommendations for that theme mapped to a systematic review. For some themes, the committee was unable to map a few of the recommendations to the evidence, and for others, the guideline document indicated that there was little or no evidence to support a recommendation. In almost all cases, the body of evidence for a given recommendation was not formally graded.

As many organizations had recommendations on the same topics, and many recommendations were generally consistent, there is substantial potential for harmonization using a collaborative approach. Collaboration on feeding guidelines, starting at the development phase and continuing through the dissemination phase, is likely to facilitate the harmonization of guidance. Harmonization of the process for developing feeding guidelines does not necessarily imply that the specific feeding recommendations need to be exactly the same across countries, communities, and professional organizations. In fact, the need to customize guidance for particular target audiences and contexts means that some of the wording of recommendations may vary, especially in the dissemination and communication products.

Harmonizing the Development of Future Feeding Guidelines

Across the collection of guideline documents reviewed, the committee identified a range of methodological approaches taken to develop feeding recommendations. This heterogeneity has implications for the consistency and quality of guideline documents, and it underscores the need to consider ways to harmonize the process. Based on its review and comparison of feeding recommendations, along with its collective expertise, the committee offers insight to help align and improve future guidelines.

Preparing to Develop the Guidelines

When developing feeding guidelines, there are several potential advantages of using a collaborative approach that involves multiple organizations

from the start of the process. If a formal systematic review of the evidence is to be conducted, this process can be centralized so that all of the organizations or a consortium of organizations make use of the resulting review, potentially enhancing both quality and efficiency. Collaboration between organizations can also facilitate development of uniform standards for quality guidelines, avoid duplication of effort in generating recommendations, and establish consensus across organizations. Including key stakeholders, communication experts, and representatives of the target audience at the beginning stages can help to ensure that the final product is appropriately designed and disseminated.

Developing the Guidelines

Published criteria on developing high-quality guidelines stipulate that a range of best practices related to the guideline development process, review, and dissemination be consistently considered during each step and specified in the guideline document. Within the guideline document, recommendations need to be identifiable, specific, unambiguous, and explicitly linked to supporting evidence.

Planning for Dissemination and Implementation of Guidelines

Timely and effective dissemination of evidence-based recommendations is critical to bridge the practice chasm and improve feeding practices and health and developmental outcomes for infants and young children. Effective strategies are needed to support communication and dissemination of feeding guidance, and to promote the systematic uptake of guidelines.

Incorporating principles of dissemination and implementation (D&I) science may speed up the translation and application of recommendations. By identifying key influences on the adoption, implementation, and sustainability of interventions, D&I science provides vital information about how, when, by whom, and under what circumstances evidence spreads, both within or by organizations, and affects the intended population. Documenting any adaptations that are made in response to the local context and target audience can guide future D&I efforts for feeding guidelines, taking equity principles into account.

Thus, the committee recommends that agencies, organizations, and groups developing guideline documents related to feeding infants and young children should consider the principles of dissemination and implementation science as a means to enhance the reach and impact of the feeding recommendations that are developed.

CONCLUDING REMARKS

In spite of all of the differences in the ways that guideline documents were developed, it is encouraging that there was consistency for the majority of recommendations across a variety of authoritative organizations. For the future, it is important to harmonize the process across organizations and to use more rigorous methods for developing, communicating, and disseminating recommendations for feeding infants and children from birth to 24 months of age.

1

Introduction

Every day, people make decisions about what and how to feed infants and young children. To inform these decisions, parents, health care providers, and others have a wide array of advice publicly available to them, ranging from social media posts to position statements by authoritative groups. Even when guidance comes from authoritative groups, including government, professional, and nonprofit organizations and agencies, there can be inconsistencies in advice owing to differences in approaches taken to develop feeding recommendations. Little information exists on the breadth and consistency of current guidelines for feeding children under 2 years of age, as well as the type of evidence that is used to support specific recommendations. The aim of this report is to compare and summarize existing feeding recommendations for this age group, document the type of evidence used to support each recommendation, and examine if and how existing guideline documents describe approaches to communication and dissemination of the feeding recommendations.

IMPORTANCE OF FEEDING PRACTICES FOR CHILDREN UNDER 2 YEARS OF AGE

Infant feeding practices have important short- and long-term consequences. Breastfeeding practices are associated with the health and development of the young child (Koletzko et al., 2019), may alter the risk for chronic disease later in life (Gungor et al., 2019; Horta et al., 2015), and influence maternal health outcomes such as breast cancer and type 2 diabetes (Chowdhury et al., 2015). The timing of introduction and the types and amounts of

solid foods and beverages provided to the infant, including infant formula, may also influence child growth, development, and various health outcomes (English et al., 2019; Obbagy et al., 2019). In addition, the way in which infants and young children are fed, such as responsive feeding practices that are sensitive to hunger and satiety cues (Hohman et al., 2016; Hurley et al., 2011; Spill et al., 2019), can influence child weight status and the development of healthy eating behaviors. Children establish food preferences early in life, which may have a significant effect on dietary intake in childhood as well as later in life. There is growing evidence that the first 1,000 days, from conception to 2 years of age, influence long-term health and development (Darling et al., 2020); optimal nutrition of infants and young children is an essential component of building this foundation for a healthy and productive life.

CHALLENGES OF UNDERSTANDING WHAT AND HOW TO FEED INFANTS AND YOUNG CHILDREN

Recommendations for feeding infants and young children have changed substantially in the United States in the past century because of scientific advances, cultural influences, societal trends, and other factors. More recently, more robust approaches to reviewing and synthesizing scientific evidence have evolved, such that there are now established protocols with which to develop evidence-based recommendations and guidelines (IOM, 2011; Kredo et al., 2016; Qaseem et al., 2012; Schünemann et al., 2014; WHO, 2012). To date, however, not all authoritative organizations have used such approaches for developing feeding guidance. In addition, although scientific research on feeding infants and toddlers has expanded during this period, for many feeding questions there is little or no evidence available to guide best practices, meaning that guideline developers must rely instead on expert or consensus opinion. As a result, currently available recommendations on early-life feeding can vary, leading to mixed messaging and making it more difficult for parents and health care providers to make well-informed choices on feeding children under 2 years of age.

RECENT EFFORTS AND WORK ON FEEDING GUIDANCE FROM BIRTH TO 24 MONTHS

Within the past decade, several countries, including the United States, have expanded efforts to develop scientifically based guidance for feeding infants and young children under 2 years of age. In the United States, the *Dietary Guidelines for Americans* (DGA) for 2020–2025 will, for the first time, include guidelines for this age group. Several steps were taken in preparation for this. In 2012, the U.S. Department of Agriculture and the U.S. Department of Health and Human Services initiated the B-24 Project, which

subsequently expanded in 2014 to also include pregnant women and was renamed the Pregnancy and Birth to 24 Months Project, or the P/B-24 Project. That project was designed to examine diet-related topics of public health importance for pregnant women and infants and toddlers from birth to 24 months of age and to conduct a number of systematic reviews. Those reviews were published in 2019 (Stoody et al., 2019), and have been incorporated into the work of the 2020 Dietary Guidelines Advisory Committee (DGAC) (DGA, 2020).

It should be noted that, owing to time constraints, the topics addressed by the 2020 DGAC focus mostly on *what to feed* rather than *how to feed*. In addition to the DGA process, other organizations in the United States have been working to update and expand guidance on feeding children from birth to 24 months. For example, the American Academy of Pediatrics published updated guidance in a revised version of *Pediatric Nutrition* in 2019 (AAP Committee on Nutrition, 2019), and the Robert Wood Johnson Foundation recently published two relevant reports (Lott et al., 2019; Pérez-Escamilla et al., 2017). In several other high-income countries, including Australia, Canada, New Zealand, and the United Kingdom, comprehensive guidance on infant and young child feeding has been developed within the past few years. At the global level, the World Health Organization is currently implementing a process to update guiding principles on complementary feeding (WHO, 2019).

THE COMMITTEE'S TASK AND APPROACH

This report seeks to describe the consistency of existing feeding recommendations for infants and young children, to document the type of evidence for existing recommendations, and to provide recommendations about strategies to communicate and disseminate such guidance.

As directed by the Statement of Task, the committee reviewed and assessed publicly available guidance on feeding practices for infants and children up to 2 years of age (see Box 1-1). To meet this task, the committee identified and collected guidance documents on *what to feed* and *how to feed* from government agencies and from authoritative domestic and international organizations, including governmental and nongovernmental sources. The committee then evaluated each included guidance document and compiled a comprehensive list of the topics that were addressed and the recommendations made on those topics across organizations. The committee summarized the level of agreement or consistency of the recommended practices across the documents. The committee also documented the type of evidence that was used as the basis for each of the recommendations on infant and young child feeding. The guideline documents were examined for descriptions of strategies to support the communication and dissemination of the recommended infant and young child feeding guidance.

BOX 1-1
Statement of Task

An ad hoc committee under the auspices of the National Academies of Sciences, Engineering, and Medicine will be convened to review and assess publicly available guidance on feeding practices for infants and children up to 2 years of age. The committee will:

- Identify and collect public-facing documents and resources about *what to feed* and *how to feed* infants and children from birth up to 2 years of age. The scope of resources will include domestic sources, such as guidance from federal agencies in the United States and Canada; authoritative organizations, such as the American Academy of Pediatrics and the Robert Wood Johnson Foundation; and international sources, including but not limited to the World Health Organization.
- Compile a comprehensive list of the topics addressed in the documents collected, along with the type of evidence cited in support of each topic.
- Note the basis for the recommended feeding practices by each source, describe the level of agreement between sources, and assess differences between the guidance documents.
- Assess the documents for descriptions of "best practices" as well as for implementation strategies to support communication and dissemination of feeding guidance.

The committee will produce a report that includes a comparison of the guidance documents reviewed with documentation of the type and strength of evidence underpinning each guideline. The report will inform stakeholders about the feasibility of consolidating feeding guidelines and/or harmonizing guidance across sources of advice for *what* and *how* to feed infants and children up to 2 years of age, and will make recommendations about communication strategies to the stakeholder community.

Intended Audience

The primary intended audiences for this report are governmental and nongovernmental agencies, organizations, and groups who develop or are planning to develop feeding recommendations for infants and young children. Findings related to the consistency of existing guidance may shed light on the potential for harmonization of recommendations across different entities. Similarly, the descriptions of the types of evidence used to support each recommendation provide insight into the methods used to develop existing guidelines and the state of the science on what and how to feed infants and young children. This information, in turn, may highlight evidence gaps and inform research agendas. Additionally, approaches to communicating and disseminating feeding recommendations are explored, and

may provide insight for those who develop and test strategies to enhance reach and effectiveness of guideline documents.

This report may also be of value to the broader community of stakeholders who are invested in the health, well-being, and development of infants and young children. These groups may include, but are not limited to, health care providers (e.g., physicians, nurse practitioners, nurses, dentists, registered dietitian nutritionists, and other nutrition professionals), parents and guardians, early care and education providers, program administrators, and policy makers.

Scope of the Report

Countless websites, videos, magazines, handouts, reports, forums, social media platforms, and other resources provide advice about what and how to feed infants and young children. The vast and ever-changing landscape of where and what information can be accessed makes cataloging the totality of guidance that exists on these topics an insurmountable task. The aim of this report is not to be exhaustive in its search, but rather to identify and compare guidelines from authoritative domestic and international government, professional, and nonprofit organizations and agencies. The recommendations summarized are applicable to infants and young children from birth to 24 months of age. The phrases *birth to 24 months*, *infants and children under 2 years*, and *infants and children up to age 2 years* are used interchangeably throughout.

Recognizing that differences in the applicable population for guideline documents could lead to apparent inconsistencies across recommendations, the committee limited its search for international sources to broad, global guidance and to guideline documents from high-income countries. The health, food safety, and resource issues in lower-income countries differ substantially from those in high-income countries, which has implications for feeding recommendations. The committee interpreted the Statement of Task concept of "public-facing" as meaning the resources for the general public that are readily accessible online. Searches, screening, and selection of guideline documents focused on those that provided recommendations for healthy mother–infant dyads. The committee acknowledges that there are a host of topics and population groups (e.g., middle- and low-income countries, premature infants) that are of interest to the field that could not be addressed in this scoping study, and it views this report as providing a foundation for future scoping reviews of other types of feeding guidelines.

With respect to the review of best practices and implementation strategies for communication and dissemination, the committee interpreted its task as being focused on information provided within the guideline documents it reviewed. A comprehensive evaluation and exploration of models,

theories, and examples of communication and dissemination strategies beyond the information provided in the guideline documents would be valuable but was considered outside of the committee's charge.

ORGANIZATION OF THE REPORT

This introductory chapter describes the importance of feeding practices and the challenges of understanding what and how to feed children under 2 years of age, the committee's task and approach, and the aim of the report. The methodology that the committee used to identify and compare guideline documents is detailed in Chapter 2. Chapter 3 presents the characteristics of the guideline documents that met the eligibility criteria described in Chapter 2. The next two chapters provide the committee's review of the recommendations related to what (Chapter 4) and how (Chapter 5) to feed infants and young children from the included guideline documents. Each of these chapters contains a summary table on the consistency of the recommendations. Chapter 6 discusses the communication and dissemination of feeding recommendations. Chapter 7 summarizes the consistency of existing feeding recommendations and offers suggestions for the development of future guidelines. Appendix A is a collection of the guideline documents that were excluded from the review based on the eligibility criteria. Appendix B is a series of tables that provide all of the recommendations that were abstracted from the included guideline documents. Biographical sketches of the committee members are found in Appendix C.

2

Methodology

Chapter Highlights

- Given that there is no single repository of feeding guideline documents and many guideline documents exist in the gray literature, a multipronged targeted search approach supplemented with expert input was used.
- The committee selected guideline documents relevant to healthy mother–infant dyads in high-income countries.
- Resources that include feeding recommendations have a wide range of formats, which sometimes made it challenging to determine the original source of the guidance.
- The committee's approach to describing communication and dissemination strategies primarily focused on the information provided within the guideline documents themselves, supplemented with exploratory scans for feeding guideline communication and dissemination materials.

The landscape of feeding recommendations is vast and heterogeneous. Identifying and characterizing all feeding guidance that exists for infants and young children, both nationally and globally, is not feasible. To that end, the committee sought to explore current guideline documents from government agencies and from authoritative professional and nonprofit organizations, with a focus on guidance relevant to healthy mother–infant

dyads in high-income countries (for rationale, see Chapter 1). The sections that follow provide an overview of the process the committee undertook to identify and compare the collection of guideline documents referenced throughout the remainder of the report.

SEARCHES FOR GUIDELINE DOCUMENTS

To identify potentially relevant documents, the committee conducted searches as outlined in Figure 2-1 and described in detail below. Searches were intended to be broadly inclusive of any materials that contained feeding recommendations for healthy, term infants and young children from birth to 24 months, relevant to high-income countries. The committee did not establish any other criteria for the guideline materials during the initial searches.

Targeted Website Searches

Recognizing that guideline documents and resources likely exist in the gray literature and may not be cataloged in databases, the primary approach for identifying guideline documents consisted of targeted website searches. The committee first created a list of potentially relevant government agencies, professional organizations, nonprofit organizations, and international groups. Using a snowball search approach, other agencies and organizations were added to the list when, over the course of a targeted website search, they were noted as a source of additional information. Agencies, groups, and organizations that ultimately did not qualify as authoritative were still searched, as their websites often provided links to primary guideline documents and resources within and beyond their organizations.

Website searches began on the homepage for each organization. The search strategy depended on the website structure; dropdown menus, topic area groupings, and document search options were used to find potentially relevant guideline documents. Staff conducted targeted website searches during the last 2 weeks of November 2019. Given resource constraints, duplicate searches were only conducted when the first search did not yield any results. The committee acknowledges that this approach may have led to the inadvertent omission of some eligible documents. The other search approaches (i.e., food-based dietary guideline search, expert input, and database searches) were intended to supplement the targeted website searches, and help to fill in potential gaps.

Food-Based Dietary Guideline Search

The Food and Agriculture Organization of the United Nations maintains a website that catalogs national food-based dietary guidelines and

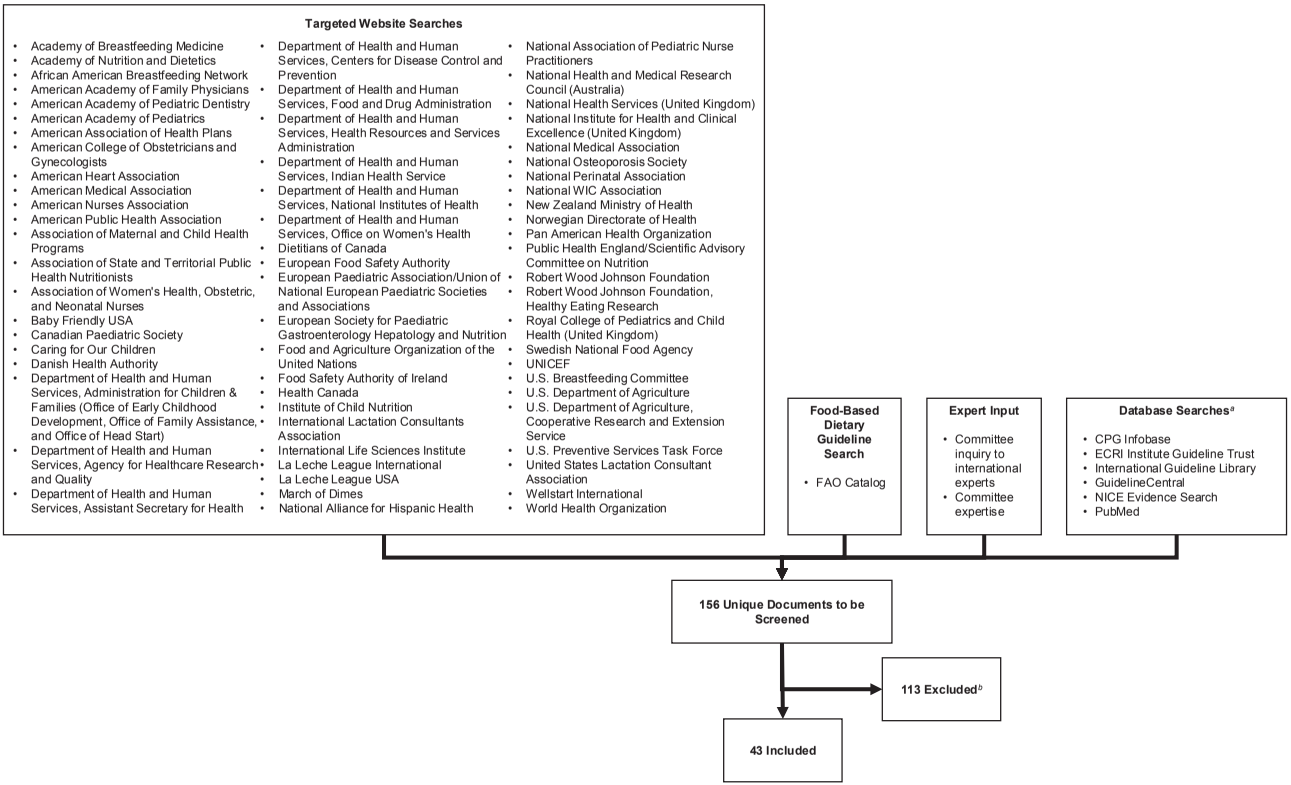

FIGURE 2-1 Flow diagram of guideline document search and screening process.

NOTE: CPG = clinical practice guideline; FAO = Food and Agriculture Organization of the United Nations; NICE = National Institute for Health and Care Excellence; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

[a] Databases selected either focused exclusively on guideline documents or included a filter that could limit the search to guideline documents.

[b] Excluded documents are listed in Appendix A.

food guides (FAO, 2019). This catalog was used to search for English-language documents from high-income countries that included feeding recommendations relevant to infants and young children. National food-based dietary guidelines and related resources from eight countries were included for screening (see Figure 2-2).

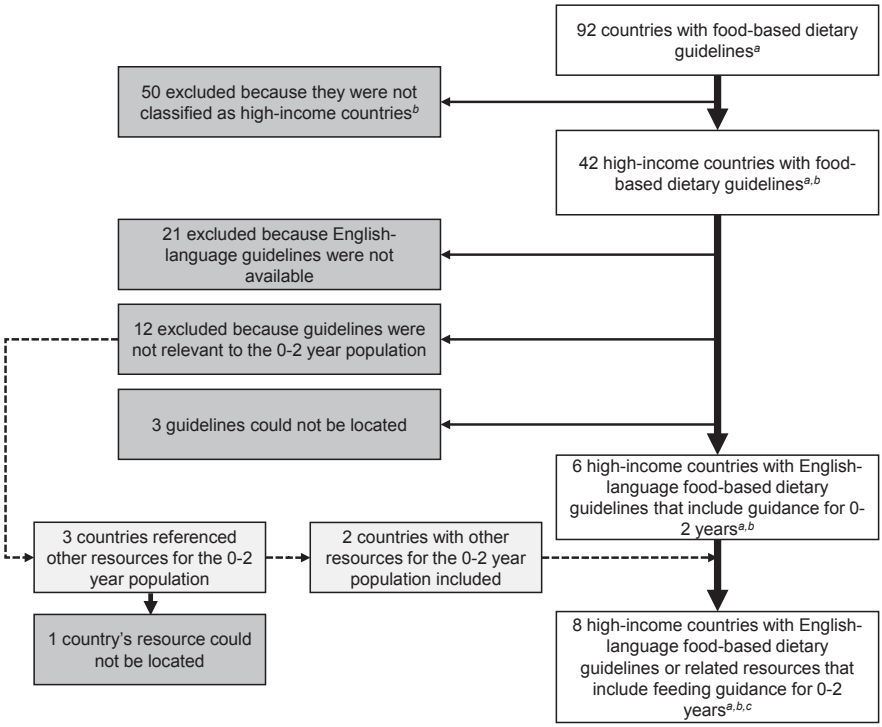

FIGURE 2-2 Flow diagram of how the Food and Agriculture Organization of the United Nations' catalog of national food-based guidelines was used to identify potentially relevant guideline documents.

[a] As cataloged by the Food and Agriculture Organization of the United Nations (www.fao.org/nutrition/education/food-dietary-guidelines/home/en; accessed November 8, 2019).

[b] Countries' income levels classified using the fiscal year 2020 World Bank classification (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups; accessed November 8, 2019).

[c] The eight high-income countries with documents included for screening were Antigua and Barbuda; Australia; the Bahamas; Canada; Greece; New Zealand; Qatar; and Sweden. Not all eight were eligible after document screening.

Expert Input

Members of the committee contacted international experts about English-language versions of national feeding guideline documents and supporting materials from Denmark, Germany, Italy, and Norway. Documents available in English were included in the committee's screening process. The committee also took advantage of its expertise to identify potentially relevant resources not identified through other search approaches.

Database Searches

As an adjunct to its targeted website searches, the following databases were used to search for relevant guideline documents: CPG Infobase, ECRI Institute Guideline Trust, International Guideline Library, GuidelineCentral, NICE Evidence Search, and PubMed. The search strategy was developed with the assistance of a senior librarian and was carried out by staff (see Table 2-1). Filters were used for language, publication type, age group, and publication date as available within each database. Searches included documents published through the first week of December 2019. Title and abstract screening from these searches was not conducted in duplicate owing to resource limitations. The committee acknowledges that this approach may have led to the inadvertent omission of some eligible documents.

TABLE 2-1 Summary of Database Searches

Name	Selected Filters	Search Term	Number of Results	Number Included for Screening[a]
CPG Infobase: Clinical Practice Guidelines[b]	• Language: English	nutrition*	16	5
		diet*	26	5
		infant*	48	5
		baby OR babies	0	0
		toddler*	0	0
		feeding	14	4
		"breast milk" OR breastmilk	30	4
		breastfeed* OR breastfed* OR "breast feed*" OR "breast fed*"	0	0

continued

TABLE 2-1 Continued

Name	Selected Filters	Search Term	Number of Results	Number Included for Screening[a]
ECRI Institute Guideline Trust[c]	• Clinical area: nutrition • Patient age: infant, newborn (to 1 month); infant (1 to 23 months)	nutrition*	9	3
		diet*	2	0
		infant*	6	2
		baby OR babies	8	0
		toddler*	0	0
		feeding	6	2
		"breast milk" OR breastmilk	2	2
		breastfeed* OR breastfed* OR "breast feed*" OR "breast fed*"	6	2
International Guideline Library[d]	• Language: English • Publication: guideline • Publication status: published	nutrition*	106	3
		diet*	38	0
		infant*	23	1
		baby OR babies	4	0
		toddler*	0	0
		feeding	5	1
		"breast milk" OR breastmilk	1	0
		breastfeed* OR breastfed* OR "breast feed*" OR "breast fed*"	9	2
GuidelineCentral[e]	• Search: guideline summaries, title field	nutrition	29	0
		nutritional	5	0
		diet	6	0
		dietary	1	0
		diets	0	0
		infant	16	0
		infants	12	0
		babies	1	0
		baby	0	0
		toddler	0	0
		toddlers	0	0
		feeding	8	0
		"breast milk"	0	0
		breastmilk	0	0
		breastfeeding	6	1
		"breast feeding"	0	0
		breastfed	1	0
		"breast fed"	0	0

TABLE 2-1 Continued

Name	Selected Filters	Search Term	Number of Results	Number Included for Screening[a]
NICE evidence search[f,g]	• Evidence type: guidance • Date: January 1, 2000, forward	"infant feeding"	91	16
		"breast milk" OR breastmilk	254	14
		breastfeed* OR breastfed* OR "breast feed*" OR "breast fed*"	631	18
		"complementary feeding"	27	9
		"child nutrition" OR "infant nutrition"	62	11
PubMed[g,h]	• Article type: practice guideline • Language: English • Date: January 1, 2000, forward	"infant feeding"	19	2
		"breast milk" or breastmilk	18	4
		breastfeeding OR "breast feeding" OR breastfeed OR "breast feed" OR breastfed OR "breast fed" OR "Breast Feeding"[Mesh]	222	12
		"complementary feeding" OR "Infant Nutritional Physiological Phenomena"[Mesh]	166	15
		"child nutrition" OR "infant nutrition"	27	4

NOTE: Searches included documents published through the first week of December 2019.

[a] Values in this column have not been deduplicated across searches. Because the total number of documents screened came from database searches, a search of food-based dietary guidelines, expert input, and targeted website searches, the cumulative total in the right-hand column does not correspond to the numbers presented in Figure 2-1.

[b] CPG Infobase: Clinical Practice Guidelines available at https://joulecma.ca/cpg/homepage (accessed May 20, 2020).

[c] ECRI Institute Guideline Trust available at https://guidelines.ecri.org (accessed May 20, 2020).

[d] International Guideline Library available at https://g-i-n.net/library/international-guidelines-library/international-guidelines-library (accessed May 20, 2020).

[e] GuidelineCentral available at https://www.guidelinecentral.com/summaries (accessed May 20, 2020).

[f] NICE evidence search available at https://www.evidence.nhs.uk (accessed May 20, 2020).

[g] Given the volume of results returned, the committee adapted the search terms so the search was not too broad in scope (e.g., *nutrition*) and so the results were relevant to the committee's task.

[h] PubMed available at https://www.ncbi.nlm.nih.gov/pubmed (accessed May 20, 2020).

ELIGIBILITY CRITERIA

Documents and resources identified through the various searches were screened for eligibility. Screening began at the document level, to ensure the materials were relevant to the committee's interpretation of its charge. As documents were screened, the committee recognized that some documents contained a mixture of eligible and out-of-scope recommendations, particularly in documents that were comprehensive in nature. To that end, recommendation-level criteria were applied to ensure that only relevant feeding recommendations were abstracted. A subset of committee members conducted the first round of document screenings, discussing and agreeing upon the rationale for inclusion or exclusion of each document. Document eligibility that could not be determined by the subgroup was resolved through committee discussion.

Document-Level Eligibility Criteria

Eligibility criteria used to screen the identified guideline documents are presented in Table 2-2. Screening focused on whether or not the identified document contained any recommendations on what or how to feed infants and children younger than 2 years of age; feeding recommendations encompassed human milk, infant formula, other foods and beverages, and supplements. Guideline documents that included a summary of the state of science in an attempt to make recommendations, but which found inadequate evidence to do so, were considered eligible. Given the committee's charge of reviewing "public-facing" guidelines, eligible documents were readily accessible on the Internet. As noted previously, the committee's search, screening, and selection focused on guideline documents relevant to healthy mother–infant dyads in the general population of high-income countries. Guideline documents specific to preterm infants were excluded owing to challenges of drawing comparisons (e.g., related to the "age" of the infant) and the special considerations related to medical management.

Recommendation-Level Eligibility Criteria

Guideline documents that screened eligible differed in span and scope. While some focused on a specific topic (e.g., vitamin D supplementation), others provided extensive guidance on a wide range of topics. To identify a collection of feeding recommendations that could be compared for consistency, the committee established recommendation-level eligibility criteria (see Table 2-3).

TABLE 2-2 Guideline Document-Level Eligibility Criteria

Inclusion Criteria	Exclusion Criteria
• The most current recommendations or guidelines from authoritative agencies and organizations • Documents that provided guidance related to what or how to feed human milk, infant formula, other foods and beverages, and supplements to infants and children younger than 24 months of age[a] • Includes guidance relevant to high-income countries[b] • Includes general guidance for the healthy mother–infant dyad, without consideration of modifying adverse clinical health conditions • Readily available on the Internet	• Documents that exclusively provide feeding recommendations for preterm infants • Clinical treatment guidelines for a specific disease or condition • Guideline documents from, for, funded by, or in collaboration with industry • Documents that exclusively provide guidance related to clinical management of lactation • Position statements that only support or describe the benefits of breastfeeding without providing additional recommendations about how to feed (e.g., duration, frequency) • Position statements that only recommend methods for preparing and storing foods, including breast milk and formula • Guidance for establishing or operating donor milk banks • Documents providing guidance related to malnutrition or emergency situations • Guidance relevant to the intake of breastfeeding mothers • Documents about infant formula composition • Documents that have the primary purpose of being a communication or dissemination tool (e.g., training manual, pamphlets) • Documents published before 2000 • Documents not available in English

[a] Summaries of the state of science in an attempt to make recommendations, but which found inadequate evidence to do so, were considered eligible.

[b] Countries' income levels classified using the fiscal year 2020 World Bank classification (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups; accessed November 8, 2019).

Challenges Encountered During Screening

Guidelines and their underlying evidence base exist in a wide range of formats. Government agencies, for instance, may publish a set of public-facing guideline documents informed by a separate scientific report. Professional organizations often publish position papers, policy statements, or practice papers or guidelines accompanied by a narrative review. Other organizations may release guideline reports with different structures and content. The format, terminology, target audience, and approach to developing guideline documents may also change over time within an organization.

Even with detailed eligibility criteria, screening the identified materials was not straightforward. As the committee's charge was to not only com-

TABLE 2-3 Recommendation-Level Eligibility Criteria

Inclusion Criteria	Exclusion Criteria
• Recommendations that provide guidance related to what and/or how to feed human milk, infant formula, other foods and beverages, and supplements to infants and children younger than 24 months of age[a]	• Recommendations on topics listed in the document-level exclusion criteria[b] • Dietary Reference Intake or other dietary reference values for individual nutrients • Recommendations related to peanut allergy prevention that were prepared or published before the release of the LEAP trial[c]

NOTE: LEAP = Learning Early About Peanut Allergy.

[a] Recommendations may include the primary prevention of food allergies and other common conditions (e.g., diarrhea, constipation, dental caries). However, recommendations on the treatment of a condition were excluded.

[b] Recommendations were excluded if they were about preterm infants; clinical treatment of a specific disease or condition; clinical management of lactation; the benefits of breastfeeding; methods for preparing and storing foods, including breast milk and formula; malnutrition or emergency situations; intake of breastfeeding mothers; or infant formula composition.

[c] Many agencies, organizations, and groups used the LEAP trial (Du Toit et al., 2015) to update feeding guidelines related to the primary prevention of peanut allergy. Inclusion of peanut allergy–related recommendations predating the release of the LEAP trial results would unnecessarily introduce inconsistency and those earlier recommendations were therefore excluded.

pare the consistency of guidance but also to document the type of evidence used to support each recommendation, it was imperative to find the source document of the feeding recommendations. One substantial challenge the committee faced was determining what constituted guideline documents and resources, as opposed to communication or dissemination materials. Communication materials typically include lay-friendly feeding guidance, but do not typically provide the methodological or scientific underpinning of each recommendation. Although these types of materials often provide specific feeding recommendations, the committee did not consider these resources to be eligible guideline documents. The dividing line between a guideline document and a communication product, however, is not clear-cut, and the determination is somewhat subjective. Although not a formal criterion, the committee considered whether the document provided information about the guideline development process or evidence supporting the recommendation, rather than being a simple, lay-friendly resource, in distinguishing between guidelines and communication materials.

A major resource that provides guidance on feeding infants and young children is the American Academy of Pediatrics' *Pediatric Nutrition* (AAP Committee on Nutrition, 2019). This comprehensive book includes a number of sections related to what and how to feed young children. Despite its preeminence, this handbook was determined not to meet the committee's eligibil-

ity criteria because the guidance in the book is intended to align with current AAP policy statements. Accordingly, the policy statements were considered the origin document of the recommendations. The committee acknowledges the importance of this resource to the field, but has opted to include and abstract policy and clinical practice position statements from AAP.

Even scientifically oriented documents with clear statements of guidance on what or how to feed infants and young children posed challenges. For example, in its 2019 report, *Appropriate Age Range for Introduction of Complementary Feeding into an Infant's Diet*, the European Food Safety Authority Panel on Nutrition, Novel Foods and Food Allergens noted that the purpose of the document was to assess the scientific evidence, and that providing public health recommendations was considered out of scope (EFSA Panel on Nutrition, Novel Foods and Food Allergens, 2019). Nevertheless, the document provides clear statements of when to introduce complementary foods into infants' diets and was ultimately considered eligible. In another example, the Academy of Breastfeeding Medicine published a protocol related to supplementary feedings for healthy, term breastfed newborns (Kellams et al., 2017). This guideline document provided guidance related to what and how to feed infants; however, the document was ultimately excluded because the recommendations were focused on clinical management and did not align with the committee's interpretation of its charge.

Another challenge the committee encountered was assessing documents consistently, despite inconsistent formats. For instance, the Australian government has a suite of publications including the guideline document, the supporting literature review, public consultation on the feeding guideline document, and a summary of the recommendations (NHMRC, 2012). Taken in isolation, the guideline document does not provide the full context of the scientific review supporting each recommendation. Accordingly, when guideline documents were supported by a separate literature search or documentation of the evidence, the committee considered these publications collectively, as necessary. Some guidelines from international groups and organizations had an English guideline document or summaries, but the corresponding evidence base was not available in English (Bührer et al., 2014; Davanzo et al., 2015). These documents were ultimately excluded because the committee could not determine the type of evidence underlying the feeding recommendations. The heterogeneous formats of guidelines and associated evidence reviews posed challenges in identifying and assessing the documents in a systematic and consistent way.

ABSTRACTED INFORMATION

Although the primary focus of the committee's work was the feeding recommendations and supporting evidence, some of the information needed

to contextualize the feeding recommendations could be abstracted at the document level. The committee therefore abstracted information at the document level and at the recommendation level.

Document-Level Abstraction

The following information was abstracted from each of the eligible guideline documents and resources:

- Organization(s)—The agencies, organizations, or groups that published, released, or otherwise directly participated in the development of the guideline document were recorded.
- Year—The year the guideline was published or otherwise updated was recorded.
- Target country or region, as specified in the guideline document—Unless otherwise stated, it was assumed that professional organization guidelines were for the country or region specified in the organization's name (e.g., the target region for a guideline document from the European Society for Paediatric Gastroenterology, Hepatology and Nutrition was Europe).
- Target audience of the document, as specified in the guideline document—Document target audiences may include, but are not limited to, health care providers (e.g., physicians, nurse practitioners, nurses, dentists, registered dietitian nutritionists, and other nutritional professionals), parents and guardians, early care and education providers, program administrators, and policy makers.
- Inclusion of conflict-of-interest statement for guideline authors—This included any statement about the guideline authors' potential conflicts.
- Guideline development methodology—If available, the statement of methods for arriving at the recommendations was recorded as described in the document.
- Inclusion of guidance on communication and dissemination—The abstractor made note of any guidance contained within each eligible document related to changing knowledge, attitudes, and/or behaviors, and the channels by which to spread feeding guidance.
- Inclusion of research recommendations—The abstractor noted when a guideline document included a specific section or statement of research recommendations, future work, knowledge gaps, future research needs, or similar text. The content of those research recommendations, however, was not abstracted.

Recommendation-Level Abstraction

The committee sought to capture the following information about each eligible recommendation:

- Recommendation—The statement of recommendation was recorded verbatim. Statements of recommendation were captured, as presented in the guideline document (e.g., in paragraph form, as a stand-alone sentence, or a statement accompanied by a bulleted list).
- Type of evidence that directly maps to the recommendation—Based only on the information provided in the guideline document itself or, in select cases, in the suite of guideline-related publications, the abstractor noted whether the type of evidence used to support the recommendation could be determined and, if so, what type was used. In an attempt to standardize responses, options for type of evidence included
    - *Systematic review, included as part of the guideline document*: This option was selected when the recommendation could be mapped to a systematic review question included in the guideline document.
    - *Systematic review, specifically prepared for the guideline document, but published elsewhere*: This option was selected when the guideline document was part of a suite of guideline-related publications. This option was not used when a guideline document only cited a systematic review as its evidence within a narrative review of the evidence.
    - *Narrative review, included as part of the guideline document*: This option was selected when the recommendation could be mapped to a section of the guideline document that discussed the evidence in a narrative way, and cited at least two publications (regardless of publication type).
    - *A single citation*: This option was selected when the guideline document stated that the recommendation stemmed from one publication (e.g., a guideline document noting that the recommendation was drawn from a government website). The resource was recorded.
    - *Other*: This option was selected when the type of evidence that mapped to the recommendation did not fall into any of the above categories (e.g., a guideline document noting that the recommendation was informed by reports from other organizations; a guideline document describing recommendations based

on a "systematic literature search" rather than a "systematic review").
    - *Could not be mapped*: This option was selected when the type of evidence used to support the recommendation could not be discerned, and could include instances when no evidence was presented to support a recommendation, or when the link between the evidence and recommendation was unclear.
- System used to determine strength of evidence—The specific system used to evaluate the strength of the evidence (e.g., Agency for Healthcare Research and Quality, Grading of Recommendations Assessment, Development and Evaluation) supporting the recommendation was noted.
- Strength-of-evidence rating—The verbatim word or phrase used to characterize the strength of evidence supporting the recommendation (e.g., *Low*, *Grade B*) was recorded.

IDENTIFYING THE SPAN OF TOPICS COVERED AND CONSISTENCY OF RECOMMENDATIONS

During recommendation-level abstraction, abstractors noted what topic areas each recommendation addressed. The committee used these initial topic area assignments to sort and group the recommendations. Several of the recommendations encompassed multiple topic areas and were considered under each (e.g., a recommendation to "continue breastfeeding while incorporating iron-rich complementary foods" was considered under continuation of breastfeeding, complementary foods, and iron topic areas). Once the recommendations were sorted by topic area, the committee thematically grouped the recommendations and assessed the consistency of the guidance provided for each theme. Consideration was given to the specified age of the infants or young children, the duration and/or timing specified in the recommendations, and other recommendation-specific characteristics. The span of topics and consistency of recommendations are presented in Chapters 4 and 5.

CAPTURING GUIDANCE ON COMMUNICATION AND DISSEMINATION

As part of the document-level abstraction, each guideline document was reviewed for statements, sections, and appendixes providing guidance on who should know about the recommendations, who should communicate that information, and how that information should be communicated. Recognizing that the guidance on communication and dissemination within guideline documents themselves was relatively sparse, the committee

performed two additional exploratory scans. One scan entailed reviewing the materials identified during the document searches that screened ineligible because their primary purpose was to serve as a communication or dissemination tool. The other scan was more exploratory in nature. During the targeted website searches for guideline documents (described above), abstractors noted tools, resources, or materials that accompanied the guideline document or were hyperlinked on the exploratory pathway to the guideline document. This environmental scan was not systematic in nature, but rather was intended to find examples of existing and innovative approaches to communicating and disseminating the feeding recommendations. The committee used this information to inform its understanding of communication and dissemination strategies related to the feeding recommendations that are in use. The committee recognizes that information about communication and dissemination strategies may not be contained in the types of documents and resources reviewed, or may not be publicly available, and recognizes this as a limitation of the exploratory scans that were conducted.

SUMMARY

The committee undertook a multipronged approach to find documents and resources from authoritative agencies, organizations, and groups that provide recommendations on what and how to feed infants and young children. Potentially relevant materials were identified through targeted website searches, food-based dietary guideline searches, expert input, and guideline database searches. A total of 156 unique documents and resources were identified and screened for eligibility. Materials that were included were relevant to healthy mother–infant dyads in high-income countries. Recommendations that were abstracted were related to human milk, infant formula, other foods and beverages, and nutrient supplements. Recommendations were sorted and thematically grouped for comparison. The landscape of guideline documents and supporting evidence were heterogeneous and required some subjectivity, which posed challenges in identifying and assessing the documents in a systematic and consistent way.

3

Characteristics of Included Guideline Documents

Chapter Highlights

- The guideline documents that met the committee's eligibility criteria were heterogeneous in type (e.g., position statement, clinical practice reports), level of collaboration across organizations, scope of topics covered, target audiences, stated methodologies, presentation of recommendations, and mapping of evidence to each recommendation.
- Few guideline documents graded the evidence, and those that did often used different rating systems.
- Differences in stated methodologies across the guideline documents have implications with regard to inconsistencies in the recommendations.
- The heterogeneous presentation of recommendations and their associated evidence led the committee to use a qualitative approach to summarize the consistency of existing guidance.

The committee identified a wide range of potentially relevant documents, webpages, and resources through its multipronged search (see Chapter 2). Of the 156 potentially relevant resources the committee screened using its eligibility criteria, 43 guideline documents were ultimately included. For its review, the committee began by abstracting information about each of the

guideline documents, summarized in Table 3-1. This chapter discusses the characteristics of the guideline documents reviewed and implications for the interpretation of the recommendation summaries presented in Chapters 4 and 5. The list of excluded documents and rationale for exclusion are provided in Appendix A.

TABLE 3-1 Characteristics of Included Guideline Documents

Organization(s)	Citation	Guideline Title	Target Country, Region	Target Audience
AAFP	AAFP, 2014	Position paper on breastfeeding	United States	Health care providers
AAP	AAP Section on Breastfeeding, 2012	Breastfeeding and the use of human milk	United States	Health care providers
	Baker et al., 2010	Diagnosis and prevention of iron deficiency and iron-deficiency anemia in infants and young children (0–3 years of age)	United States	Health care providers
	Baker-Smith et al., 2019	The use of nonnutritive sweeteners in children	United States	Health care providers
	Bhatia et al., 2008	Use of soy protein–based formulas in infant feeding	United States	Health care providers
	Golden et al., 2014	Optimizing bone health in children and adolescents	United States	Health care providers
	Greer et al., 2019	The effects of early nutritional interventions on the development of atopic disease in infants and children: The role of maternal dietary restriction, breastfeeding, hydrolyzed formulas, and timing of introduction of allergenic complementary foods	United States	Health care providers
	Heyman et al., 2017	Fruit juice in infants, children, and adolescents: Current recommendations	United States	Health care providers

Includes Author COIs	Stated Methodology[a]	Evidence Assessment Criteria	Includes Guidance on Communication and/or Dissemination[b]	Includes Research Recommendations
No	Not specified	—	Yes	No
Yes	Not specified	—	Yes	No
Yes	Literature review[c]	—	No	No
Yes	Literature review	—	Yes	Yes
No	Not specified	—	No	No
Yes	Not specified	—	Yes	No
Yes	Literature review	—	No	No
Yes	Not specified	—	Yes	No

continued

TABLE 3-1 Continued

Organization(s)	Citation	Guideline Title	Target Country, Region	Target Audience
AAP; AAPD	AAPD, 2016	Policy on early childhood caries (ECC): Classifications, consequences, and preventive strategies	United States	Health care providers
AAPD	AAPD, 2017	Policy on dietary recommendations for infants, children, and adolescents	United States	Health care providers
ABM	Taylor and ABM, 2018	ABM Clinical Protocol 29: Iron, zinc, and vitamin D supplementation during breastfeeding	United States	Health care Providers
AHA[d]	Gidding et al., 2005	Dietary recommendations for children and adolescents	United States	Health care providers
AND	AND, 2016	Position of the Academy of Nutrition and Dietetics: Vegetarian diets	United States	Health care providers
Australian government, NHMRC	NHMRC, 2012	Infant feeding guidelines	Australia	Health care providers
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Nutrition for healthy term infants: Recommendations from six to 24 months	Canada	Health care providers
	Health Canada et al., 2015[f]	Nutrition for healthy term infants: Recommendations from birth to 6 months	Canada	Health care providers

Includes Author COIs	Stated Methodology[a]	Evidence Assessment Criteria	Includes Guidance on Communication and/or Dissemination[b]	Includes Research Recommendations
No	Literature review	—	Yes	No
No	Literature review	—	Yes	No
No	Review of evidence	National Guidelines Clearinghouse	No	Yes
Yes	Not specified	—	No[e]	No
Yes	Not specified	—	Yes	No
No	Commissioned systematic review; literature review	NHMRC system	Yes	No
No	Not specified	—	Yes	No
No	Not specified	—	Yes	No

continued

TABLE 3-1 Continued

Organization(s)	Citation	Guideline Title	Target Country, Region	Target Audience
CPS	Abrams et al., 2019	Timing of introduction of allergenic solids for infants at high risk	Canada	Health care providers
	Amit et al., 2010[g]	Vegetarian diets in children and adolescents	Canada	Health care providers
	Godel et al., 2007[h]	Vitamin D supplementation: Recommendations for Canadian mothers and infants	Canada	Health care providers
	Grueger et al., 2013[g]	Weaning from the breast	Canada	Health care providers
	Unger et al., 2019	Iron requirements in the first 2 years of life	Canada	Health care providers
EFSA	EFSA Panel on Nutrition et al., 2019	Appropriate age range for introduction of complementary feeding into an infant's diet	Europe	Policy makers
ESPGHAN	Braegger et al., 2013	Vitamin D in the healthy European pediatric population	Europe	Health care providers
	Domellöf et al., 2014	Iron requirements of infants and toddlers	Europe	Not specified
	Fewtrell et al., 2017	Complementary feeding: A position paper by ESPGHAN	Europe	Health care providers
	Fidler Mis et al., 2017	Sugar in infants, children, and adolescents: A position paper of the ESPGHAN Committee on Nutrition	Europe	Health care providers; policy makers
	Hojsak et al., 2018	Young child formula: A position paper by the ESPGHAN Committee on Nutrition	Europe	Not specified
	Szajewska et al., 2016	Gluten introduction and the risk of celiac disease	Europe	Not specified

Includes Author COIs	Stated Methodology[a]	Evidence Assessment Criteria	Includes Guidance on Communication and/or Dissemination[b]	Includes Research Recommendations
No	Not specified	—	No	No
No	Literature review	Canadian Task Force on Preventive Health Care	No	No
No	Not specified	Canadian Task Force on Preventive Health Care	No	Yes
No	Literature review	—	Yes	No
No	Not specified	—	No	No
Yes	Systematic review	Tool proposed by the U.S. National Toxicology Program Office of Health Assessment and Translation	No	No
Yes	Literature review	—	Yes	No
Yes	Literature review	—	Yes	Yes
Yes	Systematic literature search	—	No	Yes
Yes	Systematic literature search	—	Yes	Yes
Yes	Systematic literature review	—	No	No
Yes	GRADE procedures	GRADE	No	Yes

continued

TABLE 3-1 Continued

Organization(s)	Citation	Guideline Title	Target Country, Region	Target Audience
New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	*Healthy Smile, Healthy Child*, 3rd edition	New Zealand	Health care providers
New Zealand Ministry of Health	Ministry of Health, 2012	Food and nutrition guidelines for healthy infants and toddlers: A background paper	New Zealand	Health care providers; program administrators
	Ministry of Health, 2013	Companion statement on vitamin D and sun exposure in pregnancy and infancy in New Zealand	New Zealand	Health care providers
NICE	NICE, 2008	Maternal and child nutrition: Public health guideline	United Kingdom	Health care providers; policy makers
NIH/NIAID[i]	Togias et al., 2017	Addendum guidelines for the prevention of peanut allergy in the United States: Report of the NIAID-sponsored expert panel	United States	Health care providers
PAHO/WHO	PAHO/WHO, 2003	Guiding principles for complementary feeding of the breastfed child	General, global guidance	Community leaders; health care providers; policy makers; program administrators
RCPCH	RCPCH, 2019[j]	Breastfeeding in the UK—position statement	United Kingdom	Health care providers; policy makers

Includes Author COIs	Stated Methodology[a]	Evidence Assessment Criteria	Includes Guidance on Communication and/or Dissemination[b]	Includes Research Recommendations
No	Not specified	—	Yes	No
No	Literature review; best practices	—	Yes	No
No	Not specified	—	No	No
No	Rapid reviews	NICE methodologies	Yes	Yes
Yes	Prepared literature review; supplementary documents; expert opinion; public comment period	GRADE	Yes	No
No	Discussions at several technical consultations and documents on complementary feeding	—	Yes	No
No	Not specified	—	Yes	Yes

continued

TABLE 3-1 Continued

Organization(s)	Citation	Guideline Title	Target Country, Region	Target Audience
RWJF-HER[k]	Lott et al., 2019	Consensus statement: Healthy beverage consumption in early childhood	United States	Advocates; health care providers; parents and guardians
	Pérez-Escamilla et al., 2017	Feeding guidelines for infants and young toddlers: A responsive parenting approach	United States	Early care and education providers; health care providers; parents and guardians
SACN	SACN, 2018	Feeding in the first year of life	United Kingdom	Policy makers
SACN; COT	SACN and COT, 2018	Assessing the health benefits and risks of the introduction of peanut and hen's egg into the infant diet before 6 months of age in the United Kingdom	United Kingdom	Policy makers
SIGENP; SIAIP; with support from experts from SINPE and ESPGHAN	Alvisi et al., 2015	Recommendations on complementary feeding for healthy full-term infants	Italy	Health care providers
USPSTF	Moyer, 2014	Prevention of dental caries in children from birth through age 5 years: U.S. Preventive Services Task Force recommendation statement	United States	Health care providers

Includes Author COIs	Stated Methodology[a]	Evidence Assessment Criteria	Includes Guidance on Communication and/or Dissemination[b]	Includes Research Recommendations
No	Review of source documents, reports, and narrative literature reviews; expert panel meetings	—	Yes	Yes
No	Review of key studies and infant and toddler feeding guidelines from diverse countries; interviews with experts in the field; expert panel consensus	—	Yes	Yes
No	Literature searches based on SACN's Framework for the Evaluation of Evidence	GRADE	No	Yes
No	Systematic review and a formal benefit–risk assessment using the Benefit-Risk Analysis for Foods (BRAFO) methodology	GRADE	Yes	No
Yes	Not specified	—	No	No
Yes	Systematic review	USPSTF grading system	No[l]	Yes

continued

TABLE 3-1 Continued

Organization(s)	Citation	Guideline Title	Target Country, Region	Target Audience
WHO	WHO, 2005	Guiding principles for feeding nonbreastfed children 6–24 months of age	General, global guidance	Policy makers; program administrators
	WHO Secretariat et al., 2007	Prevention and control of iodine deficiency in pregnant and lactating women and in children less than 2 years old	Global guidance[m]	Policy makers

NOTES: The phrase "health care provider" encompasses a range of practitioners, including but not limited to physicians, nurse practitioners, nurses, dentists, registered dietitian nutritionists, and other nutrition professionals. AAFP = American Academy of Family Physicians; AAP = American Academy of Pediatrics; AAPD = American Academy of Pediatric Dentistry; ABM = Academy of Breastfeeding Medicine; AHA = American Heart Association; AND = Academy of Nutrition and Dietetics; COT = Committee on Toxicity of Chemicals in Food, Consumer Products, and the Environment; CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; GRADE = Grading of Recommendations Assessment, Development and Evaluation; HC = Health Canada; NIAID = National Institute of Allergy and Infectious Diseases; NICE = National Institute for Health and Care Excellence; NIH = National Institutes of Health; PAHO = Pan American Health Organization; RCPCH = Royal College of Paediatrics and Child Health; Recs. = recommendations; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition; SIAIP = Italian Society of Pediatric Allergology and Immunology; SIGENP = Italian Society of Gastroenterology, Hepatology and Pediatric Nutrition; SINPE = Italian Society for Parenteral and Enteral Nutrition; UK = United Kingdom; U.S. = United States; USPSTF = U.S. Preventive Services Task Force; WHO = World Health Organization.

[a] Methodologies presented in this column summarize what was presented in the guideline document. As a result, some of the terminology varies. Documents and resources that did not explicitly describe their methodology are listed as "Not specified." Such documents may have included a narrative literature review but did not explain how evidence was identified and/or used to develop the feeding recommendations. The designation in this column may differ from the category assigned to specific recommendations in Chapters 4 and 5 and Appendix B.

[b] This includes a statement of any length providing guidance related to changing knowledge, attitudes, and/or behaviors, and the channels by which to spread feeding guidance.

[c] Document also noted that it was reviewed by relevant AAP sections and committees and by the Centers for Disease Control and Prevention, the U.S. Department of Agriculture, and the U.S. Food and Drug Administration.

Includes Author COIs	Stated Methodology[a]	Evidence Assessment Criteria	Includes Guidance on Communication and/or Dissemination[b]	Includes Research Recommendations
No	Evidence presented in the background document; consensus of participants in the meeting	—	Yes	No
No	Not specified	—	No	Yes

[d] Endorsed by AAP.

[e] This document included a section called "Implementation of Dietary Recommendations Including Considerations for Specific Age Groups." However, this section contains the feeding recommendations the committee abstracted and does not contain additional guidance on the communication or dissemination of the recommendations.

[f] No date was provided for this resource. Year in citation reflects year the webpage was last updated. The text of the resource indicates it preceded Health Canada et al., 2014.

[g] Reaffirmed in 2018.

[h] Reaffirmed in 2017.

[i] This guideline document was developed using a coordinating committee representing 25 professional organizations and a 26-member expert panel.

[j] Date reflects year the webpage was last modified. The post date is listed as 2017.

[k] Lott et al. (2019) was a consensus document that included participation from AAP, AAPD, AHA, and AND.

[l] The guideline includes a section on implementation, but the information does not pertain to the recommendation related to what or how to feed infants and young children.

[m] Recommendations were provided by regions defined by salt iodization and iodine intake status.

TYPES OF GUIDELINE DOCUMENTS

Guidance about what and how to feed young children appears in a variety of document types, both within and between organizations. Professional organizations often provide different forms of guidance to the membership versus the stakeholder communities. The American Academy of Pediatrics (AAP), for instance, publishes policy statements that provide the organization's position and recommendations on an advocacy or public health topic (AAP IHCW, 2020). AAP clinical reports, in contrast, provide pediatricians with practical guidance (AAP IHCW, 2020). The Academy of Nutrition and Dietetics (AND) publishes different types of guidance for its members and stakeholders based on the level of available evidence and practice considerations. When a topic covered by a systematic review is "controversial, confusing, important for policy, or requires clarification," AND publishes a position statement if the systematic review has Grade I or II evidence and a consensus statement if the systematic review has Grade III evidence (Handu et al., 2018, p. 1743). AND position statements were previously based on narrative reviews; in the past few years, the process has changed to base the position statements on systematic reviews. Position and consensus statements are separate from the AND Evidence-Based Nutrition Practice Guidelines, which are created from the systematic review if the topic is complex and merits the creation of formal practice recommendations (Handu et al., 2018).

The World Health Organization has included recommendations in a variety of publications, including guideline documents (e.g., WHO, 2001), descriptions of guiding principles (e.g., PAHO/WHO, 2003; WHO, 2005), and journal articles (e.g., WHO Secretariat et al., 2007). Recommendations from national governments can also take various forms. Health Canada, for instance, participated in a collaborative effort that included three health professional groups to develop nutrition recommendations for healthy, term infants from birth to 6 months and 6–24 months (Health Canada et al., 2014, 2015); the guidance, along with the scientific rationale, is posted on Canadian government-hosted webpages. The New Zealand Ministry of Health prepared an extensive background document for the food and nutrition guidelines (Ministry of Health, 2012), which served as the policy basis for educational resources for the public.

Challenges Related to Summarizing Recommendations from Different Types of Guideline Documents

The types of documents that contain feeding recommendations vary both within and between organizations, and have changed over time within an organization, which makes comparisons challenging. For some organi-

zations, policy statements offer a position on a particular topic, but the practitioner-oriented publications often provide specific guidance on what or how to feed infants and young children. Similarly, both nongovernmental organizations and governmental agencies offer a range of reports that contain feeding guidance. As a goal of this report was to explore the scope of topics that have been covered in existing guideline documents, the committee was broadly inclusive and uses the term *guideline document* to describe the wide range of resources, websites, and materials that screened eligible based on the committee's inclusion criteria. The committee acknowledges that, in some cases, the included documents are not formally considered guidelines by the identified organizations, and that the heterogeneity likely contributes to some of the differences observed across recommendations described in Chapters 4 and 5.

LEVEL OF COLLABORATION

Most of the eligible guideline documents were prepared by a single organization. A subset, however, reflected collaborative efforts between multiple agencies, organizations, or groups. The eligible guideline documents reflect the contributions of 26 different organizations.[1]

The types of collaboration between organizations varied. For instance, the Breastfeeding Committee for Canada, the Canadian Paediatric Society (CPS), Dietitians of Canada, and Health Canada worked together on two guideline documents related to nutrition in the first 2 years of life (Health Canada et al., 2014, 2015). For a 2019 Robert Wood Johnson Foundation-Healthy Eating Research (RWJF-HER) guideline document, a consensus panel was convened with representatives from AND, the American Academy of Pediatric Dentistry (AAPD), AAP, and the American Heart Association (AHA) (Lott et al., 2019). The guideline document by Alvisi et al. (2015) was a collaboration between the Italian Society of Gastroenterology, Hepatology and Pediatric Nutrition (SIGENP) and the Italian Society of Pediatric Allergology and Immunology (SIAIP); the document also acknowledged "support of nutrition experts from the Italian Society for Parenteral and Enteral Nutrition (SINPE) and the European Society [for] Pediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN)" (Alvisi et al., 2015, p. 1).[2] Some of the eligible guideline documents were endorsed by other groups. For example, an AAP clinical report about bone health (Golden et al., 2014) stated that it was endorsed

[1] This value takes into account the caveats decisions described in the section "Challenges Related to Discerning Collaborators."

[2] Alvisi et al., 2015, is licensed under CC BY 4.0 (http://creativecommons.org/licenses/by/4.0).

by the organization American Bone Health. Similarly, a guideline document from AHA stated that it was endorsed by AAP (Gidding et al., 2005). Some collaborations were between different advisory committees reporting to a government. For example, two independent scientific advisory committees to the UK government collaborated on a joint statement (SACN and COT, 2018).

Challenges Related to Discerning Collaborators

One of the challenges the committee encountered was that some of the organizations that collaborated on guideline documents also had their own, separate guideline document that provided recommendations on the same topic. In some cases, it was unclear if the newer recommendation (be it the stand-alone or collaborative guideline document) superseded the previously published recommendations. For instance, CPS participated in a collaborative guideline document in which a recommendation advised that pasteurized homogenized cow milk could be introduced at 9–12 months (Health Canada et al., 2014). In a later stand-alone CPS guideline document, the recommendation indicates that cow milk should be introduced at 12 months of age (Unger et al., 2019).

Another challenge the committee encountered was characterizing organizations when they were described as something other than a direct collaborator. For instance, the guideline document by Alvisi et al. (2015) stated that support was provided by members from SINPE and ESPGHAN. The extent to which these two organizations were officially involved, as opposed to members of these organizations participating in the process, was not clear. In this case, the committee counted only the two clearly identified collaborators (SIAIP and SIGENP) as the contributing organizations for this particular guideline document. For Togias et al. (2017), the National Institute of Allergy and Infectious Diseases convened a coordinating committee with members representing 25 professional organizations, along with a 26-member expert panel. For this guideline document, the committee did not count the individual organizations separately, but reference to the number of organizations involved in Togias et al. (2017) is accompanied by an explanatory footnote throughout the rest of the report. For Lott et al. (2019), the committee counted RWJF-HER along with the four organizations that participated in the consensus statement development. Organizations noted within a guideline document as endorsing the recommendations were not counted as contributors; however, when an organization had its own publication stating that they endorsed another organization's recommendation, it was counted as a separate guideline document and contributing organization.

SCOPE OF TOPICS COVERED

The eligible guideline documents ranged in the scope of topics covered. Some of the guideline documents provided broad explorations of many different topics related to feeding infants and young children (e.g., Gidding et al., 2005; Ministry of Health, 2012; NHMRC, 2012; NICE, 2008; Pérez-Escamilla et al., 2017; SACN, 2018). Others focused on providing guidance for just early infancy (e.g., Health Canada et al., 2015) or the complementary feeding period (e.g., Alvisi et al., 2015; Fewtrell et al., 2017; Health Canada et al., 2014; PAHO/WHO, 2003; WHO, 2005). Some were conceptually broad, but proved to be narrower in scope because of the guideline's target audience. For example, a 2017 guideline document from AAPD titled "Policy on Dietary Recommendations for Infants, Children, and Adolescents" focused its review and recommendations only on dietary practices for the promotion of dental health (AAPD, 2017). In contrast, most of the included guideline documents focused on a specific topic area (e.g., breastfeeding, fruit juice consumption, supplementation, vegetarian and vegan diets, iron requirements). These types of documents tended to provide multiple detailed recommendations on the singular topic.

Challenges Related to Scope of Topics Covered

The guideline documents that broadly covered a range of topic areas about feeding during the first 2 years of life are repeatedly represented throughout the committee's summaries in Chapters 4 and 5. A guideline document with a more specific focus inherently appears less frequently throughout. Nevertheless, both broad and narrowly focused guideline documents serve important roles in informing health care providers, parents and guardians, policy makers, early care and education providers, and other target audiences. As such, the committee captured the range of recommendations that met its eligibility criteria.

The original intent of the committee was to include only the most recent recommendation on a given topic area from each organization. However, looking across the collection of eligible guideline documents, the committee recognized that publication date could not completely drive its decision making. In situations where an organization had multiple publications with recommendations on a particular topic area, the guideline documents typically differed in scope. For instance, CPS participated in two collaborative guideline documents (Health Canada et al., 2014, 2015) and published three separate guideline documents (Amit et al., 2010; Godel et al., 2007; Grueger et al., 2013), each of which included one or more recommendations related to vitamin D. The collaborative guideline documents

were broad in scope, and covered infant and young child feeding from birth to 24 months. The three separate guideline documents from CPS focused on different topics including vegetarian diets in children (Amit et al., 2010), "weaning from the breast" (Grueger et al., 2013), and vitamin D supplementation (Godel et al., 2007), with each providing recommendations on vitamin D. In such instances, rather than attempting to judge whether any of the recommendations were superseded, the committee opted to include all statements of recommendation from an organization on a given topic when the scope of the guideline documents differed.

TARGET COUNTRY OR REGION

The included guideline documents reflected the contributions of agencies, organizations, or groups from Australia, Canada, Europe, Italy, New Zealand, the United Kingdom, and the United States, along with global guidance from the World Health Organization.

TARGET AUDIENCES

Most of the eligible guideline documents targeted health care providers, including but not limited to physicians, nurse practitioners, nurses, dentists, registered dietitian nutritionists, and other nutrition professionals. Across the collection of eligible guidelines, additional target audiences were identified, but were not as common: advocates, community leaders, early care and education providers, program administrators, parents, and policy makers.

Challenges Related to Recommendations for Different Target Audiences

The structure and wording of some of the recommendations intended to inform health care providers were prefaced with the action the health care provider should take (e.g., "Pediatricians should advocate for…"; "Parents should be encouraged to…"; "Explain to parents and caregivers that…"). In such cases, the committee focused on the portion of the recommendation that pertained specifically to what or how to feed the infant or young child, rather than the action of the health care provider.

GUIDELINE DOCUMENT METHODOLOGIES

During document-level abstraction, the committee noted whether the identified guideline document included a description of the overall methodology used. Many of the eligible guideline documents did not specify how the literature cited throughout the document was identified and assessed.

Guideline documents that included an overall methodology tended to describe narrative review literature searches. Few guideline documents conducted systematic reviews and/or integrated a commissioned systematic review (see Table 3-1). Of these, some reported using evidence grading methodology (e.g., Grading of Recommendations Assessment, Development and Evaluation; Canadian Task Force on Prevention Health Care; National Guideline Clearinghouse), while others did not.

Challenges Related to Assessing Guideline Document Methodologies

The extent to which methodologies were described varied across guideline documents. In some cases, even when the general methodology used to identify the evidence was included, recommendations could not be mapped to the evidence cited. Even in guideline documents that described using a systematic review, individual recommendations could not always be directly mapped to a systematic review question. Stated document methodologies were not always consistent. For instance, some guideline documents stated using a "systematic review," whereas others described their methodology as "systematic literature search" or "systematic literature review." As the committee focused on the information provided within the guideline documents themselves, it was unable to discern if these differences in terminology reflected true methodological differences.

As described above, guideline documents varied in scope. Some topic areas, such as those for which randomized controlled trial data are available (e.g., micronutrient supplementation), may lend themselves to using formal evidence assessment techniques. For many topic areas related to infant and young child feeding, the nature of the available evidence may be well understood to those making the recommendations, and this could be one reason why many of the guideline documents used a less formal narrative literature review approach.

Few guideline documents formally graded the evidence to support recommendations, and even fewer systematically indicated additional considerations related to the recommendations, such as potential benefits versus harms, side effects, or risks. Of the guidelines that graded the evidence to support recommendations, the grading system used varied. For instance, two guidelines from the Canadian Paediatric Society used the Canadian Task Force on Preventive Health Care grading system to rate the strength of the recommendation (Amit et al., 2010; Godel et al., 2007). In other cases, such as the Australian government's literature review to support its infant feeding guidelines (NHMRC, 2012), a system was used to describe the state of the evidence for specific questions (e.g., "What are the risks associated with feeding unmodified cow's milk to infants less than 12 months of

age?"[3]) that then inform broader recommendations. In some instances, ratings were provided within a guideline document without a clear description of their meaning. The committee noted evidence rating systems as they were reported in the guideline documents. Recommendations that are accompanied by a rating are footnoted throughout Appendix B.

Although the stated methodology can provide initial insight into the process as described, caution against overinterpretation is warranted. Some high-quality narrative reviews also follow structured and thorough protocols. Furthermore, not all systematic reviews follow best-practice procedures. The committee did not assess or determine the quality or fidelity of the stated approaches. Given this, the stated methodologies summarized in Table 3-1 can serve as only a general indicator of guideline development approaches, without reflecting a judgment of quality.

DECLARATION OF CONFLICTS OF INTEREST

As a check on reporting best practices, the committee recorded which guideline documents included a statement about the guideline authors' conflicts of interest. Seventeen of the 43 guideline documents included such statements.

STATEMENTS OF RECOMMENDATION

The committee broadly interpreted the concept of *feeding recommendations* as concluding or summary statements that provided specific guidance related to what or how to feed infants or young children. For many guideline documents, these statements were found in a section labeled "Recommendations." Other guideline documents, however, presented guidance under headings such as "Summary," "Policy Statement," "Conclusions," "Key Points," and "Anticipatory Guidance," or simply noted it as being "guidance for practice." In addition to how recommendations were labeled, their presentation varied across the guideline documents. In many cases, recommendations were provided at the end of the guideline document, chapter, or section in narrative form or as bulleted lists; some were found in boxes or in tables. The committee captured the verbatim statements of recommendation as presented in the guideline documents. In some instances, this meant capturing several sentences that the guideline document had grouped together in a single bullet point as the statement of recommendation. Often, the concepts reflected in these complex statements of recommendation crossed several topic areas. Many of the recommendations intertwined context for the particular action. For example, a recom-

[3] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

mendation from the New Zealand Ministry of Health (Ministry of Health, 2012, p. 118) stated, "Dried fruit is not recommended as a snack between meals because it sticks to teeth and is cariogenic." This recommendation includes both the action (not giving dried fruit as a snack between meals) and the rationale for the action (due to its cariogenic properties).

Challenges Related to Recommendation Statements

In strategizing how to summarize the state of recommendations on feeding infants and young children, the committee had initially envisioned being able to quantify the number of recommendations on a particular topic area. As the committee reviewed the format of recommendations in the eligible guideline documents, however, it became rapidly apparent that a more qualitative approach was needed.

Some guideline documents, particularly those that broadly described feeding recommendations from birth to 24 months, often presented recommendations multiple times (e.g., across age groups), and in slightly different ways. As the committee's approach was to capture verbatim statements of recommendation, this posed a challenge. If one of the repetitive recommendations provided slightly more information than an alternative version in the guideline document, the more comprehensive version was abstracted. One guideline document in which this was particularly difficult to navigate was a 2017 RWJF-HER document (Pérez-Escamilla et al., 2017). The guideline document included eight appendixes of guidance on what and how to feed infants and young children; the statements were presented as several pages of bullet points, thematically grouped into tables and presented by age groups. Some of the statements provided rationale or context, rather than a feeding recommendation (e.g., "Parents may feel overwhelmed when their babies cry or seem fussy."). Within the document, tables of different themes often repeated or slightly reworded the recommendations presented elsewhere. The committee attempted to consolidate the recommendations and select the most comprehensive option available. It is possible that not all of the concepts presented in Pérez-Escamilla et al. (2017) have been fully captured through the committee's consolidation and abstraction process. Given these considerations, caution is warranted in interpreting the number of recommendations described in Chapters 4 and 5 as strict quantification; rather, the numbers describe the number of recommendation units abstracted, which in turn was used to map the evidence. The number of guideline documents that commented on a particular topic area may serve as a more informative metric.

Another challenge the committee faced related to summarizing the abstracted recommendations was the level of detail provided in each statement. As described above, both the type and scope of the guideline documents influenced the information provided in the recommendation. Some

of the policy statement documents made general statements, whereas more detailed-oriented recommendations appeared in focused or clinically oriented guideline documents. The primary focus of the committee's summary of recommendations was the abstracted statements. However, there were instances in which the committee sought and added clarifying details from a guideline document, in addition to the clearly labeled statements of recommendation within the document, when there were apparent discrepancies across recommendations on the same topic that were likely attributable to the level of detail incorporated directly into the statement of recommendation by guideline authors. In these cases, it was difficult to judge whether or not the guideline authors intended those details to be part of the formal recommendation, but consultation with the guideline document authors to determine this was beyond the committee's scope of work.

In a unique situation, the committee was aware of key guidance that did not exist in the format that could be abstracted using the standard approach. In its search for eligible guideline documents, the committee identified an AAP clinical report on vitamin D (Wagner et al., 2008). The guideline, however, had since been retired; in 2012, AAP released a statement of endorsement for the updated Dietary Reference Intakes (DRIs) for vitamin D and calcium (AAP, 2012). As the committee did not abstract DRI values or endorsements of DRIs, AAP appeared absent from the vitamin D recommendation topic area, as none of the other identified guideline documents from AAP contained the level of detail that had existed in the 2008 clinical report. However, a more recent AAP clinical report (Golden et al., 2014) included a statement about vitamin D supplementation of breastfed and partially breastfed infants, although it was presented in the narrative text of the guideline document, rather than the summary recommendation portion. Ultimately, the committee determined that the supplementation guidance included in Golden et al. (2014) should be included in its summaries, as it reflected AAP's best practice recommendations for health care providers. This example demonstrates that, despite efforts to be comprehensive in its searches, the committee may not have captured all current recommendations from relevant sources.

In its efforts to summarize existing feeding recommendations, the committee grouped recommendations into topic areas, which were then categorized as being broadly related to either *what to feed* or *how to feed*. Identified themes within a topic area, however, did not always precisely match the *what* or *how* to feed categorization. For instance, there were several recommendations related to intake of sugars.[4] Most of the recommen-

[4] Terminology related to *sugar* and *sugars* varies in the field. Whereas some may use the singular to refer specifically to the disaccharide sucrose, it is often used to describe sweeteners broadly. As much as possible, the committee uses verbatim language related to sugars from each recommendation.

dations discussed limiting intake and providing foods with no or limited added or total sugars, which clearly fell within the concept of *what to feed*. However, there were some recommendations that advised against dipping pacifiers or bottle teats in sugary substances (e.g., sugar, honey, jam, sweetened drinks), which is more of a *how to feed* concept. Another example is the guidance related to safety of foods and feeding practices, which the committee grouped into a single topic area. Recommendations related to the prevention of choking clearly fell under the *how to feed* concept, but recommendations related to consumption of pasteurized juice, milk, and dairy products; honey; and raw or undercooked foods fell more within the concepts of *what to feed*. In these instances, the committee decided that it was more important to keep recommendations on a particular topic area together than to strictly categorize each recommendation based on whether it fit best within *what* or *how* to feed. Therefore, some of the themes discussed in Chapter 4 relate to *how to feed* concepts, and some of the themes discussed in Chapter 5 relate to *what to feed* concepts.

EVIDENCE MAPPING TO EACH RECOMMENDATION

In addition to capturing the overall methodology described in each guideline document, the committee noted what type of evidence mapped to each recommendation. This documentation was performed at the recommendation level, as different types of evidence could potentially support different recommendations within the same guideline document. The committee considered investigation of citations within the guideline documents to be beyond its Statement of Task. Thus, the documentation of the type of evidence that mapped to each recommendation was based only on the information provided within the guideline document itself, except in the few instances in which a source document of related material was made available to support the guideline document.

Given the diversity in document types and formats, the committee used broad groupings to characterize the evidence that mapped to each recommendation. A designation of "systematic review" meant an entire systematic review was contained within the guideline document or a systematic review was specifically prepared to be used to develop the guideline document. The designation of "narrative review," in contrast, broadly captured a wide range of approaches. This option was selected when two or more references were cited as evidence in the narrative that mapped to the recommendation. One important caveat to this designation is that any type of document or resource could be cited; this includes citing previously published systematic reviews that were not prepared for the purposes of that specific guideline document. Other types of evidence, such as single research studies or web resources, were also noted. One additional option was available to char-

acterize the evidence that mapped to each recommendation—"could not be mapped." This option was selected when the committee was unable to discern which portions of the guideline document were used to justify or support the recommendation.

Challenges Related to Evidence Mapping to Each Recommendation

Despite using broad categories, the committee found that discerning which type of evidence mapped to each recommendation was one of the most challenging portions of its task. Few of the eligible guideline documents were structured in a way that clearly presented the evidence and rationale for each individual statement of recommendation. Instead, a common format used across many guideline documents was to present a narrative discussion, followed by all recommendations presented together. The committee attempted to disaggregate such presentations, and looked in the narrative sections for portions that specifically related to each stated recommendation. This approach to documenting the type of evidence used is subjective and is contingent on being able to locate portions of a guideline document relevant to each statement of recommendation. As discussed earlier in this chapter, assessing the fidelity of the procedures and quality of the materials used to support each recommendation was considered beyond the scope of the committee's task. Consequently, the committee's categorization of the types of evidence used should be regarded as a qualitative description of how evidence is presented in guideline documents, rather than being viewed as a statement about the strength and quality of evidence that supports each recommendation. The committee also notes that the inability to map a recommendation to its evidence, or use of a narrative review as opposed to a systematic review, should not be viewed as diminishing the importance or usefulness of important practical guidance.

INCLUSION OF GUIDANCE ON COMMUNICATION AND DISSEMINATION

The committee noted when a guideline document included guidance on communicating or disseminating the feeding recommendations. Across the 43 guideline documents, 25 included such a statement or section. This topic is further explored in Chapter 6.

INCLUSION OF RESEARCH RECOMMENDATIONS

As a check on reporting best practices, the committee recorded which guideline documents included explicit research recommendations. Fourteen of the 43 guideline documents included such statements.

SUMMARY

Existing feeding recommendations summarized in this report are from a diverse collection of guideline documents that met the committee's eligibility criteria. The guideline documents varied with respect to the document type (e.g., position statement, clinical practice reports), level of collaboration, scope of topics covered, target audiences, stated methodologies, presentation of recommendations, and mapping of evidence to each recommendation. Each of these variables affected the committee's ability to summarize the current state of feeding recommendations for infants and young children. The committee notes that, although some aspects have been quantified in Chapters 4 and 5 for descriptive purposes, the committee's summaries are intended to be qualitative in nature.

4

Existing Recommendations on What to Feed

Chapter Highlights

- All 43 eligible guideline documents included one or more recommendations related to what to feed infants and young children.
- Existing recommendations on *what to feed* infants and young children were consistent or generally consistent for most topic areas.
- Differences were identified in some topic areas, particularly related to the age or age range specified in the recommendation, including
  - Age to which breastfeeding should be continued,
  - The suitability of cow milk for infants 9–12 months of age,
  - When and how to introduce peanuts based on infant's risk for peanut allergy, and
  - Age of introduction of iron-rich complementary foods.
- Most recommendations mapped to narrative reviews.
- A summary of consistency across recommendations on *what to feed* infants and young children is presented in a table at the end of this chapter.

This chapter reviews the recommendations related to *what to feed* infants and young children that were included in the guideline documents that met the committee's inclusion criteria (see Chapter 2). Numerous topics related to what to feed infants and young children did not appear in the eligible guideline documents. Thus, although this chapter is a comprehensive summary of the identified recommendations, it is not an exhaustive summary of all topics that are of interest to various stakeholders. Eligible recommendations were found in all 43 guideline documents. The recommendations have been grouped into 18 topic areas; within those topic areas, recommendations are discussed thematically. Throughout this chapter, the following terminology is used:

- *Organization* refers to the agency, organization, or group that directly participated in the guideline development. Throughout, there is reference to *different organizations*, which refers to the number of unique entities that participated in one or multiple guideline documents.
- *Guideline document* refers to the overall resource (e.g., journal article, report, webpage) from the organization that contains the recommendation(s).
- *Recommendation* refers to a statement on one or multiple topic areas that the committee abstracted from the guideline documents. Each abstracted recommendation is provided in Appendix B.
- *Consistency* refers to the committee's comparison of existing recommendations on a given theme. Box 4-1 presents the terminology the committee uses throughout this chapter to describe the levels of consistency.

BOX 4-1
Committee's Terminology Related to Consistency of Recommendations

- *Consistent* indicates alignment across the recommendations.
- *Generally consistent* indicates that the recommendations tended to provide similar guidance, although there were some differences in details or wording.
- *Some inconsistencies* indicates mixed recommendations, some of which align.
- *Not consistent* indicates recommendations provided different guidance on a topic.

EXCLUSIVE BREASTFEEDING

Fifteen guideline documents included recommendations related to exclusive breastfeeding (see Appendix B, Table B-1). Four of the guideline documents were collaborative efforts between two or more organizations (Health Canada et al., 2015; New Zealand Dental Association, 2008; PAHO/WHO, 2003; SACN and COT, 2018). The identified guideline documents reflect 17 different organizations from Australia, Canada, Europe, New Zealand, the United Kingdom, and the United States, along with the Pan American Health Organization (PAHO) and the World Health Organization (WHO).[1]

Defining What Constitutes *Exclusive*

The identified recommendations largely did not define or specify what constituted *exclusive breastfeeding*. One recommendation stated "most babies only need breast milk (or formula)" (Pérez-Escamilla et al., 2017 [RWJF-HER]). Some of the guideline documents included additional recommendations advising against routine supplementary formula feedings among breastfed infants or providing any other liquids (AAFP, 2014; NHMRC, 2012; RCPCH, 2019) (for additional information, see the "Supplementary Formula Feeding of Breastfed Infants" section below and Appendix B, Table B-3). The committee notes that definitions of exclusivity may have been included in the narrative text of the guideline documents, rather than the statements of recommendation.

Duration of Exclusive Breastfeeding

Fifteen guideline documents included recommendations related to duration of exclusive breastfeeding. Thirteen of the guideline documents recommended exclusive breastfeeding for the first 6 months of age. There was slight variation in the specific wording, using phrases such as "for about 6 months," "around 6 months," "up to 6 months," or "the first 6 months." One guideline document from the Robert Wood Johnson Foundation-Healthy Eating Research (RWJF-HER) stated that the recommendation was "[f]or the first 6 months (or until the introduction of solid food) most babies only need breast milk (or formula)," clarifying that the breastfeeding recommendation was tied to the complementary feeding recommendation (Pérez-Escamilla et al., 2017). Two guideline documents included recom-

[1] Organizations reflected in the guideline documents include AAFP, AAP, AHA, Breastfeeding Committee for Canada, COT, CPS, Dietitians of Canada, ESPGHAN, Health Canada, New Zealand Dental Association, New Zealand Ministry of Health, NHMRC, PAHO, RCPCH, RWJF-HER, SACN, and WHO.

mendations that specified an age range. One guideline document from the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) recommended "exclusive or full breastfeeding … for at least 4 months (17 weeks, beginning of the 5th month of life) and exclusive or predominant breastfeeding for approximately 6 months is considered a desirable goal" (Fewtrell et al., 2017). The other guideline document, from the American Heart Association (AHA), recommended "Maintain breastfeeding as the exclusive source of nutrition for the first 4–6 months of life" (Gidding et al., 2005).

Consistency

The guideline documents were generally consistent in recommending exclusive breastfeeding for up to, about, or around 6 months of age. However, two recommended 4–6 months, one of which emphasized aiming for 6 months.

Evidence Base

Across the 15 guideline documents, the committee identified 16 statements of recommendation. A guideline document from the Australian government (NHMRC, 2012) included two statements of recommendation related to exclusive breastfeeding, pertaining to different contexts; one of the recommendations mapped to a systematic review, whereas the other mapped to previous Australian guidelines. A recommendation from the American Academy of Family Physicians (AAFP) (2014) mapped to a systematic review. One recommendation from an ESPGHAN guideline document (Fewtrell et al., 2017) mapped to a systematic literature search. The recommendations from the Scientific Advisory Committee on Nutrition (SACN) and the Committee on Toxicity of Chemicals in Food, Consumer Products, and the Environment (COT) (2018) and the New Zealand Dental Association (2008) mapped to earlier documents from their organization or other authoritative organizations. Portions of one recommendation from the American Academy of Pediatrics (AAP) (AAP Section on Breastfeeding, 2012) were based on a narrative review, and the rest of the recommendation could not be mapped to its evidence. The rest of the recommendations mapped to narrative reviews and/or technical documents.

CONTINUATION OF BREASTFEEDING

Eighteen guideline documents included recommendations on the continuation of breastfeeding (see Appendix B, Table B-2). Four of the guideline documents were collaborative efforts between two or more organizations

(AAPD, 2016; Health Canada et al., 2014; New Zealand Dental Association, 2008; PAHO/WHO, 2003). The identified guideline documents reflect 18 different organizations from Australia, Canada, Europe, New Zealand, the United Kingdom, and the United States, along with PAHO and WHO.[2]

How Long Breastfeeding Should Continue

Eighteen guideline documents included recommendations related to how long breastfeeding should continue. Fourteen guideline documents recommended continued breastfeeding to at least 12 months of age. Four guideline documents recommended continued breastfeeding to at least 2 years of age (Abrams et al., 2019 [CPS]; Grueger et al., 2013 [CPS]; Health Canada et al., 2014; PAHO/WHO, 2003). Frequently these recommendations included supportive statements of longer durations (e.g., "at least to [age]," "or beyond") and qualifiers (e.g., "as long as mutually desired," "as long as the mother and child desire"). Three guideline documents did not specify a specific duration (AAPD, 2016; Fewtrell et al., 2017 [ESPGHAN]; NICE, 2008). One other document recommended breastfeeding beyond 6 months of age and stated that "mothers should be supported to continue breastfeeding for as long as they wish," but it cited a lack of evidence to support a specific duration of breastfeeding (RCPCH, 2019). Date of publication of the guideline document did not appear to be related to whether the recommended continuation of breastfeeding was to 12 months or 2 years of age.

Four guideline documents related continuation of breastfeeding to benefits. One guideline document, from the Australian government, recommended breastfeeding for the first 6–12 months and beyond, but also stated, "any breastfeeding is beneficial to the infant and the mother" (NHMRC, 2012).[3] Similarly, a guideline document from SACN (2018) noted that exclusive breastfeeding for the first 6 months and continuation for at least the first year "makes an important contribution to infant and maternal health." A guideline document from AAFP that recommended continuing breastfeeding through at least the first year stated, "Health outcomes for mothers and babies are best when breastfeeding continues for at least 2 years" (AAFP, 2014). A guideline document from the American Academy of Pediatric Dentistry (AAPD) (2017) noted that breastfeeding for the first

[2] Organizations reflected in the guideline documents include AAFP, AAP, AAPD, AHA, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, ESPGHAN, Health Canada, New Zealand Dental Association, New Zealand Ministry of Health, NHMRC, NICE, PAHO, RCPCH, RWJF-HER, SACN, and WHO.

[3] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

12 months of life "ensure[s] the best possible health and developmental and psychosocial outcomes for infant."

Five documents explicitly recommended that breastfeeding continue during the introduction and feeding of complementary foods (AAFP, 2014; Fewtrell et al., 2017 [ESPGHAN]), solid foods (NHMRC, 2012; RCPCH, 2019), or dietary carbohydrates (AAPD, 2016). Among these, one stated continuing breastfeeding "until 12 months of age and beyond" (NHMRC, 2012),[4] one stated "through at least the first year" (AAFP, 2014), one stated "beyond 6 months" (RCPCH, 2019), and two did not specify an age (AAPD, 2016; Fewtrell et al., 2017 [ESPGHAN]).

Consistency

The guideline documents were generally consistent in promoting and supporting continued breastfeeding after complementary foods were introduced and until at least 12 months of age, but they were not consistent in terms of the specific age to which breastfeeding should be continued.

Evidence Base

Across the 18 guideline documents, the committee identified 23 statements of recommendation. One of the recommendations that did not specify an age mapped to a systematic literature search (Fewtrell et al., 2017 [ESPGHAN]). A portion of one recommendation from AAP (AAP Section on Breastfeeding, 2012) mapped to a narrative review, and the rest of the recommendation could not be mapped to its evidence. A recommendation from the National Institute for Health and Care Excellence (NICE) (2008) mapped to both a UK Department of Health report (Department of Health, 1994) and a rapid review.[5] Six recommendations from guideline documents by AAFP (2014), AAPD (2017), the Australian government (NHMRC, 2012), and the New Zealand Dental Association (2008) mapped to earlier documents from the issuing organization or other authoritative organizations. One recommendation from ESPGHAN (Hojsak et al., 2018) could not be mapped to its evidence. The remaining recommendations mapped to narrative reviews and/or technical documents, alone or in combination with other resources.

[4] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[5] A rapid review is a literature review process that has simplified or omitted some of the components of the systematic review process. A rapid review has been described as a "streamlined approach to synthesizing evidence—typically for informing emergent decisions faced by decision makers in health care settings" (Khangura et al., 2012).

SUPPLEMENTARY FORMULA FEEDING OF BREASTFED INFANTS

Four guideline documents included recommendations related to supplementary formula feeding of breastfed infants (see Appendix B, Table B-3). The identified guideline documents reflect four different organizations from Australia, New Zealand, the United Kingdom, and the United States.[6]

Routine Supplementary Formula Feedings

Four guideline documents included recommendations related to supplementary formula feedings. All discouraged routine supplementary formula feeding of breastfed infants (AAFP, 2014; Ministry of Health, 2012; NHMRC, 2012; RCPCH, 2019). Medical indication or advice was suggested as the basis for introduction of infant formula to breastfed infants (AAFP, 2014; NHMRC, 2012). One of the recommendations discouraged giving other liquids, in addition to infant formula, to breastfed infants (Ministry of Health, 2012); this topic is explored in greater detail in other sections of this chapter (see "Milk and Milk-Based Products" and "Fluids: Water, Juice, Sugar-Sweetened Beverages, and Other Nonmilk Beverages").

Consistency

The guideline documents were consistent in recommending that breastfed infants should not be routinely given supplementary formula feedings.

Evidence Base

Across the four guideline documents, the committee identified four statements of recommendation. One recommendation from the Australian government (NHMRC, 2012) mapped to a systematic review. Two recommendations—one each from the New Zealand Ministry of Health (2012) and the Royal College of Paediatrics and Child Health (RCPCH) (2019)—mapped to narrative reviews. One recommendation from AAFP (2014) mapped to a WHO/UNICEF document.

DURATION OF INFANT FORMULA USE

Five guideline documents provided recommendations related to the duration of formula use for infants or young children who are formula fed (see Appendix B, Table B-4). One of the guideline documents was a collab-

[6] Organizations reflected in the guideline documents include AAFP, New Zealand Ministry of Health, NHMRC, and RCPCH.

orative effort among four organizations (Health Canada et al., 2014); one of the collaborating organizations (Canadian Paediatric Society [CPS]) also had its own guidelines that included a separate recommendation related to duration of formula use. The identified guideline documents reflect seven different organizations from Australia, Canada, New Zealand, and the United States.[7]

How Long Infant Formula Should Be Used

Five guideline documents included recommendations related to how long infant formula should be used. Four of the guideline documents recommended that, for formula-fed infants, commercial infant formula should be used until 12 months of age (Ministry of Health, 2012; NHMRC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]; Unger et al., 2019 [CPS]). One guideline document recommended "commercial infant formula until nine to 12 months of age" (Health Canada et al., 2014).[8] Two documents explicitly stated that formulas are not needed beyond 12 months of age (Health Canada et al., 2014; Unger et al., 2019 [CPS]). One guideline document from the New Zealand Ministry of Health (Ministry of Health, 2012) recommended that vegan infants who are partially breastfed or not breastfed use "a commercial soy-based infant formula during the first 2 years of life"; recommendations related to vegetarian and vegan diets are explored in detail later in this chapter (see "Vegetarian and Vegan Diets").

Consistency

The guideline documents were generally consistent in recommending that, for formula-fed infants, commercial infant formula should be used until 12 months of age, and infant formula is not needed beyond 12 months of age. Only one of the guideline documents indicated an age range, indicating that infant formula should be used until 9–12 months of age (Health Canada et al., 2014). The recommendation on formula use for 9–12 months is internally consistent with another recommendation in that document to delay cow milk until 9–12 months to reduce iron deficiency (Health Canada et al., 2014).

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[7] Organizations reflected in the guideline documents include Breastfeeding Committee for Canada, CPS, Dietitians of Canada, Health Canada, New Zealand Ministry of Health, NHMRC, and RWJF-HER.

[8] © All rights reserved. *Nutrition for healthy term infants: Recommendations from six to 24 months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

Evidence Base

Across the five guideline documents, the committee identified seven statements of recommendation. Most recommendations mapped to narrative reviews. One of the recommendations from the Australian government (NHMRC, 2012) mapped to a systematic review. One recommendation from Health Canada et al. (2014) could not be mapped to its evidence.

TYPE OF INFANT FORMULA

Seven guideline documents included recommendations on the type of formula for infants receiving formula (see Appendix B, Table B-5). One of the guideline documents was a collaborative effort between multiple organizations (Health Canada et al., 2015), and CPS and AAP each contributed to two guideline documents. Accordingly, the identified guidelines documents reflect eight different organizations from Australia, Canada, New Zealand, and the United States.[9] Discussion of iron-fortified infant formulas is found under the "Iron" section later in this chapter.

Cow Milk–Based Infant Formulas

Six guideline documents included recommendations related to cow milk–based infant formula. All recommended that cow milk–based infant formula be used for infants receiving formula (Bhatia et al., 2008 [AAP]; Health Canada et al., 2015; Ministry of Health, 2012; NHMRC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]; Unger et al., 2019 [CPS]). Three guideline documents recommended use of cow milk formula for 12 months or 1 year of age (Ministry of Health, 2012; NHRMC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]), while one guideline document recommended use of iron-fortified cow milk formula for the first 9–12 months (Unger et al., 2019 [CPS]).

Consistency

The guideline documents were consistent in recommending cow milk–based infant formula for formula-fed infants.

[9] Organizations reflected in the guideline documents include AAP, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, Health Canada, New Zealand Ministry of Health, NHMRC, and RWJF-HER.

Evidence Base

Across the six guideline documents, the committee identified six statements of recommendation. One recommendation from the Australian government (NHMRC, 2012) mapped to a systematic review. The rest of the recommendations mapped to narrative reviews.

Soy-Based Infant Formulas

Five guideline documents included recommendations related to the use of soy-based formulas. Soy-based formula was only recommended in special circumstances, such as for infants with a confirmed pathology or specific medical, religious, or cultural needs (Bhatia et al., 2008 [AAP]; Health Canada et al., 2015; NHMRC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]). Two guideline documents indicated the use of soy formula only under medical supervision (NHMRC 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]). The New Zealand Ministry of Health noted that vegan infants who are not breastfed or who are partially breastfed should receive commercial soy-based infant formula for the first 2 years of life (Ministry of Health, 2012).

Consistency

The guideline documents were consistent in their position on limiting the use of soy-based formula to special circumstances.

Evidence Base

Across the five guideline documents, the committee identified nine statements of recommendation. One recommendation from the Australian government mapped to a systematic review (NHMRC, 2012). The remaining eight recommendations, four of which came from a single guideline document (Bhatia et al., 2008), mapped to narrative reviews.

Hydrolyzed and Hypoallergenic Infant Formula

Three guideline documents included statements related to hydrolyzed or hypoallergenic infant formula. One guideline advised consultation with the child's doctor before use (Pérez-Escamilla et al., 2017 [RWJF-HER]), while another suggested use under medical supervision (NHMRC, 2012). A guideline document from AAP noted evidence that partially or extensively hydrolyzed formula prevented atopic disease was lacking (Greer et al.,

2019 [AAP]); this topic is further explored in detail later in this chapter (see "Foods Associated with Food Allergy and Celiac Disease").

Other Types of Infant Formulas

Four guideline documents included recommendations addressing other types of infant formula not described above. Two guideline documents commented on goat milk infant formula. One from RWJF-HER indicated it was a suitable alternative to breast milk (Pérez-Escamilla et al., 2017), while another guideline document from the Australian government indicated it was not a suitable alternative to cow milk–based formula and should only be used under medical supervision (NHMRC, 2012). The Australian government guideline document (NHMRC, 2012) also made recommendations for the use of specialty formulas with the advice of health professionals for formula-fed infants with confirmed pathology who cannot tolerate cow milk formula. Similarly, the New Zealand Ministry of Health (2012) advised that a health care practitioner be consulted before switching to an alternative formula not based on cow milk. One guideline document noted that homemade, evaporated milk formula should not be used (Health Canada et al., 2015).

Consistency

The two guideline documents that addressed the use of goat milk infant formula were not consistent.

Evidence Base

Across the four guideline documents, the committee identified five statements of recommendation. One of the recommendation from an Australian guideline document (NHMRC, 2012) mapped to a systematic review, while another from the same document mapped to a 2009 WHO report. The rest of the recommendations mapped to narrative reviews.

TODDLER MILKS AND FOLLOW-ON FORMULAS

Six guideline documents included recommendations regarding toddler milks and follow-on formulas (see Appendix B, Table B-6).[10] One of the guideline documents was an RWJF-HER consensus statement that included

[10] Considered breast milk substitutes, these are products that are "specifically marketed for feeding infants and young children up to the age of 3 years" (WHO Secretariat, 2016). They are also known as growing-up milk, growing-up formula, or formulated milk.

participants representing four organizations (Lott et al., 2019), and two of the guideline documents were from ESPGHAN (Domellöf et al., 2014; Hojsak et al., 2018). The identified guideline documents, therefore, reflect nine different organizations from Australia, Canada, Europe, New Zealand, and the United States.[11]

Use of Toddler Milks or Follow-On Formulas

Six guideline documents included recommendations related to the use of toddler milks or follow-on formulas. The RWJF-HER consensus document recommended against provision of transition or weaning formulas in the first year of life, stating that human milk or standard infant formula are the preferred choices (Lott et al., 2019). One guideline document from ESPGHAN indicated that follow-on formulas should be iron fortified, without recommending a specific iron concentration (Domellöf et al., 2014).

Five of the guideline documents stated that toddler milks are not indicated, with the recommendation statements ranging from recommending against the use of toddler milk (Lott et al., 2019 [RWJF-HER]) to stating that toddler milks are not required or necessary (Ministry of Health, 2012; NHMRC, 2012; Unger et al., 2019 [CPS]) or routinely needed (Hojsak et al., 2018 [ESPGHAN]). Appropriate drink options for toddlers were identified as whole cow milk (Ministry of Health, 2012; Unger et al., 2019 [CPS]) or a "suitable alternative" (Ministry of Health, 2012), with one recommendation from an RWJF-HER consensus statement noting that toddler nutrient needs should be met through "nutritionally adequate dietary patterns" (Lott et al., 2019). In one guideline document from ESPGHAN (Hojsak et al., 2018), the statement that toddler milk is not needed was qualified with the caveat that toddler milk or follow-on formula can potentially be used to increase intake of iron, vitamin D, and n-3 polyunsaturated fatty acids and to decrease intake of protein relative to unfortified cow milk. Three of the guideline documents indicated that the recommendation against the general use of toddler milk applied after 12 months (Ministry of Health, 2012; NHMRC, 2012; Unger et al., 2019 [CPS]), with two documents giving more specific age ranges of 1–3 years (Hojsak et al., 2018) and 1–5 years (Lott et al., 2019).

Consistency

The guideline documents were consistent in recommending against the general use of toddler milks, with some variability in the exact language

[11] Organizations reflected in the guideline documents include AAP, AAPD, AHA, AND, CPS, ESPGHAN, New Zealand Ministry of Health, NHMRC, and RWJF-HER.

used. The guideline documents were generally consistent in indicating that the recommendations were applicable to children 12 months of age and older, although the specific age range varied. A single organization (ESPGHAN) mentioned that follow-on formula and toddler milk could potentially be used to change child intake of specific nutrients relative to intakes from cow milk (Domellöf et al., 2014; Hojsak et al., 2018). As only one guideline document commented on iron fortification of follow-on formulas (Domellöf et al., 2014), no comment on consistency can be made. The recommendation against provision of follow-on formulas in the first year of life was made in only one guideline document (Lott et al., 2019 [RWJF-HER]), but this reflected a consensus of the collaborating organizations.

Evidence Base

Across the six guideline documents, the committee identified seven statements of recommendation. The RWJF-HER (Lott et al., 2019) recommendation against provision of follow-on formulas in the first year of life mapped to a narrative review. Of the five recommendations related to use of toddler milks, one mapped to a systematic literature review (Hojsak et al., 2018 [ESPGHAN]), three mapped to narrative reviews (Lott et al., 2019 [RWJF-HER]; Ministry of Health, 2012; Unger et al., 2019 [CPS]), and one recommendation could not be mapped to its evidence (NHMRC, 2012). The ESPGHAN (Domellöf et al., 2014) recommendation related to iron fortification of follow-on formulas mapped to a narrative review.

MILK AND MILK-BASED PRODUCTS[12]

Fourteen guideline documents included recommendations regarding milk and milk-based products apart from infant formula (see Appendix B, Table B-7). Three guideline documents reflected collaborations across multiple organizations (Health Canada et al., 2014; Lott et al., 2019 [RWJF-HER]; New Zealand Dental Association, 2008); five organizations participated in multiple guideline documents. The identified guideline documents reflect 15 different organizations from Australia, Canada, Europe, New Zealand, the United Kingdom, and the United States, along with WHO.[13]

[12] This section does not include milk-based infant formulas or human milk.

[13] Organizations reflected in the guideline documents include AAP, AAPD, AHA, AND, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, ESPGHAN, Health Canada, New Zealand Dental Association, New Zealand Ministry of Health, NHMRC, RWJF-HER, SACN, and WHO.

Milk and Milk-Based Products for Infants 0–12 Months of Age

Thirteen guideline documents provided recommendations related to the use of milk and milk-based products, apart from infant formula, for infants 0–12 months of age. The majority stated that cow milk should not be introduced until 12 months of age (Baker et al., 2010 [AAP]; Lott et al., 2019 [RWJF-HER]; Ministry of Health, 2012; New Zealand Dental Association, 2008; Pérez-Escamilla et al., 2017 [RWJF-HER]; SACN, 2018; Unger et al., 2019 [CPS]). One guideline document from AAP indicated that human milk and infant formula were sufficient to meet the fluid needs of infants, and water and milk were sufficient for older children, but it did not specify age groups within the recommendation (Heyman et al., 2017).[14] Three guideline documents—two from ESPGHAN and the other from the Australian government—stated that cow milk should not be the main beverage before 12 months (Domellöf et al., 2014 [ESPGHAN]; Fewtrell et al., 2017 [ESPGHAN]; NHMRC, 2012). Two of these guideline documents went on to indicate that small volumes could be added to complementary foods (Fewtrell et al., 2017 [ESPGHAN]; NHMRC, 2012). A collaborative Canadian guideline document noted that cow milk could be introduced at 9–12 months, and that intake of pasteurized homogenized (3.25 percent milk fat) cow milk should be no more than 750 mL per day (Health Canada et al., 2014). A guideline document from WHO noted that for nonbreastfed infants 6–24 months of age, "full-cream animal milk (cow, goat, buffalo, sheep, camel), ultrahigh temperature milk, reconstituted evaporated (but not condensed) milk, and fermented milk or yogurt" are acceptable (WHO, 2005)[15]; recommended amounts of milk depended on the amount of other animal-source foods. An Australian government guideline document stated that full-fat yogurt, cheese, or custards are acceptable before 12 months of age (NHMRC, 2012).

Consistency

The guideline documents were generally consistent in recommending against any cow milk before 9 months, but statements regarding intake at 9–12 months and whether milk can be added to complementary foods before 12 months of age were not consistent. Only two guidelines discussed the introduction of milk-based products (e.g., yogurt, cheese); both indicated that such foods could be introduced to older infants.

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[14] Another AAP guideline document stated that donor milk is an alternative to mother's breast milk, in the context of exclusive breastfeeding (AAP Section on Breastfeeding, 2012).

[15] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 12, Copyright (2005).

Evidence Base

Across the 13 guideline documents, the committee identified 18 statements of recommendation. Three recommendations from one guideline document from the Australian government (NHMRC, 2012) mapped to systematic reviews; one of these recommendations also mapped to a narrative review. A recommendation from an ESPGHAN guideline document (Fewtrell et al., 2017) mapped to a systematic literature search. Two recommendations from an RWJF-HER consensus statement (Lott et al., 2019) mapped to previous reports and federal nutrition standards. One recommendation from the New Zealand Dental Association (2008) could not be mapped to its evidence. The remaining recommendations mapped to narrative reviews, alone or in combination with other documents.

Appropriate Fat Content of Milk for Children 12–24 Months of Age

Ten guideline documents included recommendations related to the appropriate fat content of milk for children 12–24 months of age. Nine guideline documents recommended intake of whole cow milk for children 12–24 months of age (Baker et al., 2010 [AAP]; Health Canada et al., 2014; Lott et al., 2019 [RWJF-HER]; Ministry of Health, 2012; New Zealand Dental Association, 2008; NHMRC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]; Unger et al., 2019 [CPS]; WHO, 2005). Two of these guideline documents (both of which were from RWJF-HER), however, stated that reduced- or low-fat milk could be consumed under consultation with a pediatrician (Lott et al., 2019; Pérez-Escamilla et al., 2017). An AAP guideline document indicated that water and low-fat/nonfat milk were sufficient for older children, but it did not specify age groups within the recommendation itself (Heyman et al., 2017). Two guideline documents—one from Canada, the other from Australia—explicitly stated that skim milk is not suitable for the first 2 years of life (Health Canada et al., 2014; NHMRC, 2012).

Consistency

The guideline documents were generally consistent in recommending that whole milk should be provided to children in the age range of 12–24 months. Two guidelines specified circumstances under which reduced-fat milk could be provided (Lott et al., 2019 [RWJF-HER]; Pérez-Escamilla et al., 2017 [RWJF-HER]). Only one guideline document suggested that reduced-fat or nonfat milk was appropriate for "older children," but it did not specify the applicable age range (Heyman et al., 2017 [AAP]).

Evidence Base

Across the 10 guideline documents, the committee identified 14 statements of recommendation. Most of the recommendations mapped to narrative reviews, alone or in combination with other documents. Two recommendations from an RWJF-HER consensus statement (Lott et al., 2019) mapped to previous reports and federal nutrition standards. One recommendation from the Australian government (NHMRC, 2012) mapped to a systematic review, a narrative review, and a WHO European region report. Another recommendation from the Australian government guideline document (NHMRC, 2012) and two recommendations from the New Zealand Dental Association (2008) could not be mapped to their evidence.

Amount of Milk and Milk-Based Products for Children 12–24 Months

Six guideline documents provided quantitative recommendations for milk intake for children 12–24 months of age. Guideline documents from ESPGHAN, the New Zealand Ministry of Health, and RWJF-HER advised limiting cow milk intake to approximately 500 mL per day (Domellöf et al., 2014; Ministry of Health, 2012; Pérez-Escamilla et al., 2017). A separate collaborative consensus statement from RWJF-HER advised to limit milk intake to approximately 500–700 mL per day (Lott et al., 2019). Another guideline document recommended offering 500 mL of milk per day, but limiting it to no more than 750 mL per day (Health Canada et al., 2014). One recommendation for nonbreastfed children from WHO encouraged 200–400 mL milk per day (from any animal source) if animal-source foods are regularly consumed and 300–500 mL milk per day if not (WHO, 2005). One guideline document from RWJF-HER indicated that half to three-quarters of a cup of plain yogurt without excessive total sugars could be given in place of milk (Pérez-Escamilla et al., 2017).[16]

Consistency

There were some inconsistencies in the recommended limit for the amount of cow milk consumed by children 12–24 months of age, from approximately 500 to 750 mL per day.

[16] Terminology related to *sugar* and *sugars* varies in the field. Whereas some may use the singular to refer specifically to the disaccharide sucrose, it is often used to describe sweeteners broadly. As much as possible, the committee uses verbatim language related to sugars from each recommendation.

Evidence Base

Across the six guideline documents, the committee identified eight statements of recommendation. Most of the recommendations mapped to narrative reviews, either alone or in combination with other resources. One of the recommendations from the RWJF-HER consensus guideline document (Lott et al., 2019) mapped to previous reports and federal nutrition standards.

Flavored Milk

Three of the guideline documents included recommendations related to flavored milk (Fidler Mis et al., 2017 [ESPGHAN]; Lott et al., 2019 [RWJF-HER]; Pérez-Escamilla et al., 2017 [RWJF-HER]). The two RWJF-HER guideline documents indicated that only plain, unflavored milk without added sugars should be offered when milk is provided (Lott et al., 2019; Pérez-Escamilla et al., 2017). The ESPGHAN guideline document recommended limiting the intake of sweetened milk drinks such as smoothies or condensed milk and replacing sweetened milk products with water (Fidler Mis et al., 2017). Age groups were not specified in either ESPGHAN recommendation.

Consistency

The three guideline documents were consistent in recommending limiting or not providing flavored milk to infants and young children.

Evidence Base

Across the three guideline documents, the committee identified six statements of recommendation. The three recommendations that came from a single guideline document (Lott et al., 2019 [RWJF-HER]) mapped to previous reports and federal nutrition standards. Two recommendations from an ESPGHAN guideline document (Fidler Mis et al., 2017) mapped to a systematic literature search. The remaining recommendation from Pérez-Escamilla et al. (2017 [RWJF-HER]) mapped to a narrative review.

FLUIDS: WATER, JUICE, SUGAR-SWEETENED BEVERAGES, AND OTHER NONMILK BEVERAGES[17]

Seventeen guideline documents included recommendations regarding water, juice, sugar-sweetened beverages, and other nonmilk beverages (see

[17] This section does not include recommendations related to infant formulas. One recommendation on beverages containing low-calorie sweetener has been omitted from this section, but it is discussed in the "Substances to Avoid or Limit" section later in this chapter.

Appendix B, Table B-8). Six guideline documents were collaborative efforts between two or more organizations (AAPD, 2016; Health Canada et al., 2014, 2015; Lott et al., 2019; New Zealand Dental Association, 2008; PAHO/WHO, 2003). Eleven organizations participated in multiple guideline documents. Accordingly, the identified guideline documents reflect 17 different organizations from Australia, Canada, Europe, New Zealand, the United Kingdom, and the United States, along with PAHO and WHO.[18]

Water and Fluid Needs

Ten guideline documents included recommendations related to water and fluid needs. Recommendations varied by age of the infants and young children. For children younger than 6 months, two guideline documents made explicit recommendations related to water. A collaborative consensus statement from RWJF-HER specified that no additional water is needed (Lott et al., 2019); the other guideline document, from the New Zealand Ministry of Health, made a recommendation that strongly discouraged providing breastfed infants with water before 6 months (Ministry of Health, 2012). Three guideline documents—one each from AAP, the Australian government, and the New Zealand Ministry of Health—indicated that infants in this age range only need breast milk or infant formula, implying that water and other fluids are not necessary (Heyman et al., 2017; Ministry of Health, 2012; NHMRC, 2012).

A WHO guideline document recommended that nonbreastfed infants and young children receive "at least 400–600 mL/day of extra fluids (in addition to the 200–700 mL/day of water that is estimated to come from milk and other foods) in temperate climates and 800–1200 mL/day in hot climates" (WHO, 2005).[19] Similarly, a guideline document from the New Zealand Ministry of Health suggested that additional fluids may be required for formula-fed infants when they are unwell or the weather is hot (Ministry of Health, 2012).

Two guideline documents from RWJF-HER and one guideline document from SACN indicated that water was appropriate for infants 6–12 months of age (Lott et al., 2019; Pérez-Escamilla et al., 2017; SACN, 2018). The two guideline documents from RWJF-HER recommended half to 1 cup of plain water daily (Lott et al., 2019; Pérez-Escamilla et al., 2017).

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[18] Organizations reflected in the guideline documents include AAP, AAPD, AHA, AND, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, ESPGHAN, Health Canada, New Zealand Dental Association, New Zealand Ministry of Health, NHMRC, NICE, PAHO, RWJF-HER, SACN, and WHO.

[19] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Fluid Needs, p. 20, Copyright (2005).

Six guideline documents recommended that water be offered to children older than 1 year of age (Health Canada et al., 2014; Lott et al., 2019 [RWJF-HER]; Ministry of Health, 2012; New Zealand Dental Association, 2008; NICE, 2008; Pérez-Escamilla et al., 2017 [RWJF-HER]). Recommendations from RWJF-HER guideline documents slightly varied: one stated that 2 cups of water per day should be provided (Pérez-Escamilla et al., 2017), while the other recommended 1–4 cups of water per day, depending on the intake of other fluids (Lott et al., 2019).

Consistency

The guideline documents were consistent in discouraging the provision of water to infants 0–6 months of age; two guideline documents made exceptions for nonbreastfed infants related to climate. Fewer guideline documents made recommendations related to water intake of infants 6–12 months of age, but those that did were consistent. The guideline documents were consistent regarding the provision of water to children older than 1 year of age, although the recommended quantity varied.

Evidence Base

Across the 10 guideline documents, the committee identified 17 statements of recommendation. The majority of the recommendations mapped to narrative reviews, alone or in combination with other resources. One recommendation (NICE, 2008) was based on a UK Department of Health report (Department of Health, 1994) and a rapid review. One recommendation from the New Zealand Dental Association (2008) could not be mapped to its evidence.

Juice

Fifteen guideline documents included recommendations related to juice. Five guideline documents made specific recommendations for juice, eight guideline documents made recommendations for the combined topics of juice and sugar-sweetened beverages, and two guideline documents made recommendations both specific to juice and for the combination of juice and sugar-sweetened beverages. Eight of the corresponding recommendations referred to "fruit juice," 11 recommendations referred to just "juice" or "juices," 3 recommendations referred to "100% juice," and 1 recommendation referred to "baby juices." None of the recommendations mentioned vegetable juices.

Of the recommendations specific to infants 0–12 months, the most stringent said that "fruit juice is not necessary or recommended"

(NHMRC, 2012),[20] that juice "should be avoided" (Fewtrell et al., 2017 [ESPGHAN]), or that juice is "not recommended" (Lott et al., 2019 [RWJF-HER]). A 2005 guideline document from AHA stated that 100% juice should be delayed "until at least 6 months of age" and limited to no more than 4–6 ounces from a cup (Gidding et al., 2005). One guideline document from AAP indicated that juice should not be introduced until after 12 months of age "unless clinically indicated" (Heyman et al., 2017).

Four guideline documents included recommendations specific to toddlers. A guideline document from the New Zealand Ministry of Health stated that juice is not recommended for toddlers (Ministry of Health, 2012). In contrast, three guideline documents, one from AAP and two from RWJF-HER, recommended that juice intake should not exceed 4 ounces per day for children 1–3 years of age (Heyman et al., 2017; Lott et al., 2019; Pérez-Escamilla et al., 2017). Two of the guideline documents specified that juice should not be given in a bottle (Heyman et al., 2017; Pérez-Escamilla et al., 2017), and one specified that juice should not be provided at bedtime (Heyman et al., 2017).

Of the recommendations relevant to both infants and young children collectively, the more restrictive ones said to "avoid" juice (NHMRC, 2012), "do not give" juice (NHMRC, 2012), or that juice is "not recommended" (Ministry of Health, 2012). Other guideline documents used language such as "advise limiting" (Health Canada et al., 2014)[21] and "advise parents that juice … [is] not recommended" (New Zealand Dental Association, 2008). Other guideline documents suggested restricting the amount of juice. One guideline document from AAPD recommended that frequent consumption of juice in a baby bottle or no-spill cup should be avoided (AAPD, 2016); two other guideline documents advised limiting the amount of juice provided "to avoid displacing more nutrient-rich foods" (PAHO/WHO, 2003; WHO, 2005).[22,23] A guideline document from ESPGHAN recommended that sugar-containing beverages, including juice, be replaced with water (Fidler Mis et al., 2017). A NICE guideline document stated that parents and caregivers should not offer "baby juices" at bedtime and that *diluted* fruit juice (1 part juice to 10 parts water) can be

[20] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[21] © All rights reserved. *Nutrition for healthy term infants: Recommendations from six to 24 months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[22] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

[23] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 13, Copyright (2005).

provided with meals (NICE, 2008). An AAP guideline document indicated that "pediatricians should advocate for a reduction in fruit juice in the diets of young children and the elimination of fruit juice in children with abnormal (poor or excessive) weight gain" (Heyman et al., 2017). An AAPD guideline document did not offer its own recommendations (AAPD, 2017); rather, the organization supported the recommendations put forth by the AAP in a recent publication (Heyman et al., 2017).

Consistency

The language used to describe what type of juice was included in the recommendations varied across guideline documents. The guideline documents were generally consistent in stating that juice should not be provided in the first 12 months of life, although one guideline document suggested delaying introduction until at least 6 months of age (Gidding et al., 2005 [AHA]). Similarly, the recommendations specific to toddlers were generally consistent, indicating that juice intake should not exceed 4 ounces per day, although one guideline document stated that juice was not recommended (Ministry of Health, 2012). Broader recommendations that were applicable to both infants and toddlers had some inconsistencies, with some recommendations stating that juice should not be given, while other recommendations indicated that juice intake should be limited.

Evidence Base

Across the 15 guideline documents, the committee identified 23 statements of recommendation. Twelve of the recommendations mapped to narrative reviews or technical documents, either alone or in combination with other resources. One recommendation from the Australian government (NHMRC, 2012) mapped to a systematic review, whereas two recommendations from ESPGHAN (Fewtrell et al., 2017; Fidler Mis et al., 2017) mapped to systematic literature searches. Two recommendations from NICE (2008) mapped to a UK Department of Health report (Department of Health, 1994) and rapid reviews. The three recommendations that came from a single guideline document (Lott et al., 2019 [RWJF-HER]) mapped to a previous AAP report (Heyman et al., 2017) and the *Dietary Guidelines for Americans* (DGA). One guideline document (AAPD, 2017) supported a previous AAP report (Heyman et al., 2017). Two recommendations from two guideline documents (Giddings et al., 2005; New Zealand Dental Association, 2008) could not be mapped to their evidence.

Sugar-Sweetened Beverages

Twelve guideline documents included recommendations related to sugar-sweetened beverages. All but two of these documents also made recommendations for the combined topics of fruit juice and sugar-sweetened beverages. Recommendations used different terms to describe sugar-sweetened beverages, although most refer to either "sugar-sweetened beverages," "sugar sweetened drinks," "sugar-containing beverages," "sweet drinks," or "sweetened beverages." Some guideline documents used slightly different terms, including "soft drinks" and "cordials" (New Zealand Dental Association, 2008; NHMRC, 2012) and "sugary soft drinks" or "sugary drinks such as soda" (PAHO/WHO, 2003; WHO, 2005).[24,25] Six guideline documents provided examples of sugar-sweetened beverages (e.g., sports drinks, sweetened teas, sodas, sweetened milk drinks) (AAPD, 2016; Fidler Mis et al., 2017 [ESPGHAN]; Lott et al., 2019 [RWJF-HER]; New Zealand Dental Association, 2008; PAHO/WHO, 2003; Pérez-Escamilla et al., 2017 [RWJF-HER]).

Some of the recommendations relevant to infants indicated that sugar-sweetened beverages are drinks to "avoid" (Fewtrell et al., 2017 [ESPGHAN]; NHMRC, 2012) or "not offer" (NHMRC, 2012; Pérez-Escamilla et al., 2017); one guideline document stated that sugar-sweetened beverages are not recommended (Ministry of Health, 2012). A guideline document from ESPGHAN recommended replacing "sugar-containing beverages" with water; however, no age range was provided (Fidler Mis et al., 2017 [ESPGHAN]). One RWJF-HER guideline document stated that "[i]t is strongly recommended to offer *no* sugar-sweetened beverages" to infants (Pérez-Escamilla et al., 2017). A guideline document from AAPD stated that frequent consumption of sugar-sweetened beverages and other liquids containing sugar should be avoided (AAPD, 2016).

One recommendation in a collaborative guideline document from New Zealand indicated that sweet drinks are not recommended for toddlers (New Zealand Dental Association, 2008). Five additional guideline documents provided recommendations relevant to both infants and young children. Generally, they stated that sugar-sweetened beverages were "not recommended" (Lott et al., 2019 [RWJF-HER]; Ministry of Health, 2012) or should not be given (Ministry of Health, 2012; PAHO/WHO, 2003; WHO 2005). However, a recommendation in one collaborative guideline document from Canada was to "advise limiting" sweetened beverages (Health Canada et al., 2014). A NICE guideline document discouraged parents from offering sugary drinks at bedtime (NICE, 2008).

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[24] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

[25] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 13, Copyright (2005).

Consistency

The guideline documents were consistent in recommending against providing infants and young children with sugar-sweetened beverages, although one used slightly softer language ("advise limiting") (Health Canada et al., 2014).

Evidence Base

Across the 12 guideline documents, the committee identified 15 statements of recommendation. Most of the recommendations mapped to narrative reviews and/or technical background documents, either alone or in combination with other resources. One recommendation from the Australian government (NHMRC, 2012) mapped to a systematic review, whereas two recommendations from ESPGHAN guideline documents (Fewtrell et al., 2017; Fidler Mis et al., 2017) mapped to systematic literature searches. A recommendation from NICE (2008) mapped to a UK Department of Health report (Department of Health, 1994) and a rapid review. One recommendation from the New Zealand Dental Association (2008) could not be mapped to its evidence.

Coffee and Tea

Five guideline documents included recommendations that referred to coffee and tea. Two guideline documents stated that coffee and tea "are not recommended" (Lott et al., 2019 [RWJF-HER]; Ministry of Health, 2012). Four guideline documents said to "not offer" (NHMRC, 2012), "not give" (Ministry of Health, 2012), or "avoid giving" (PAHO/WHO 2003; WHO, 2005) coffee and tea. All but one included a reason that these beverages should not be offered. The reasons offered were that the beverages are "sweetened" (Lott et al., 2019 [RWJF-HER]), "caffeine-containing" or "containing caffeine" (Ministry of Health, 2012), or of "low nutrient value" (PAHO/WHO, 2003; WHO, 2005).[26,27] One recommendation described "tea, herbal teas, [and] coffee" as beverages that should not be offered (NHMRC, 2012), but it provided no further rationale. Notably, two guideline documents included "herbal teas" in their lists of beverages not to offer (Ministry of Health, 2012; NHMRC, 2012).

[26] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

[27] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 13, Copyright (2005).

Consistency

The guideline documents were consistent in recommending that coffee and tea should not be given to infants and young children.

Evidence Base

Across the five guideline documents, the committee identified six statements of recommendation. The recommendations mapped to narrative reviews, technical consultations, and/or a technical background document.

Caffeinated Beverages

Two guideline documents included recommendations that specifically referenced beverages that are "caffeinated" (Lott et al., 2019 [RWJF-HER]), "caffeine-containing" (Ministry of Health, 2012), or "containing caffeine" (Ministry of Health, 2012). The guideline document from the New Zealand Ministry of Health contained two recommendations indicating that caffeinated beverages are "not recommended" and caffeinated beverages should not be given to infants and toddlers (Ministry of Health, 2012). The other guideline document similarly stated that children 0–5 years of age should not consume caffeinated beverages (Lott et al., 2019 [RWJF-HER]).

Consistency

The two guideline documents that specifically referred to caffeinated beverages were consistent with each other, advising against the provision of such beverages to infants and young children.

Evidence Base

Across the two guideline documents, the committee identified three statements of recommendation that all mapped to narrative reviews.

Beverages of Low Nutrient Value

Two guideline documents included recommendations that referred to drinks with "low nutrient value" (PAHO/WHO, 2003; WHO, 2005).[28,29]

[28] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

[29] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 13, Copyright (2005).

In both, the recommendation was to "[a]void giving drinks with low nutrient value."

Consistency

The two guideline documents were consistent in the wording of their recommendation for infants and young children to avoid beverages with low nutrient value. However, one of the guideline documents was specific to nonbreastfed children 6–24 months of age (WHO, 2005) and the other was written for breastfed children (PAHO/WHO, 2003). Notably, both guideline documents were relevant to a global audience.

Evidence Base

Across the two guideline documents, the committee identified two statements of recommendation. One mapped to a technical background document and narrative review (WHO, 2005), and the other mapped to technical consultations and documents (PAHO/WHO, 2003).

Plant-Based Beverages

Six guideline documents included recommendations on plant-based beverages (Health Canada et al., 2014, 2015; Lott et al., 2019; Ministry of Health, 2012; NHMRC, 2012; Pérez-Escamilla et al., 2017). The guideline documents recommended against the use of plant-based beverages for infants except when specifically indicated and when a commercially prepared infant formula is available (e.g., soy-based formula). Plant-based beverages were not recommended for children older than 12 months, except in two instances. One guideline document, from the New Zealand Ministry of Health, stated: "For vegetarian and vegan toddlers, provide plenty of liquids each day as water, breast milk, cow milk, or plant-based milks only" (Ministry of Health, 2012).[30] The other, from the Australian government, recommended:

> Rice and oat milk can be used after 12 months, as long as a full-fat fortified variety (at least 100 mg calcium/100mL) is used and alternative forms of protein and vitamin B12 are included in the diet. These products are suitable when used under health professional supervision. (NHMRC, 2012)

[30] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

Consistency

The guideline documents were generally consistent in recommending that plant-based beverages should not be given to infants. Although several of the guideline documents had a similar position for children older than 12 months of age, two guideline documents identified circumstances under which such beverages could be provided (Ministry of Health, 2012; NHMRC, 2012).

Evidence Base

Across the six guideline documents, the committee identified nine statements of recommendation. Most of the recommendations mapped to narrative reviews.[31] Two recommendations from an RWJF-HER consensus guideline document (Lott et al., 2019) mapped to the DGA. One recommendation from the Australian government (NHRMC, 2012) could not be mapped to its evidence.

SUBSTANCES TO AVOID OR LIMIT[32]

Fourteen guideline documents included recommendations related to substances to avoid or limit (see Appendix B, Table B-9). Four guideline documents were collaborations between two or more organizations (AAPD, 2016; Health Canada et al., 2014; Lott et al., 2019; New Zealand Dental Association, 2008); six organizations participated in multiple guidelines. The identified guideline documents reflect 15 different organizations from Australia, Canada, Europe, New Zealand, the United Kingdom, and the United States.[33]

[31] Although Table B-8 in Appendix B notes that a recommendation from the Australian government (NHMRC, 2012) maps to both a systematic and narrative review, the portion related to plant-based milks only mapped to a narrative review.

[32] With the exception of the recommendation related to beverages containing low-calorie sweeteners, this section has not summarized recommendations related to beverages. Recommendations related to beverages are summarized in "Milk and Milk-Based Products" and "Fluids: Water, Juice, Sugar-Sweetened Beverages, and Other Nonmilk Beverages" sections earlier in this chapter. Furthermore, the committee considered recommendations related to avoiding honey in the first year of life due to the risk of botulism as a safety issue. Recommendations related to this topic are summarized in Chapter 5, "Safety of Foods and Feeding Practices."

[33] Organizations reflected in the guideline documents include AAP, AAPD, AHA, AND, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, ESPGHAN, Health Canada, New Zealand Dental Association, New Zealand Ministry of Health, NHMRC, NICE, RWJF-HER, and SACN.

Consuming Nonnutritive Sweeteners

Two guideline documents included recommendations related to nonnutritive sweeteners. One, a consensus statement from RWJF-HER, advised against providing beverages with low-calorie sweeteners to children 0–5 years of age (Lott et al., 2019). The other, an AAP guideline document, stated that there was inadequate evidence to make a recommendation regarding consumption of nonnutritive sweeteners by children under the age of 2 years (Baker-Smith et al., 2019).

Consistency

The guideline documents were not consistent in their recommendations related to nonnutritive sweeteners. However, in the rationale justifying the RWJF-HER recommendation, the guideline document noted that there is a dearth of evidence regarding health effects of beverages with low-calorie sweeteners in young children (Lott et al., 2019). A precautionary approach was taken based on expert opinion, resulting in a recommendation against consumption. Thus, the inconsistency in the recommendations appears to stem from different approaches to handling situations where there is inadequate evidence to make a recommendation.

Evidence Base

Across the two guideline documents, the committee identified two statements of recommendation. Both mapped to narrative reviews. In one case, the recommendation explicitly stated there was a lack of evidence (Baker-Smith et al., 2019 [AAP]), and in the other case, the lack of evidence for young children was mentioned in the rationale and the recommendation was based on expert opinion (Lott et al., 2019 [RWJF-HER]).

Limiting Consumption of Sugars

Two guideline documents included recommendations related to limiting consumption of sugars. One guideline document from AAPD recommended reducing sugar intake below 5–10 percent of children's total energy intake, with the lower bound recommended to prevent weight gain and dental caries (AAPD, 2017). Similarly, a guideline document from ESPGHAN recommended that intakes of free sugars for children younger than 2 years of age should be lower than the recommendation for older children, who are recommended to consume less than 5 percent of energy intakes from free sugars (Fidler Mis et al., 2017). The ESPGHAN guideline document also emphasized the importance of avoiding or limiting intakes of free sugars by infants.

Consistency

The two guideline documents were consistent in recommending that intake of sugars should be at most a small portion of total energy intake, but they provided slightly different targets. The recommendation from ESPGHAN was specific to infants and children under age 2; AAPD did not provide specific age ranges. AAPD noted that it was endorsing the recommendation of "national and international organizations."

Evidence Base

Across the two guideline documents, the committee identified two statements of recommendation. One recommendation from AAPD (2017) mapped to guidance from the DGA, WHO, and AHA; the other recommendation from ESPGHAN (Fidler Mis et al., 2017) mapped to a systematic literature search.

Preparing Foods Without Added Sugars

Seven guideline documents included recommendations related to not adding sugar to foods being prepared for infants (Fewtrell et al., 2017 [ESPGHAN]; Fidler Mis et al., 2017 [ESPGHAN]; Ministry of Health, 2012; NHMRC, 2012; NICE, 2008; Pérez-Escamilla et al., 2017 [RWJF-HER]) or toddlers or young children (Health Canada et al., 2014; Ministry of Health, 2012; NICE, 2008). Three guideline documents also mentioned not adding honey (Ministry of Health, 2012; NHMRC, 2012; NICE, 2008) or other sweeteners (Ministry of Health, 2012). Some guideline documents emphasized adding no sugar, particularly for infants (Fewtrell et al., 2017 [ESPGHAN]; Ministry of Health, 2012; NHMRC, 2012; NICE, 2008; Pérez-Escamilla et al., 2017 [RWJF-HER]). Recommendations for toddlers mentioned "little added sugar" (Ministry of Health, 2012) or "little or no added … sugar" (Health Canada et al., 2014)[34] or "without adding sugar" (NICE, 2008). One guideline document recommended discouraging parents from adding sugar to bottle feeds (NICE, 2008).

Consistency

The guideline documents were consistent in recommending that foods for infants and young children be prepared without added sugars, with an

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emphasis on no added sugar for infants and little to no added sugar for toddlers.

Evidence Base

Across the seven guideline documents, the committee identified 10 statements of recommendation. One recommendation from the Australian government (NHMRC, 2012) mapped to a systematic review, while two recommendations from ESPGHAN (Fewtrell et al., 2017; Fidler Mis et al., 2017) mapped to systematic literature searches. Three recommendations from NICE (2008) mapped to both a UK Department of Health report (Department of Health, 1994) and rapid reviews. The rest of the recommendations mapped to narrative reviews, either alone or in combination with other resources.

Offering Pre-Prepared Foods and Snacks with No or Limited Added or Total Sugars

Seven guideline documents included recommendations related to offering pre-prepared foods and snacks with no or limited added or total sugar to young children. The exact language for these recommendations was variable. For example, an RWJF-HER guideline document recommended choosing pre-prepared baby food "without (or with limited amounts of) added sugars," avoiding offering sweets or foods or snacks high in added sugars during the transition to family food, limiting toddler consumption of snacks with added sugars, and serving toddlers only plain yogurt or yogurt with no more than 23 grams of sugar per 6 ounces (Pérez-Escamilla et al., 2017). Similarly, a guideline document from the New Zealand Ministry of Health recommended selection of pre-prepared complementary foods with no added sugar, honey, or other sweeteners, and selection of foods and snacks that have little added sugar for toddlers (Ministry of Health, 2012). Others indicated the following:

- Frequent consumption of foods containing sugar should be avoided in early childhood (AAPD, 2016).
- Intake of all foods with added sugars should be limited and intake of "nutrient-poor discretionary foods" with high levels of added sugars should be avoided during the complementary feeding period (NHMRC, 2012).
- Foods low in sugar should be selected for 12–24-month-olds (New Zealand Dental Association, 2008).
- Giving young children sweets as treats should be avoided (NICE, 2008).

One organization (SACN, 2018) stated that it is necessary to reemphasize the risks associated with free sugars in complementary foods and to monitor reported intakes.

Consistency

Three guideline documents were consistent in recommending that preprepared foods and snacks offered to young children should contain no or limited added or total sugars, with some variability in the exact language used.

Evidence Base

Across the seven guideline documents, the committee identified 12 statements of recommendation. Most of the recommendations mapped to narrative reviews. Two recommendations from the Australian government (NHMRC, 2012) mapped to systematic reviews, while one from NICE (2008) mapped to both a UK Department of Health report (Department of Health, 1994) and to a rapid review.

Consuming Foods with Sugars at Mealtimes Instead of Snacks

Four guideline documents included recommendations related to timing of consumption of foods with sugars, if consumed. Three guideline documents recommended that if sugary foods are consumed, they should be eaten at meals instead of snacks (Fidler Mis et al., 2017 [ESPGHAN]; New Zealand Dental Association, 2008; NICE, 2008). One guideline document recommended that foods free of added sugar, such as fruits and vegetables, be encouraged between meals (NICE, 2008). Another guideline document specifically recommended that dried fruit not be given as a snack, however, because it is cariogenic (Ministry of Health, 2012).

Consistency

The guideline documents were consistent in recommending that if foods with sugars are consumed, they should be eaten at mealtimes instead of snacks. Fruits and vegetables were recommended as appropriate snacks, with the New Zealand Ministry of Health (2012) specifically identifying dried fruit as an exception.

Evidence Base

Across the four guideline documents, the committee identified five statements of recommendation. The recommendation from ESPGHAN

(Fidler Mis et al., 2017) mapped to a systematic literature search. Two recommendations from NICE (2008) mapped to both a UK Department of Health report (Department of Health, 1994) and rapid reviews. The recommendation from the New Zealand Ministry of Health (2012) mapped to the New Zealand Dental Association (2008) guideline document recommendation, which in turn mapped to a 2005 NHS Scotland guideline.

Dipping Pacifiers or Bottle Teats in Sugary Substances

Three guideline documents advised against dipping pacifiers or bottle teats in sugary substances, specifically mentioning sugar (Ministry of Health, 2012; New Zealand Dental Association, 2008; NHMRC, 2012), honey (Ministry of Health, 2012; New Zealand Dental Association, 2008; NHMRC, 2012), jam (NHMRC, 2012), and sweetened drinks (New Zealand Dental Association, 2008).

Consistency

The three guideline documents that had recommendations related to dipping pacifiers or bottle teats in sugary substances consistently recommended against the practice, with "sugar" and "honey" most frequently mentioned as specific examples.

Evidence Base

Across the three guideline documents, the committee identified three statements of recommendation. The recommendation from the New Zealand Ministry of Health (2012) mapped to the New Zealand Dental Association (2008) guideline document recommendation, which in turn mapped to an earlier 2008 New Zealand Ministry of Health guideline. The recommendation from the Australian government (NHMRC, 2012) could not be mapped to its evidence.

Preparing Foods Without Added Salt

Six guideline documents recommended not adding salt to foods being prepared for infants (Fewtrell et al., 2017 [ESPGHAN]; Ministry of Health, 2012; NHMRC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]) and toddlers and young children (Health Canada et al., 2014; Ministry of Health, 2012; NICE, 2008). Some organizations emphasized adding no salt (Fewtrell et al., 2017 [ESPGHAN]; Ministry of Health, 2012; NICE, 2008; Pérez-Escamilla et al., 2017 [RWJF-HER]), particularly for infants, with one guideline document specifying the rationale that immature infant

kidneys cannot excrete excess salt (NHMRC, 2012). Recommendations for toddlers mentioned food prepared with "little or no added salt" (Health Canada et al., 2014)[35] or "low in salt" (Ministry of Health, 2012). One guideline document from the New Zealand Ministry of Health specified that if salt is used in food preparation, it should be iodized salt (Ministry of Health, 2012). One additional guideline document from SACN (2018) stated that it is necessary to reemphasize the risks associated with added salt in complementary foods, and to monitor reported intakes.

Consistency

The guideline documents were consistent in recommending that foods for infants and young children be prepared without adding salt, with an emphasis on no added salt for infants and little to no added salt for toddlers.

Evidence Base

Across the six guideline documents, the committee identified seven statements of recommendation. The recommendation from the ESPGHAN guideline document (Fewtrell et al., 2107) mapped to a systematic literature search. The recommendation from the Australian government (NHMRC, 2012) mapped to a systematic review, although the supporting rationale for the recommendation (related to infant's inability to excrete excess salt) could not be mapped to its evidence. The NICE (2008) recommendation mapped to both a UK Department of Health report (Department of Health, 1994) and a rapid review. The remaining recommendations mapped to narrative reviews, either alone or in combination with other resources. The additional recommendation related to emphasizing the risk of sodium intake during the complementary feeding period (SACN, 2018) also mapped to a narrative review.

Offering Pre-Prepared Foods and Snacks with No or Limited Salt

Four guideline documents recommended offering pre-prepared foods and snacks with no or limited salt to young children. The exact language for these recommendations was somewhat variable. For example, an RWJF-HER guideline document recommended to choose pre-prepared baby food "without (or with limited amounts of) added salt," to avoid offering foods or snacks high

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in salt during the transition to family food, to limit toddler consumption of snacks high in sodium, and to avoid feeding toddlers foods that are high in sodium, with specific mention of processed meats, lunch meats, and packaged, breaded chicken and fish (Pérez-Escamilla et al., 2017). Other guideline documents recommended selection of pre-prepared complementary foods with no added salt (Ministry of Health, 2012), avoiding "nutrient-poor discretionary foods" with high levels of added salt during the complementary feeding period (NHMRC, 2012), and selection of foods and snacks that are low in salt for toddlers (Ministry of Health, 2012). A NICE guideline document recommended that foods free of salt, such as fruits and vegetables, be encouraged between meals (NICE, 2008).

Consistency

The guideline documents were consistent in recommending that pre-prepared foods and snacks offered to young children should have no or limited salt, with some variability in the exact language used.

Evidence Base

Across the four guideline documents, the committee identified nine statements of recommendation. The recommendation from the Australian government (NHMRC, 2012) mapped to a systematic review. The recommendation from the NICE (2008) guideline document mapped to both a UK Department of Health report (Department of Health, 1994) and a rapid review. The rest of the recommendations mapped to narrative reviews.

VARIETY AND HEALTHY, NUTRITIOUS FOODS

Ten guideline documents included recommendations related to healthy eating patterns, encompassing eating a variety of healthy, nutrient-dense foods within and across food groups (see Appendix B, Table B-10). Three of the guidelines were collaborative efforts between multiple organizations (Alvisi et al., 2015 [SIAIP and SIGENP]; Health Canada et al., 2014; PAHO/WHO, 2003); WHO contributed to two different guideline documents (PAHO/WHO, 2003; WHO, 2005). The identified guideline documents reflect 14 different organizations from Canada, Europe, Italy, New Zealand, the United Kingdom, and the United States, along with PAHO and WHO.[36]

[36] Organizations reflected in the guideline documents include AHA, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, ESPGHAN, Health Canada, New Zealand Ministry of Health, NICE, PAHO, RWJF-HER, SACN, SIAIP, SIGENP, and WHO.

Variety of Complementary Foods

Ten guideline documents included recommendations related to offering a variety of complementary foods. A number of aspects of dietary variety or diversity were addressed across the recommendations (see Table 4-1).

TABLE 4-1 Aspects of Dietary Variety or Diversity Mentioned in Recommendations from Eligible Guideline Documents

Organization(s)	Citation	Foods and Food Groups	Frequency of Food Groups	Nutritious Foods	Flavor	Texture	Variety in Amounts of Foods
AHA	Gidding et al., 2005			X			
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	X		X		X	
ESPGHAN	Fewtrell et al., 2017	X			X	X	
New Zealand Ministry of Health	Ministry of Health, 2012	X		X	X	X	X
NICE	NICE, 2008			X			
PAHO/WHO	PAHO/WHO, 2003	X	X				
RWJF-HER	Pérez-Escamilla et al., 2017	X	X	X			
SACN	SACN, 2018	X			X	X	
SIGENP; SIAIP	Alvisi et al., 2015	X	X	X			
WHO	WHO, 2005	X	X		X	X	

NOTE: AHA = American Heart Association; CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; HC = Health Canada; NICE = National Institute for Health and Care Excellence; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition; SIAIP = Italian Society of Pediatric Allergology and Immunology; SIGENP = Italian Society of Gastroenterology, Hepatology and Pediatric Nutrition; WHO = World Health Organization.

For recommendations on variety in foods, some guideline documents called attention to vegetables (Fewtrell et al., 2017 [ESPGHAN]; Ministry of Health, 2012; PAHO/WHO, 2003; Pérez-Escamilla et al., 2017 [RWJF-HER]; WHO, 2005). For instance, one guideline document from the New Zealand Ministry of Health recommended offering a "wide variety of vegetables and fruit including dark-green leafy vegetables … and yellow, red, and orange vegetables" (Ministry of Health, 2012).[37] Another guideline document, from ESPGHAN, suggested "including foods with different flavours and textures including bitter-tasting green vegetables" (Fewtrell et al., 2017).

Four documents made statements about the frequency of eating different food groups, including offering "healthy foods from the different food groups (fruits, vegetables, grains, proteins, dairy) at each meal" (Pérez-Escamilla et al., 2017 [RWJF-HER]); "meat, poultry, fish or eggs should be eaten daily, or as often as possible" (PAHO/WHO, 2003; WHO, 2005)[38,39]; and "daily consumption of fruits and vegetables" (Alvisi et al., 2015 [SIAIP and SIGENP]).[40]

Some guideline documents also recommended increasing variety to meet the nutritional needs of infants and toddlers. These include general statements about specific types of foods that contain fat (WHO, 2005), and specific statements on B vitamins or vitamin B12 (Ministry of Health, 2012; WHO, 2005), calcium (WHO, 2005), iron (Ministry of Health, 2012; WHO, 2005), vitamin A (PAHO/WHO, 2003; WHO, 2005), vitamin C (Ministry of Health, 2012; WHO, 2005), and zinc (Ministry of Health, 2012; WHO, 2005). In addition, one guideline document from the New Zealand Ministry of Health stated that "variety should be increased to ensure an additional intake of nutrients, especially energy, protein, iron, calcium, and vitamin B12" for vegetarian and vegan infants (Ministry of Health, 2012). Other documents describe nutritious foods as sources of specific nutrients. One collaborative guideline document stated "nutritious, higher-fat foods are an important source of energy for young children" (Health Canada et al., 2014).[41] Other relevant statements include "nutritious food that provides an adequate amount of protein (such as eggs, fish, meat) and energy" (Pérez-Escamilla et al., 2017 [RWJF-HER]), and "do

[37] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[38] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

[39] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 12, Copyright (2005).

[40] Alvisi et al., 2015, is licensed under CC BY 4.0 (http://creativecommons.org/licenses/by/4.0).

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not introduce foods without overall nutritional value simply to provide calories" (Gidding et al., 2005 [AHA]).

Some of the guideline documents made general statements about encouraging a variety of nutritious foods (NICE, 2008) or to "introduce healthy foods and continue offering if initially refused" (Gidding et al., 2005 [AHA]). One guideline document from SACN recommended taking the infant's developmental attainment and nutritional requirements into consideration (SACN, 2018). In four guideline documents, recommendations on what nutritious or healthy foods should be provided are combined with cautionary statements about foods to avoid, such as sugar-sweetened beverages, sweets, salty food and snacks, and fried food and snacks (Gidding et al., 2005 [AHA]; PAHO/WHO, 2003; Pérez-Escamilla et al., 2017 [RWJF-HER]; WHO, 2005).[42]

Consistency

The guideline documents were consistent in recommending a variety of nutritious foods and food groups, textures, and flavors, which can help meet nutritional requirements. There was variability in the level of specificity about foods, food groups, and nutrients across the recommendations.

Evidence Base

Across the 10 guideline documents, the committee identified 30 statements of recommendation. The majority of recommendations mapped to narrative reviews, background documents, and/or technical documents, either alone or in combination with other resources. A recommendation from ESPGHAN (Fewtrell et al., 2017) mapped to a systematic literature search. One recommendation from the NICE (2008) guideline document mapped to both a UK Department of Health report (Department of Health, 1994) and a rapid review.

FRUITS AND VEGETABLES

Eight guideline documents included recommendations related to feeding fruits and vegetables (see Appendix B, Table B-11). Two of the guideline documents were collaborative efforts between two organizations (Alvisi et al., 2015 [SIAIP and SIGENP]; PAHO/WHO, 2003); two guideline documents were from AAP (Baker et al., 2010; Heyman et al., 2017). Accordingly, the identified guidelines documents reflect nine different organizations

[42] Detailed summaries of recommendations on these related topics are found in "Fluids: Water, Juice, Sugar-Sweetened Beverages, and Other Nonmilk Beverages" and "Substances to Avoid or Limit."

from Europe, Italy, New Zealand, the United Kingdom, and the United States, along with PAHO and WHO.[43]

Variety, Frequency, and Types of Fruits and Vegetables

Eight guideline documents that included statements on variety, frequency, or types of fruits and vegetables varied in their specificity. Two guideline documents stated that children should be fed a variety of fruits and vegetables, and emphasized that children should eat dark-green leafy vegetables (Ministry of Health, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]). Guideline documents from AAP noted that children should be fed whole fruit (Heyman et al., 2017) and that children should eat foods rich in vitamin C to improve iron absorption (Baker et al., 2010). One guideline document from ESPGHAN recommended offering infants a varied diet that included bitter-tasting green vegetables (Fewtrell et al., 2017). A guideline document from PAHO/WHO stated that children should eat vitamin A–rich fruits and vegetables (PAHO/WHO, 2003).

Three guideline documents addressed the amount or frequency of consumption of fruits and vegetables. One guideline document stated that children should eat plenty of fruits and vegetables (Pérez-Escamilla et al., 2017 [RWJF-HER]). A guideline document from Italian pediatric societies recommended daily consumption of fruits and vegetables (Alvisi et al., 2015 [SIAIP and SIGENP]), whereas a guideline document from AAP recommended daily consumption of fruit (Heyman et al., 2010). A NICE (2008) guideline document recommended offering fruits and vegetables as snacks. The New Zealand Ministry of Health stated that dried fruits should not be offered as snacks because they can be cariogenic (Ministry of Health, 2012).

Consistency

The guideline documents were consistent in recommending consumption of a variety of fruits and vegetables, especially dark-green vegetables and orange- and red-colored fruits and vegetables. Guideline documents were consistent in recommending frequent or abundant fruit and vegetable consumption, but they varied with respect to the daily amount specified in the recommendation.

Evidence Base

Across the eight guideline documents, the committee identified 11 statements of recommendation. Most of the recommendations mapped

[43] Organizations reflected in the guideline documents include AAP, ESPGHAN, New Zealand Ministry of Health, NICE, PAHO, RWJF-HER, SIAIP, SIGENP, and WHO.

to narrative reviews or technical documents. The recommendation from ESPGHAN (Fewtrell et al., 2017) mapped to a systematic literature search. The recommendation on dried fruit in the New Zealand Ministry of Health (Ministry of Health, 2012) guideline document mapped to a 2008 New Zealand Dental Association guide. The recommendation from AAP (Baker et al., 2010) mapped to the Dietary Reference Intakes (DRIs) for iron. The recommendation from NICE (2008) mapped to both a UK Department of Health report (Department of Health, 1994) and a rapid review.

Acceptance of Vegetables

An RWJF-HER guideline document included statements on ways to help children accept vegetables (Pérez-Escamilla et al., 2017). Recommendations stated the importance of early introduction (once complementary feeding is started), repeated exposure, and mixing new vegetables with familiar foods.

Consistency

As only one guideline discussed acceptance of vegetables, no comment on consistency can be made.

Evidence Base

Within the RWJF-HER guideline document (Pérez-Escamilla et al., 2017), the committee identified three statements of recommendation. All recommendations mapped to a narrative review.

VEGETARIAN AND VEGAN DIETS

Nine guideline documents include recommendations related to vegetarian or vegan diets for infants and children under 2 years of age (see Appendix B, Table B-12). One of the guideline documents was an RWJF-HER consensus statement that included participants representing four organizations (Lott et al., 2019), two of which also provided their own guideline documents on the topic; one guideline document was a joint PAHO/WHO effort (PAHO/WHO, 2003). The identified guideline documents reflect 11 different organizations from Australia, Canada, Europe, New Zealand, and the United States, along with PAHO and WHO.[44]

[44] Organizations reflected in the guideline documents include AAP, AAPD, AHA, AND, CPS, ESPGHAN, New Zealand Ministry of Health, NHMRC, PAHO, RWJF-HER, and WHO.

Nutrient Adequacy of Vegetarian or Vegan Diets

Seven guideline documents included recommendations related to nutrient adequacy of vegetarian or vegan diets. Guideline documents from the Academy of Nutrition and Dietetics (AND) and CPS stated that an "appropriately planned" or "well-balanced" vegetarian diet is acceptable (Amit et al., 2010 [CPS]; AND, 2016), though both stipulated the need for attention to specific nutrients either in the recommendations themselves (Amit et al., 2010 [CPS]) or in the rest of the guideline document (AND, 2016). Four guideline documents made explicit cautionary statements about vegetarian or vegan diets. A guideline document from ESPGHAN cautioned against vegan diets, stating that they "should only be used under appropriate medical or dietetic supervision" and that "parents should understand the serious consequences of failing to follow advice regarding supplementation of the diet" (Fewtrell et al., 2017). Similarly, a guideline document from CPS commented on the need for fortified foods or supplements for infants on vegan diets (e.g., to meet calcium and vitamin B12 needs) (Amit et al., 2010). For nonbreastfed infants, a WHO guideline document stated that "diets that do not contain animal-source foods (meat, poultry, fish, or eggs, plus milk products) cannot meet all nutrient needs at this age unless fortified products or nutrient supplements are used" (WHO, 2005).[45] For breastfed infants, a PAHO/WHO guideline document stated that "vegetarian diets cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used" (PAHO/WHO, 2003).[46]

Four guideline documents mentioned specific nutrients of concern for vegetarian infants and young children in the recommendations (Amit et al., 2010 [CPS]; Fewtrell et al., 2017 [ESPGHAN]; Ministry of Health, 2012; NHMRC, 2012), and another mentioned key nutrients elsewhere in its guideline document (AND, 2016). In all four documents, iron was mentioned as a key nutrient. For instance, the statement from the Australian government guideline document said that "care needs to be taken particularly with a plant-based diet to ensure that supplies of iron are adequate" (NHMRC, 2012).[47] Other key nutrients mentioned in these recommendations are outlined in Table 4-2. Two guideline documents—one from CPS, the other from the New Zealand Ministry of Health—also provided recommendations about specific types of foods to include in vegetarian or vegan diets (Amit et al., 2010; Ministry of Health, 2012).

[45] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 12, Copyright (2005).

[46] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

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TABLE 4-2 Key Nutrients Included in Recommendations Related to Nutrient Adequacy of Vegetarian or Vegan Diets

Organization	Citation	Calcium	Energy	Folate	Iron	Protein	ALA/ LCPUFA	Vit. B12	Vit. D	Zinc
Australian government, NHMRC	NHMRC, 2012				X					
CPS	Amit et al., 2010	X	X		X	X	X	X	X	X
ESPGHAN	Fewtrell et al., 2017	X	X	X	X	X	X	X	X	X
New Zealand Ministry of Health	Ministry of Health, 2012	X	X		X	X		X		X
WHO	WHO, 2005	X			X					X

NOTE: ALA = alpha-linolenic acid; CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; LCPUFA = long-chain polyunsaturated fatty acids; NHMRC = National Health and Medical Research Council; Vit. = vitamin; WHO = World Health Organization.

Consistency

The guideline documents were consistent in stipulating the need for a carefully planned diet to meet requirements for several key nutrients, and somewhat inconsistent in whether they explicitly mentioned a need for fortified products or nutrient supplements for vegans.

Evidence Base

Across the seven guideline documents, the committee identified 20 statements of recommendation. Most recommendations mapped to narrative reviews, background documents, or technical documents. The recommendation from ESPGHAN (Fewtrell et al., 2017) mapped to a systematic literature search.

Use of Soy-Based Formulas for Nonbreastfed Infants When a Vegetarian or Vegan Diet Is Selected[48]

Two guideline documents—one from AAP and one from the New Zealand Ministry of Health—stated that for infants who are not breastfed or are partially breastfed, soy-based formulas are recommended when a

[48] Recommendations related to soy-based infant formula use are more broadly reviewed in the "Type of Infant Formula" section earlier in this chapter.

vegetarian or vegan diet is selected (Bhatia et al., 2008; Ministry of Health, 2012).

Consistency

The guideline documents were consistent in stating that soy-based formula is an appropriate choice for nonbreastfed infants whose caregivers choose a vegetarian diet.

Evidence Base

Across the two guideline documents, the committee identified three statements of recommendation that all mapped to narrative reviews.

Use of Plant-Based Beverages When a Vegetarian or Vegan Diet Is Selected[49]

Two guideline documents mentioned plant-based beverages for young children when a vegetarian or vegan diet is selected, one explicitly (Lott et al., 2019 [RWJF-HER]) and one implicitly (Ministry of Health, 2012). The recommendation from a collaborative consensus statement from RWJF-HER said that children 1–5 years of age should consume such beverages "only when medically indicated or to meet specific dietary preferences" (Lott et al., 2019). The recommendation from the New Zealand Ministry of Health stated that "for toddlers who do not have cow milk or milk products, calcium-fortified milk alternatives can provide calcium" (Ministry of Health, 2012).[50]

Consistency

The guideline documents were generally consistent in mentioning plant-based beverages as an option for toddlers in the context of specific dietary preferences, though with more cautionary language from the collaborative consensus statement from RWJF-HER (Lott et al., 2019).

Evidence Base

Across the two guideline documents, the committee identified three statements of recommendation. The New Zealand Ministry of Health (2012)

[49] Recommendations related to plant-based beverages are more broadly reviewed in the "Fluids and Nonmilk Beverages" section earlier in this chapter.

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recommendations mapped to narrative reviews. The collaborative consensus statement from RWJF-HER (Lott et al., 2019) mapped to the DGA.

FOODS ASSOCIATED WITH FOOD ALLERGY AND CELIAC DISEASE

Ten guideline documents included recommendations regarding the consumption of foods associated with food allergy and celiac disease (see Appendix B, Table B-13). Two of the guidelines were collaborative efforts among two organizations (Alvisi et al., 2015 [SIAIP and SIGENP]; SACN and COT, 2018). Two relevant guideline documents were identified for both ESPGHAN (Fewtrell et al., 2017; Szajewska et al., 2016) and SACN (SACN, 2018; SACN and COT, 2018). Accordingly, the identified guideline documents reflect 10 different organizations from Canada, Europe, Italy, the United Kingdom, and the United States.[51]

Allergenic Foods in General and Relationship to Food Allergy

Six guideline documents made a general recommendation that the introduction of allergenic complementary foods should not be delayed in order to prevent food allergy (atopic disease). There were slight variations in the recommended age of introduction across the guideline documents. An ESPGHAN guideline document recommended introduction any time "after 4 months (17 weeks)" (Fewtrell et al., 2017). An RWJF-HER guideline document recommended that common allergenic foods could be introduced when the infant "is ready to eat solid food (usually between 4 and 6 months of age)" (Pérez-Escamilla et al., 2017). Similarly, the AAP guideline document recommended not delaying introduction beyond 4–6 months of age (Greer et al., 2019). Both a CPS guideline document and a SACN and COT guideline document recommended introduction at about 6 months of age (Abrams et al., 2019; SACN and COT, 2018). A collaborative guideline document from Italian pediatric societies recommended not to delay introducing potentially allergenic foods, but it did not specify age of introduction (Alvisi et al., 2015).

Some of the guideline documents included guidance on how to introduce potentially allergenic foods. A guideline document from CPS recommended introducing allergenic foods one at a time and continuing these several times per week if they were tolerated (Abrams et al., 2019). Both

[51] Organizations reflected in the guideline documents include AAP, COT, CPS, ESPGHAN, NIH/NIAID, RCPCH, RWJF-HER, SACN, SIAIP, and SIGENP. The committee notes that one of the references (Togias et al., 2017) had a coordinating committee with members representing 25 professional organizations, along with a 26-member expert panel.

the SACN and COT (2018) guideline document and an RWJF-HER (Pérez-Escamilla et al., 2017) guideline document recommended consulting a physician regarding timing of introduction of allergenic foods if there were a family history of food allergy. The RWJF-HER guideline document also recommended introducing allergenic foods after other solids foods were tolerated (Pérez-Escamilla et al., 2017).

Consistency

The guideline documents were consistent in recommending that the introduction of allergenic foods as complementary foods not be delayed, although there was some variation in the recommended timing of introduction.

Evidence Base

Across the six guideline documents, the committee identified 12 statements of recommendation. Two recommendations from the SACN and COT (2018) guideline document mapped to a systematic review, whereas one recommendation from an ESPGHAN (Fewtrell et al., 2017) guideline document mapped to a systematic literature search. Three recommendations from the RWJF-HER guideline document (Pérez-Escamilla et al., 2017) mapped to the American Academy of Allergy, Asthma & Immunology (AAAAI) (2015) and the Australasian Society of Clinical Immunology and Allergy (ASCIA) (2016). One recommendation from the AAP guideline document (Greer et al., 2019) and one recommendation from the Italian pediatric societies (Alvisi et al., 2015) mapped to narrative reviews. One of the recommendations from the CPS guideline document (Abrams et al., 2019) mapped to a narrative review; however, three statements of recommendation in that guideline document could not be mapped to evidence.

Peanut-Containing Food and Peanut Allergy

Five guideline documents included specific recommendations about timing of introduction of peanut-containing foods and peanut allergy. All of the recommendations referred to the Learning Early About Peanut Allergy (LEAP) trial (Du Toit et al., 2015). One of these guideline documents, a National Institute of Allergy and Infectious Diseases (NIAID)-sponsored expert panel report (Togias et al., 2017), made specific recommendations for timing of introduction of peanuts based on three levels of risk. For the highest-risk infants (infants with severe eczema and/or egg allergy), the NIAID-sponsored expert panel recommended that peanuts should be introduced between 4 and 6 months of age. For infants with mild to

moderate eczema, the NIAID-sponsored expert panel recommended that peanut-containing foods should be introduced at around 6 months of age. Infants at low risk for peanut allergy (no eczema or food allergy) could have peanut-containing foods "freely introduced in the diet together with other solid foods and in accordance with family preferences and cultural practices" (Togias et al., 2017). In its 2019 guideline document, AAP (Greer et al., 2019) directly endorsed the NIAID recommendations (Togias et al., 2017). An ESPGHAN guideline document recommended that for infants at high risk for peanut allergy (defined by the LEAP trial), peanuts should be introduced between 4 and 11 months (Fewtrell et al., 2017). Two of the guideline documents recommended introduction of peanuts at 6 months of age without regard to risks (SACN, 2018; SACN and COT, 2018); both also stated that delaying the introduction of peanuts beyond 6–12 months may increase the risk of peanut allergy.

Consistency

The guideline documents were not consistent in recommending when and how to introduce peanuts based on the infant's risk for peanut allergy. There was consistency among the recommendations from NIAID (Togias et al. 2017), AAP (Greer et al., 2019), and ESPGHAN (Fewtrell et al., 2017). The recommendations from SACN (2018) and SACN and COT (2018) guideline documents were consistent with each other, but not with the other three guideline documents, particularly with respect to timing of introducing peanuts based on the risk of peanut allergy.

Evidence Base

Across the five guideline documents, the committee identified eight statements of recommendation. The NIAID recommendations (Togias et al., 2017), which were endorsed by AAP (Greer et al., 2019), were based on the LEAP trial for the highest-risk infants and evidence from the LEAP trial and the Enquiring About Tolerance trial (Perkin et al., 2016) and expert opinion for moderate- and low-risk infants. Two recommendations from the SACN and COT guideline document (2018) mapped to systematic reviews, whereas one recommendation from the ESPGHAN guideline document (Fewtrell et al., 2017) mapped to a systematic literature search. The SACN (2018) recommendation mapped to a narrative review.

Eggs and Egg Allergy

Three guideline documents included specific recommendations related to the introduction of eggs and egg allergy. Though AAP recommended earlier

rather than later introduction of eggs, it stated that the evidence for preventing atopic disease (food allergy) was less clear compared to evidence for introducing peanuts (Greer et al., 2019). Both the SACN (2018) and SACN and COT (2018) guideline documents recommended introduction of eggs "around 6 months of age." Both guideline documents also noted that the deliberate exclusion of eggs beyond 6–12 months of age may increase the risk of egg allergy.

Consistency

The guideline documents were generally consistent in recommending that introduction of eggs not be delayed, although the specific recommended age of introduction varied slightly.

Evidence Base

Across the three guideline documents, the committee identified five statements of recommendation. The two recommendations from the SACN and COT (2018) guideline document mapped to a systematic review. The recommendations from the AAP (Greer et al., 2019) and SACN (2018) guideline documents mapped to narrative reviews.

Other Specific Allergenic Foods[52] and Food Allergies

Two guideline documents included specific recommendations about the consumption of allergenic foods, other than eggs or peanuts. The RWJF-HER guideline document stated that dairy products (e.g., yogurt, cow milk protein formula), soy, wheat, fish, and shellfish can be introduced between 4 and 6 months of age (Pérez-Escamilla et al., 2017). An AAP guideline document stated that there was no evidence to delay the introduction of fish beyond 4–6 months of age to prevent atopic disease (food allergy) (Greer et al., 2019).

Consistency

The guideline documents were consistent with respect to their recommendations related to the introduction of fish between 4 and 6 months of age and food allergy. The RWJF-HER document, however, had a more extensive list of other potential allergenic foods.

[52] Other than eggs or peanuts.

Evidence Base

Across the two guideline documents, the committee identified two statements of recommendation. The recommendation from the RWJF-HER guideline document (Pérez-Escamilla et al., 2017) was cited as coming from AAAAI (2015) and ASCIA (2016). The recommendation from AAP (Greer et al., 2019) mapped to a narrative review.

Gluten-Containing Foods and Celiac Disease

Three guideline documents included recommendations related to the introduction of gluten-containing foods and celiac disease. A guideline document from Italian pediatric societies stated that "there is no ideal timing for gluten introduction in relation with the onset of celiac disease" (Alvisi et al., 2015).[53] Two ESPGHAN guideline documents stated that gluten-containing foods can be introduced between 4 and 12 months of age but to avoid large amounts of gluten during the first weeks or months after gluten introduction and during infancy (Fewtrell et al., 2017; Szajewska et al., 2016). The 2016 ESPGHAN guideline document, which was specific for gluten-containing foods and the relationship to celiac disease or celiac disease autoimmunity, also stated that introduction of gluten while breastfeeding does not reduce the risk of celiac disease and recommendations for breastfeeding should not be modified based on the prevention of celiac disease (Szajewska et al., 2016).

Consistency

The guideline documents were generally consistent regarding the introduction of gluten-containing foods and risk of celiac disease. The recommendations either indicated that there was no ideal timing or offered a broad range of ages (4–12 months) for introduction of gluten.

Evidence Base

Across the three guideline documents, the committee identified six statements of recommendation. The four recommendations from Szajewska et al. (2016 [ESPGHAN]) mapped to a systematic review, whereas one recommendation from Fewtrell et al. (2017 [ESPGHAN]) mapped to a systematic literature search. The recommendation from the Italian pediatric societies guideline document (Alvisi et al., 2015) mapped to a narrative review.

[53] Alvisi et al., 2015, is licensed under CC BY 4.0 (http://creativecommons.org/licenses/by/4.0).

Foods That May Prevent Food Allergy

Two guideline documents included recommendations as to whether breastfeeding or the use of hydrolyzed formulas influences risk of food allergy (Greer et al., 2019; Pérez-Escamilla et al., 2017 [RWJF-HER]). The AAP guideline document stated that "no conclusions can be made about the role of any duration of breastfeeding in either preventing or delaying the onset of specific food allergies" (Greer et al., 2019). Both the AAP and RWJF-HER guideline documents stated that the feeding of either partially or extensively hydrolyzed formulas will not prevent food allergy.

Consistency

Only one guideline document addressed the relationship between breastfeeding and prevention of food allergies. As such, no statement about consistency can be made. Two guideline documents were consistent in stating that partially or extensively hydrolyzed formulas would not prevent food allergies.

Evidence Base

Across the two guideline documents, the committee identified four statements of recommendations. The recommendation from the RWJF-HER guideline document (Pérez-Escamilla et al., 2017) was cited as coming from AAAAI (2015) and ASCIA (2016). The three recommendations from the AAP guideline document (Greer et al., 2019) mapped to a narrative review.

IRON

Seventeen guideline documents included recommendations regarding iron intake in the first 2 years of life (see Appendix B, Table B-14). One of the guideline documents was a collaborative effort among four organizations (Health Canada et al., 2015). Three organizations participated in multiple guideline documents: AAP (AAP Section on Breastfeeding, 2012; Baker et al., 2010), CPS (Amit et al., 2010; Grueger et al., 2013; Health Canada et al., 2015; Unger et al., 2019), and ESPGHAN (Domellöf et al., 2014; Fewtrell et al., 2017; Hojsak et al., 2018). The identified guideline documents reflect 14 different organizations from Australia, Canada, Europe, New Zealand, the United Kingdom, and the United States, along with WHO.[54]

[54] Organizations reflected in the guideline documents include AAFP, AAP, ABM, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, EFSA, ESPGHAN, Health Canada, New Zealand Ministry of Health, NHMRC, RWJF-HER, SACN, and WHO.

Iron-Rich Complementary Foods

Fourteen guideline documents included recommendations related to iron-rich complementary foods. Seven guideline documents from six organizations recommended introducing iron-rich foods at 6 months of age (AAP Section on Breastfeeding, 2012; Baker et al., 2010 [AAP]; Domellöf et al., 2014 [ESPGHAN]; SACN, 2018; Taylor and ABM, 2018; Unger et al., 2019 [CPS]; WHO, 2005). A guideline document from RWJF-HER recommended introducing iron-rich complementary foods at 4–6 months (Pérez-Escamilla et al., 2017).

Two of the guideline documents related the timing of introducing iron-rich foods to an infant's risk for iron deficiency or depletion. A CPS guideline document recommended that the introduction of iron-rich complementary foods between 4 and 6 months could be considered when there is high risk for iron deficiency anemia and the infant is developmentally ready (Unger et al., 2019). Similarly, a European Food Safety Authority (EFSA) guideline document suggested introduction of complementary foods as a source of iron before 6 months of age in infants at risk for iron depletion, including "exclusively breastfed infants born to mothers with low iron status, or with early umbilical cord clamping (less than 1 minute after birth)" (EFSA Panel on Nutrition et al., 2019).

Some guideline documents were less specific about the timing of introducing iron-rich complementary foods. Recommendations in guideline documents from ESPGHAN (Fewtrell et al., 2017), a collaborative effort among four Canadian organizations (Health Canada et al., 2015), AAFP (2014), CPS (Grueger et al., 2013), and the Australian government (NHMRC, 2012) did not specify an age for introducing iron-rich complementary foods. Only two guideline documents specifically recommended iron-rich foods for toddlers 12–24 months (Baker et al., 2010 [AAP]; WHO, 2005).

Consistency

The guideline documents were consistent in acknowledging the need to introduce iron-rich complementary foods, but they were not consistent in the recommended age of introduction. Most of the guideline documents recommended introducing iron-rich foods at 6 months. The RWJF-HER guideline document recommended the introduction of iron-rich foods at 4–6 months of age dependent on when the infant was developmentally ready for complementary food (Pérez-Escamilla et al., 2017). Two guideline documents recommended introduction before 6 months for infants at risk for iron depletion. Several of the recommendations underscored the importance of iron-rich complementary foods but did not specify timing of introduction. Only two guideline documents noted the importance of iron-rich foods for children older than 1 year of age.

Evidence Base

Across the 14 guideline documents, the committee identified 19 statements of recommendation. The majority of the recommendations mapped to narrative reviews and background documents. For one recommendation from ABM (Taylor and ABM, 2018), the type of literature review supporting the guidance was unclear. One recommendation from the EFSA guideline document (EFSA Panel on Nutrition et al., 2019) and two recommendations from the Australian government (NHMRC, 2012) mapped to systematic reviews, either alone or in combination with other resources. One recommendation from an ESPGHAN guideline document (Fewtrell et al., 2017) mapped to a systematic literature search. One recommendation from the AAFP (2014) guideline document mapped to an AAP statement. Three recommendations from two AAP guideline documents (AAP Section on Breastfeeding, 2012; Baker et al., 2010) could not be mapped to their evidence.

Iron-Fortified Formulas

Six guideline documents included recommendations related to iron-fortified formulas. Five guideline documents included recommendations supporting the use of iron-fortified infant formula for formula-fed infants, versus formula not fortified with iron, though the recommended duration of use varied. Recommendations from RWJF-HER (Pérez-Escamilla et al., 2017), NHMRC (2012), and AAP (Baker et al., 2010) encouraged the use of iron-fortified formulas until 12 months of age. In contrast, a CPS guideline document recommended use "for the first 9 to 12 months" (Unger et al., 2019), and an ESPGHAN guideline document recommended use "until up to 6 months" (Domellöf et al., 2014). Domellöf et al. (2014) further noted that after 6 months of age, formula-fed infants should receive additional iron in the formula, but that the high amounts currently used in European standard infant formulas (up to 8.5 mg/L) cannot be justified for use in the second 6 months of life compared to the lower amounts typically found in follow-on formulas.

Three organizations specified the suggested iron concentration for infant formulas. A CPS guideline document recommended that formulas contain 6.5–13 mg/L (Unger et al., 2019). An ESPGHAN guideline document recommended that formulas contain 4–8 mg/L of iron (Domellöf et al., 2014), and AAP recommended 10–12 mg/L (Baker et al., 2010). One guideline document recommended against the use of low-iron formulas, defined as those with iron content less than 6.7 mg/L (Pérez-Escamilla et al., 2017 [RWJF-HER]).

One guideline document from ESPGHAN stated that iron-fortified formula (rather than a formula not fortified with iron) for children 1–3 years

of age can be used to increase iron intake but there is no necessity for these young children formulas (Hojsak et al., 2018). An earlier ESPGHAN statement noted that follow-on formulas should be iron fortified, but that the optimal iron concentration could not be determined (Domellöf et al., 2014).

Consistency

The guideline documents were consistent in recommending iron-fortified formula (as compared to unfortified formula) for formula-fed infants. There were some inconsistencies in the specified age range to which this applied (once formula is introduced), ranging from the first 6 months of age to the first 12 months of age. There were also some inconsistencies among the three guideline documents that made recommendations for the iron content of infant formula, with suggested content varying from 4 to 13 mg/L. One guideline document recommended against the use of low-iron formula (Pérez-Escamilla et al., 2017 [RWJF-HER]).

Evidence Base

Across the six guideline documents, the committee identified eight statements of recommendation. Most of the recommendations mapped to narrative reviews. One recommendation from the Australian government (NHMRC, 2012) mapped to a systematic review, whereas one recommendation from an ESPGHAN guideline document (Hojsak et al., 2018) mapped to a systematic literature review.

Medicinal Iron Supplements

Seven guideline documents included recommendations regarding the use of medicinal iron supplements. A guideline document from AAP (Baker et al., 2010) recommended general use of an iron supplement (1 mg/kg/day) for all exclusively breastfed and partially breastfed infants beginning at 4 months of age and continuing until age-appropriate iron-containing complementary foods are introduced in the diet. Two other recommendations from the AAP guideline document (Baker et al., 2010) recommended targeted iron supplements for infants between 6 and 12 months and children between 1 and 3 years of age with inadequate iron intake. An ABM guideline document recommended that if iron supplementation is given before 6 months of age, 1 mg/kg/day should be given until iron-fortified cereals or other iron-rich foods are introduced into the diet (Taylor and ABM, 2018). For nonbreastfed children, WHO (2005) recommended use of fortified foods or vitamin mineral supplements that contain iron (8–10 mg/day at 6–12 months), as needed.

Four guideline documents did not recommend general use of iron supplements: CPS (Unger et al., 2019), ESPGHAN (Domellöf et al., 2014), New Zealand Ministry of Health (Ministry of Health, 2012), and SACN (2018); however, all included qualifications that may account for some of the inconsistency with the earlier 2010 AAP recommendation (Baker et al., 2010). For instance, the 2012 guideline document from the New Zealand Ministry of Health recommended iron supplements for infants and toddlers if there is a diagnosis of iron deficiency or if there has been exclusive breastfeeding for a prolonged period (Ministry of Health, 2012). An ESPGHAN guideline document recommended no general iron supplementation for healthy European infants and toddlers of normal birthweight, but it also recommended that delayed cord clamping be considered for all infants (Domellöf et al., 2014). This narrative summary also noted that iron supplementation may be provided to infants "from high-risk groups (low socioeconomic status or living in areas with high prevalence of [iron deficiency anemia]) if the infant has a low intake of iron-rich complementary foods" (Domellöf et al., 2014). The SACN guideline document recommended delayed cord clamping for all infants (SACN, 2018), and the narrative review also noted the importance of normal maternal iron status and adequate fetal iron stores. The most recent CPS guideline document recommended no iron supplementation for healthy term infants with no risk factors who are exclusively breastfed for 6 months, but it promoted delayed cord clamping in the narrative review to reduce iron deficiency (Unger et al., 2019).

Two organizations made recommendations for iron supplements for toddlers 12–24 months of age. For nonbreastfed children, WHO (2005) recommended use of fortified foods or vitamin mineral supplements, 5–7 mg/day at 12–24 months, as needed. An AAP guideline document recommended that for toddlers (12–36 months) not receiving an intake of 7 mg/day of iron from foods, liquid supplements could be used (Baker et al., 2010).

Consistency

The guideline documents were generally consistent in recommending against general iron supplementation of infants, with qualifications for infants with potential risks for iron deficiency. The one exception, a 2010 AAP recommendation for general iron supplements starting at 4 months of age for exclusively breastfed infants (Baker et al., 2010), was written before delayed cord clamping was recommended in the United States and was a general recommendation without regard for risks. AAP (Baker et al., 2010) and WHO (WHO, 2005) were the only organizations that addressed the potential need for iron supplements for children 12–24 months of age, and these were consistent.

Evidence Base

Across the seven guideline documents, the committee identified nine statements of recommendation. The majority of recommendations mapped to narrative reviews, alone or in combination with other resources. The AAP recommendation (Baker et al., 2010) regarding general supplementation starting at 4 months for exclusively breastfed infants mapped to a citation for a double-blind, randomized controlled trial on iron supplementation (Friel et al., 2003), whereas the recommendation for partially breastfed infants mapped to a narrative review. The other two recommendations in Baker et al. (2010) regarding targeted use of iron supplements for those whose dietary intake is low mapped to the iron DRIs. For one recommendation from ABM (Taylor and ABM, 2018), the type of literature review supporting the guidance was unclear.

Iron Intake of Vegetarian or Vegan Infants[55]

Five guideline documents noted the importance of adequate intake of (bioavailable) iron for vegetarian and vegan infants (Amit et al., 2010 [CPS]; Fewtrell et al., 2017 [ESPGHAN]; Ministry of Health, 2012; NHMRC, 2012; WHO, 2005). The ESPGHAN recommendation did not provide guidance on the source of the iron (Fewtrell et al., 2017), whereas guideline documents from the Australian government (NHMRC, 2012), CPS (Amit et al., 2010), the New Zealand Ministry of Health (Ministry of Health, 2012), and WHO (2005) indicated that iron-rich foods or iron supplements may be used. The New Zealand Ministry of Health also recommended that a source of vitamin C should be added to the diet to improve iron absorption (Ministry of Health, 2012).

Consistency

The guideline documents were consistent in underscoring the importance of adequate iron intake among vegetarian and vegan infants, although not all of them described the recommended sources of iron. Only one guideline document included a recommendation that emphasized vitamin C intake to enhance iron absorption (Ministry of Health, 2012).

Evidence Base

Across the five guideline documents, the committee identified six statements of recommendation. All recommendations mapped to narrative reviews,

[55] For a more in-depth exploration of related recommendations, see the "Vegetarian and Vegan Diets" section earlier in this chapter.

alone or in combination with other resources, except one from ESPGHAN (Fewtrell et al., 2017), which mapped to a systematic literature search.

VITAMIN D

Twelve guideline documents included recommendations related to vitamin D (see Appendix B, Table B-15). Two of the guideline documents were collaborative efforts among the same four organizations (Health Canada et al., 2014, 2015). Furthermore, CPS and the New Zealand Ministry of Health provided multiple guideline documents that contained vitamin D–related recommendations. The identified guideline documents reflect 10 different organizations from Canada, Europe, New Zealand, the United Kingdom, and the United States.[56]

Vitamin D Supplementation for Breastfed Infants

Nine guideline documents included vitamin D–related recommendations for breastfed infants. The levels of vitamin D supplementation recommended were 340–400 IU/day (SACN, 2018), 400 IU/day (Golden et al., 2014; Health Canada et al., 2014, 2015; Pérez-Escamilla et al., 2017), or 400–800 IU/day (Taylor and ABM, 2018). Although a CPS guideline document recommended vitamin D supplementation, no specific dose was given (Grueger et al., 2013). In contrast, a 2013 New Zealand Ministry of Health guideline document recommended vitamin D supplementation (400 IU/day) for breastfed or partially breastfed infants (who receive less than 500 mL of formula/day) only if they are at high risk for vitamin D deficiency (Ministry of Health, 2013); the recommendation further noted that if supplementation is used, it should not be used until breastfeeding is established (Ministry of Health, 2013). A 2012 New Zealand Ministry of Health guideline document stated that it did not support the use of routine vitamin D supplements for breastfed infants, except for infants and toddlers at risk for vitamin D deficiency (Ministry of Health, 2012). An AAP guideline document stated

> Because human milk contains inadequate amounts of vitamin D (unless the lactating mother is taking supplements of approximately 6,000 IU/day), breastfed and partially breastfed infants should be supplemented with 400 IU of vitamin D per day beginning in the first few days of life and continued until the infant has been weaned and is drinking at least 1 L/day of vitamin D-fortified infant formula or cow milk. (Golden et al., 2014)

[56] Organizations reflected in the guideline documents include AAP, ABM, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, ESPGHAN, Health Canada, New Zealand Ministry of Health, RWJF-HER, and SACN.

Consistency

The guideline documents were generally consistent in recommending vitamin D supplementation for breastfed infants. When provided, the suggested dose was generally consistent, at ~400 IU/day, although there was some variation in range. The New Zealand Ministry of Health (2012, 2013) was the only organization that recommended against supplementation of exclusively or partially breastfed infants and toddlers, unless they were at high risk for vitamin D deficiency.

Evidence Base

Across the nine guideline documents, the committee identified 10 statements of recommendation. Most recommendations mapped to narrative reviews. One recommendation from an AAP guideline document (Golden et al., 2014) mapped to the vitamin D DRIs. For one recommendation from ABM (Taylor and ABM, 2018), the type of literature review supporting the guidance was unclear.

Vitamin D Supplementation and Formula-Fed Infants

Two guideline documents included recommendations specifically for formula-fed infants. The guideline document from SACN (2018) recommended vitamin D supplements (without specifying a dose) if infants are receiving less than 500 mL/day of formula. A guideline document from RWJF-HER noted that a doctor may advise vitamin D supplementation for formula-fed infants receiving less than 1,000 mL/day of formula (Pérez-Escamilla et al., 2017).

Consistency

The guideline documents were consistent in relating the need for vitamin D supplementation to the total amount of daily infant formula intake. However, the guideline documents were not consistent regarding the amount of infant formula intake that necessitated vitamin D supplementation.

Evidence Base

Across the two guideline documents, the committee identified two statements of recommendation. Both mapped to narrative reviews.

Vitamin D Supplementation Independent of Breastfeeding Status

Three guideline documents included recommendations related to vitamin D for infants 0–12 months without regard to their breastfeeding status.

Universal supplementation of infants with 400 IU/day of vitamin D was recommended in ESPGHAN and CPS guideline documents (Braegger et al., 2013; Godel et al., 2007). The New Zealand Ministry of Health recommended vitamin D supplementation for infants at high risk for vitamin D deficiency (Ministry of Health, 2012). The CPS guideline also specified a higher dose (800 IU/day) "between October and April north of the 55th parallel (approximate latitude of Edmonton) and between the 40th and 55th parallel in individuals with risk factors for vitamin D deficiency other than latitude alone" (Godel et al., 2007).

Consistency

The guideline documents that provided vitamin D recommendations for infants independent of breastfeeding status were not consistent for either universal supplementation or supplementation for infants at risk for vitamin D deficiency.

Evidence Base

Across the three guideline documents, the committee identified three statements of recommendation that all mapped to narrative reviews.

Vitamin D Supplementation for Children 12–24 Months of Age

Four guideline documents included recommendations related to vitamin D supplementation for children 12–24 months of age. An ESPGHAN guideline document recommended supplementation only for high-risk children (Braegger et al., 2013). Similarly, the New Zealand Ministry of Health recommended supplementation for toddlers at risk for vitamin D deficiency (Ministry of Health, 2012). Neither recommended a vitamin D dose. A guideline document from CPS stipulated 400 IU/day of vitamin D as a supplement for infants, children, and adolescents taking in less than 500 mL of vitamin D–fortified milk and 800 IU/day for children with a high-risk profile for vitamin D deficiency (Amit et al., 2010). One guideline document recommended 400 IU/day of vitamin D for breastfed children 12–24 months of age (Health Canada et al., 2014).

Consistency

The guideline documents were consistent in recommending vitamin D supplementation for children 12–24 months of age based on the child's vitamin D risk status. How high risk for vitamin D deficiency was defined varied by recommendation. Both Health Canada and CPS recommended a

supplemental dose of 400 IU/day of vitamin D for at-risk children between 12 and 24 months of age (Amit et al., 2010; Health Canada et al., 2014).

Evidence Base

Across the four guidelines, the committee identified five statements of recommendation that all mapped to narrative reviews.

IODINE

Two guideline documents included recommendations related to iodine (see Appendix B, Table B-16). The guideline documents were from the New Zealand Ministry of Health (2012) and WHO (WHO Secretariat et al., 2007).

Iodine Supplementation

The two guideline documents included recommendations regarding iodine supplementation. Both recommended against the use of iodine supplements (Ministry of Health 2012; WHO Secretariat et al., 2007); the New Zealand Ministry of Health (2012) stated that medical supervision was necessary if iodine supplements were to be provided.

Consistency

The guidelines were consistent in indicating that iodine supplementation is generally not required for infants and young children.

Evidence Base

Across the two guideline documents, the committee identified two statements of recommendation. The recommendation from the New Zealand Ministry of Health (2012) guideline document mapped to a narrative review. The recommendation from the WHO guideline document (WHO Secretariat et al., 2007) could not be mapped to its evidence.

Iodine Consumption from Foods

The New Zealand Ministry of Health (2012) guideline document recommended using iodized salt, if salt is used in the food provided to toddlers, and to "gradually introduce foods containing iodine." The guideline document also included a list of specific foods containing iodine, and suggested that these foods be prioritized for exclusively breastfed infants.

Consistency

Only one guideline document included recommendations related to iodine intake from foods. As such, no comment on consistency could be made.

Evidence Base

The four statements of recommendation from the New Zealand Ministry of Health (2012) mapped to narrative reviews.

OTHER NUTRIENT SUPPLEMENTS

Seven guideline documents included recommendations related to other nutrient supplements, beyond iron, vitamin D, and iodine (recommendations related to supplementation of these nutrients are described in the preceding sections) (see Appendix B, Table B-17). One of the guideline documents was a collaborative effort among two organizations (PAHO/WHO, 2003). WHO participated in two of the guideline documents (PAHO/WHO, 2003; WHO, 2005). The guideline documents reflect seven organizations from Australia, New Zealand, and the United States, along with PAHO and WHO.[57]

Nutrient Supplements, Generally

Five guideline documents included general recommendations related to nutrient supplements. The recommendations generally stated that nutrient supplements are not needed if the infant or child is consuming a healthy, nutritious diet. Guideline documents noted nutrients that did not require supplementation, including zinc (even for breastfed infants) (Taylor and ABM, 2018) and selenium (Ministry of Health, 2012). Both an RWJF-HER guideline document (Pérez-Escamilla et al., 2017) and the New Zealand Ministry of Health (2012) noted that supplements and multivitamins are not necessary if a healthy diet is being consumed.

When nutrient supplements were recommended, the dose required was not always stated. In the WHO (2005) and PAHO/WHO (2003) guideline documents, use of fortified foods or supplements was recommended "as needed." Such scenarios included recommending fortified foods or supplements containing several micronutrients (including iron, zinc, calcium, and vitamin B12) when the diet did not contain adequate amounts of animal-source foods.

[57] Organizations reflected in the guideline documents include ABM, New Zealand Ministry of Health, NHMRC, PAHO, RWJF-HER, USPSTF, and WHO.

Consistency

The guideline documents were generally consistent in indicating that infants and toddlers with healthy, varied diets typically do not need nutrient supplements. The guideline documents varied with respect to which nutrients were specifically discussed and whether conditions under which nutrient supplementation would be warranted were explicitly specified.

Evidence Base

Across the five guideline documents, the committee identified seven statements of recommendation. Most recommendations mapped to narrative reviews, technical documents, or background documents. For the one recommendation from ABM (Taylor and ABM, 2018), the type of literature review supporting the guidance was unclear.

Fluoride Supplementation

Two guideline documents made recommendations related to fluoride supplementation. The U.S. Preventive Services Task Force (USPSTF) recommended "that primary care clinicians prescribe oral fluoride supplementation starting at age 6 months for children whose water supply is deficient in fluoride" (Moyer, 2014). The Australian government did not recommend fluoride supplementation for infants and stated that, in nonfluoridated water areas, a dentist should be consulted regarding fluoride supplementation (NHMRC, 2012).

Consistency

The guideline documents were consistent in recommending that fluoride supplementation for infants and young children be contingent on the fluoride status of the water supply. There were some inconsistencies in the language describing the extent to which supplementation should be provided in areas with fluoride-deficient water supplies. The USPSTF guideline document (Moyer, 2014) indicated that health care providers should prescribe fluoride supplements in such areas, whereas the Australian government guideline document (NHMRC, 2012) indicated supplementation should be based on a dental consultation.

Evidence Base

Across the two guideline documents, the committee identified two statements of recommendation. The USPSTF recommendation was based on a systematic review; the recommendation was graded B, meaning "There

is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial" (Moyer, 2014). The Australian government recommendation mapped to a Centers for Disease Control and Prevention recommendation (CDC, 2001).

DIETARY FAT

Seven guideline documents included recommendations related to dietary fat (see Appendix B, Table B-18). One of the guideline documents was a collaborative effort among four organizations (Health Canada et al., 2014), one of which also provided a separate guideline document (Amit et al., 2010 [CPS]). Another guideline document was a collaborative effort among two organizations (PAHO/WHO, 2003), one of which also provided a separate guideline document (WHO, 2005). The identified guideline documents reflect nine different organizations from Australia, Canada, New Zealand, and the United States, along with PAHO and WHO.[58]

Dietary Fat Intake, Generally

Three guideline documents included recommendations broadly focused on fat intake. A collaborative guideline document from Canada highlighted the importance of intake of nutritious higher-fat foods (Health Canada et al., 2014). A WHO guideline document recommended amounts of fats to be added to the diet of nonbreastfed infants based on whether or not animal-source foods were eaten (WHO, 2005). A guideline document from PAHO/WHO (2003) recommended that the diets of breastfed children contain "adequate fat content."[59]

Consistency

The guideline documents were consistent in noting the importance of young children having diets with adequate fat content.

Evidence Base

Across the three guideline documents, the committee identified three statements of recommendation. All recommendations mapped to narrative reviews, background documents, or technical documents.

[58] Organizations reflected in the guideline documents include Breastfeeding Committee for Canada, CPS, Dietitians of Canada, Health Canada, New Zealand Ministry of Health, NHMRC, PAHO, RWJF-HER, and WHO.

[59] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

Type of Fat

Four guideline documents included recommendations on types of fat. Two guideline documents recommended avoiding foods with high levels of saturated fat and/or trans fat (NHMRC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]). Other guideline documents encouraged intake of essential fatty acids for strict vegans (Amit et al., 2010 [CPS]) or consumption of polyunsaturated fatty acids from plant oils in spreads and margarines (Ministry of Health, 2012). The guideline document from RWJF-HER recommended offering deboned fish to toddlers because it is a good source of healthy fat (omega-3s) and recommended choosing healthy oils such as "olive, canola, corn, or sunflower oil" when preparing foods for toddlers (Pérez-Escamilla et al., 2017).

Consistency

Two guideline documents, one from the Australian government (NHMRC, 2012) and one from RWJF-HER (Pérez-Escamilla et al., 2017), were consistent in recommending against foods high in saturated or trans fats. Guideline documents from RWJF-HER (Pérez-Escamilla et al., 2017) and the New Zealand Ministry of Health (2012) were consistent in recommending plant oils.

Evidence Base

Across the four guideline documents, the committee identified seven statements of recommendation. Most of the recommendations mapped to narrative reviews. The saturated fat recommendation from the Australian government (NHMRC, 2012) was embedded in a broader recommendation; the portion specifically related to saturated fat could not be mapped to its evidence.

SUMMARY

Guideline documents from government agencies and authoritative organizations provide a wide range of recommendations related to what to feed infants and young children. Guideline documents that commented on similar topics were mostly consistent in concept, although nuanced details often varied. The vast majority of recommendations were mapped to narrative reviews. A summary of the committee's findings regarding consistency of recommendations is provided in Table 4-3.

TABLE 4-3 Summary of the Consistency of Recommendations on What to Feed Infants and Young Children, by Topic Area

Topic Area	Summary of Consistency Across Recommendations
Exclusive breastfeeding	• Generally consistent in terms of recommending exclusive breastfeeding for up to, about, or around 6 months of age
Continuation of breastfeeding	• Generally consistent in being in support of continuing breastfeeding for at least 12 months • Not consistent in terms of the specific age to which breastfeeding should be continued
Supplementary formula feedings	• Consistent in indicating that breastfed infants should not be routinely given supplementary formula feedings
Duration of formula use	• Generally consistent in recommending that, for formula-fed infants, commercial infant formula should be used until 12 months of age • Consistent in indicating that infant formula is not needed beyond 12 months of age
Type of infant formula	• Consistent in recommending cow milk–based infant formulas for formula-fed infants • Consistent in recommending that the use of soy-based formula be limited to special circumstances
Toddler milks and follow-on formulas	• Consistent in recommending against the general use of toddler milks
Milk and milk-based products	• Generally consistent in recommending against cow milk before 9 months of age • Not consistent regarding suitability of cow milk for infants 9–12 months of age • Not consistent in whether milk can be added to complementary foods before 12 months of age • Generally consistent in indicating that whole milk should be provided to children in the age range of 12–24 months • Consistent in indicating that the amount of cow milk should be limited for children 12–24 months of age • Some inconsistencies in the recommended limit for the amount of cow milk for children 12–24 months of age • Consistent in recommending against providing flavored milk to infants and young children
Fluids: Water, juice, sugar-sweetened beverages, and other nonmilk beverages	• Consistent in discouraging the provision of water to breastfed infants 0–6 months of age • Consistent in recommending provision of water to infants 6–12 months of age and children older than 1 year • Generally consistent in stating that juice should not be provided in the first 12 months of life

continued

TABLE 4-3 Continued

Topic Area	Summary of Consistency Across Recommendations
Fluids: Water, juice, sugar-sweetened beverages, and other nonmilk beverages (continued)	• Generally consistent in recommending that juice intake for toddlers not exceed 4 ounces per day • Consistent in recommending against providing infants and young children with sugar-sweetened beverages • Consistent in recommending against providing coffee, tea, and caffeinated beverages to infants and young children • Generally consistent in recommending against providing plant-based beverages to infants or young children[a]
Substances to avoid or limit[b]	• Consistent in recommending that foods for infants and young children should be prepared without added sugars • Consistent in recommending that if pre-prepared foods and snacks are offered to young children, they should contain no or limited added or total sugars • Consistent in recommending that if foods with sugars are consumed, they should be consumed at mealtimes instead of as snacks • Consistent in advising against dipping pacifiers or bottle teats in substances with sugars • Consistent in recommending that foods for infants and young children be prepared without adding salt • Consistent in recommending that if pre-prepared foods and snacks are offered to young children, they should contain no or limited salt
Variety and healthy, nutritious foods	• Consistent in recommending that a variety of foods and food groups, textures, and flavors can help meet nutritional requirements
Fruits and vegetables	• Consistent in recommending consumption of a variety of fruits and vegetables
Vegetarian and vegan diet	• Consistent in stipulating the need for a carefully planned diet to meet requirements for several key nutrients • Some inconsistencies in explicitly mentioning a need for fortified products or nutrient supplements for vegans • Generally consistent in mentioning plant-based beverages as an option for toddlers in the context of specific dietary preferences
Foods associated with food allergy and celiac disease	• Consistent in recommending that introduction of potentially allergenic foods should not be delayed • Not consistent in recommending when and how to introduce peanuts based on the infant's risk for peanut allergy • Generally consistent in recommending not delaying introduction of allergenic food beyond 6 months of age, including eggs
Iron	• Consistent in acknowledging the importance of iron-rich complementary foods • Not consistent in recommended age of introduction of iron-rich complementary foods • Consistent in recommending that formula-fed infants be given iron-fortified infant formulas until at least 6 months of age

TABLE 4-3 Continued

Topic Area	Summary of Consistency Across Recommendations
Iron (continued)	• Some inconsistencies in duration of use of iron-fortified formulas for formula-fed infants, and suggested iron content of infant formulas • Generally consistent in advising against general use of iron supplements[c] • Consistent in recommending the need for adequate intake of iron among infants fed vegetarian or vegan diets
Vitamin D	• Generally consistent in recommending vitamin D supplementation among breastfed infants • Consistent in relating the need for vitamin D supplementation for formula-fed infants to the total amount of daily infant formula intake • Not consistent regarding the amount of infant formula intake that necessitates vitamin D supplementation • Consistent in recommending vitamin D supplementation for high-risk or vitamin D deficient children 12–24 months of age
Iodine	• Consistent in recommending against the use of iodine supplements
Other nutrient supplements	• Generally consistent in stating that nutrient supplements are not needed for infants and young children consuming a healthy, varied diet[d] • Consistent in recommending that fluoride supplementation for infants and young children be contingent on the fluoride status of the water supply
Dietary fat	• Consistent in noting the importance of diets with adequate fat content • Consistent in recommending against foods high in saturated and/or trans fats • Consistent in recommending plant oils

NOTE: The committee uses the following phrases to describe consistency of recommendations:
- *Consistent* indicates alignment across the recommendations.
- *Generally consistent* indicates that the recommendations tended to provide similar guidance, although there were some differences in details or wording.
- *Some inconsistencies* indicates mixed recommendations, some of which align.
- *Not consistent* indicates recommendations provided different guidance on a topic.

[a] This statement pertains to general use of plant-based beverages. A caveat is noted in the "Vegetarian and vegan diet" section.

[b] Recommendations regarding foods to avoid or limit based on food safety considerations (e.g., unpasteurized beverages, honey due to the risk of botulism) are summarized in Chapter 5, "Safety of Foods and Feeding Practices," and Table 5-2.

[c] A recommendation in a 2010 guideline document predated the acceptance of delayed cord clamping in the United States, which changed iron supplementation recommendations for infants. The statement of consistency reflects only the more recent guideline documents.

[d] This statement pertains to nutrient supplements generally. Consistency of recommendations related to supplementing specific nutrients are noted elsewhere in the table.

5

Existing Recommendations on How to Feed

Chapter Highlights

- Of the 43 eligible guideline documents, 23 included one or more recommendations related to how to feed infants and young children.
- Existing recommendations on *how to feed* infants and young children were consistent or generally consistent for most topic areas.
- Slight differences were identified in some topic areas, particularly related to the age or age range specified in the recommendation, such as whether the recommended age of introduction of complementary foods is focused on (approximately) 6 months or is an age range (4–6 months).
- Most recommendations mapped to narrative reviews.
- A summary of consistency across recommendations on *how to feed* infants and young children is presented in a table at the end of this chapter.

This chapter reviews the recommendations related to *how to feed* infants and young children that were included in the guideline documents that met the committee's inclusion criteria (see Chapter 2). Numerous topics related to how to feed infants and young children did not appear in the eligible guideline documents. Thus, although this chapter is a comprehen-

sive summary of the identified recommendations, it is not an exhaustive summary of all topics that are of interest to various stakeholders. Approximately one-third of the abstracted recommendations provided guidance related to how to feed infants and young children from birth to 24 months. Eligible recommendations were found in 23 of the 43 guideline documents. The recommendations have been grouped into eight topic areas; within those topic areas, recommendations are discussed thematically. Throughout this chapter, the following terminology is used:

- *Organization* refers to the agency, organization, or group that directly participated in the guideline development. Throughout, there is reference to *different organizations*, which refers to the number of unique entities that participated in one or multiple guideline documents.
- *Guideline document* refers to the overall resource (e.g., journal article, report, webpage) from the organization that contains the recommendation(s).
- *Recommendation* refers to a statement on one or multiple topic areas that the committee abstracted from the guideline documents. Each abstracted recommendation is provided in Appendix B.
- *Consistency* refers to the committee's comparison of existing recommendations on a given theme. Box 5-1 presents the terminology the committee uses throughout this chapter to describe the levels of consistency.

BOTTLE USE AND PROPPING

Ten guideline documents included recommendations related to bottle use or propping (see Appendix B, Table B-19). Four of the guideline documents were collaborative efforts between two or more organizations (AAPD, 2016; Health Canada et al., 2014, 2015; New Zealand Dental

BOX 5-1
Committee's Terminology Related to Consistency of Recommendations

- *Consistent* indicates alignment across the recommendations.
- *Generally consistent* indicates that the recommendations tended to provide similar guidance, although there were some differences in details or wording.
- *Some inconsistencies* indicates mixed recommendations, some of which align.
- *Not consistent* indicates recommendations provided different guidance on a topic.

Association, 2008); the American Academy of Pediatrics (AAP) and the New Zealand Ministry of Health each participated in two different guideline documents. Accordingly, the identified guideline documents reflect 12 different organizations from Australia, Canada, Europe, New Zealand, the United Kingdom, and the United States.[1]

Foods and Fluids to Provide or Avoid in Bottle Use

Six guideline documents included recommendations on foods and fluids to provide or avoid in bottle use. Two guideline documents indicated that a bottle should be used for breast milk or infant formula (New Zealand Dental Association, 2008; NICE, 2008); the National Institute for Health and Care Excellence (NICE) guideline document also specified that a bottle could be used for water. A guideline document from the New Zealand Ministry of Health stated, "Avoid … long-term use of bottles containing liquids other than water" (Ministry of Health, 2012).[2] Guideline documents from AAP (Heyman et al., 2017) and the American Academy of Pediatric Dentistry (AAPD) (2016) stated that juice or sugar-sweetened beverages should not be provided in a bottle. A NICE (2008) guideline document discouraged the addition of sugar and solid foods to bottles.[3] A guideline document from the Robert Wood Johnson Foundation-Healthy Eating Research (RWJF-HER) recommended against the mixing of cereal with formula or breast milk in a bottle (Pérez-Escamilla et al., 2017).

Consistency

The guideline documents were generally consistent in recommending that certain foods and fluids should be avoided in bottle use, including sugar-sweetened beverages and juice (AAPD, 2016; Heyman et al., 2017 [AAP]), sugar and solid foods (NICE, 2008), and cereal mixed with formula or breast milk (Pérez-Escamilla et al., 2017 [RWJF-HER]). One guideline document advised against prolonged use of bottles with fluids besides water (Ministry of Health, 2012).

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[1] Organizations reflected in the guideline documents include AAP, AAPD, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, ESPGHAN, Health Canada, New Zealand Dental Association, New Zealand Ministry of Health, NHMRC, NICE, and RWJF-HER.

[2] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[3] Terminology related to *sugar* and *sugars* varies in the field. Whereas some may use the singular to refer specifically to the disaccharide sucrose, it is often used to describe sweeteners broadly. As much as possible, the committee uses verbatim language related to sugars from each recommendation.

Evidence Base

Across the six guideline documents, the committee identified seven statements of recommendation. Three of the recommendations—from AAP (Heyman et al., 2017), AAPD (2016), and RWJF-HER (Pérez-Escamilla et al., 2017)—mapped to narrative reviews. Two recommendations from the NICE (2008) guideline document mapped to a UK Department of Health report (Department of Health, 1994) and a rapid review.[4] The New Zealand Ministry of Health (2012) recommendation mapped to a New Zealand Dental Association guideline document (New Zealand Dental Association, 2008). One recommendation from the New Zealand Dental Association (2008) could not be mapped to its evidence.

Age Restriction for Bottle Use

Four guideline documents included recommendations on age restrictions for bottle use. A European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) guideline document indicated "by 12 months infants should mainly drink from a cup rather than a bottle" (Fewtrell et al., 2017). Similarly, an RWJF-HER guideline document and a NICE guideline document both discouraged bottle use after 12 months of age (NICE, 2008; Pérez-Escamilla et al., 2017). An AAPD (2016) guideline document recommended avoiding baby bottle use after 12–18 months.

Consistency

The guideline documents were generally consistent in recommending that bottle use should be discontinued at 12 months, with one guideline document recommending bottle use be discontinued during the 12–18-month age range (AAPD, 2016).

Evidence Base

Across the four guideline documents, the committee identified four statements of recommendation. The ESPGHAN recommendation from Fewtrell et al. (2017) mapped to a systematic literature search, the AAPD (2016) and RWJF-HER (Pérez-Escamilla et al., 2017) recommendations mapped to narrative reviews, and the NICE (2008) recommendation mapped to a UK Department of Health report (Department of Health, 1994) and a rapid review.

[4] A rapid review is a literature review process that has simplified or omitted some of the components of the systematic review process. A rapid review has been described as a "streamlined approach to synthesizing evidence—typically for informing emergent decisions faced by decision makers in health care settings" (Khangura et al., 2012).

Going to Bed or Sleeping Without a Bottle

Five guideline documents included recommendations related to going to bed or sleeping without a bottle. Four of the recommendations specifically stated that an infant or toddler should not be put to sleep or go to bed with a bottle (Ministry of Health, 2012; New Zealand Dental Association, 2008; NHMRC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]). Two of the guideline documents recommended avoiding giving bottles at night (Health Canada et al., 2014; Ministry of Health, 2012), with the collaborative guideline document from Canada indicating that the recommendation specifically applied to "an older infant or young child who is not breastfed or receiving breastmilk."[5]

Consistency

The guideline documents were generally consistent in recommending putting a child to bed and sleeping without a bottle. Two guideline documents had related statements regarding avoidance of nighttime bottle feeding, although not specifically linked to putting a child to bed or sleeping with a bottle.

Evidence Base

Across the five guideline documents, the committee identified eight statements of recommendation. Recommendations from RWJF-HER (Pérez-Escamilla et al., 2017) and a collaborative Canadian guideline document (Health Canada et al., 2014) mapped to narrative reviews. Recommendations in the New Zealand Dental Association (2008) guideline document and the Australian government guideline document (NHMRC, 2012) could not be mapped to their evidence. The New Zealand Ministry of Health (2012) guideline document, in turn, cited the New Zealand Dental Association's 2008 guideline document as evidence for its recommendation.

Type of Bottle and Bottle-Feeding Behaviors

Four guideline documents included recommendations related to bottle-feeding behaviors. An RWJF-HER guideline document discouraged behaviors such as using a bottle or food as a reward and forcing or encouraging the baby to finish the bottle (Pérez-Escamilla et al., 2017); the guideline document also specifically noted that the size of the bottle could contribute

[5] © All rights reserved. *Nutrition for healthy term infants: Recommendations from six to 24 months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

to consuming more than needed (Pérez-Escamilla et al., 2017). A guideline document from the Australian government advised bottle feeding according to the infant's needs (NHMRC, 2012). The New Zealand Dental Association (2008) advised holding the baby while bottle feeding. Finally, the New Zealand Ministry of Health recommended a fully ventilated bottle when bottle feeding, and cautioned against leaving the infant unattended and feeding from a bottle (Ministry of Health, 2012).

Consistency

Recommendations that addressed the type of bottle and bottle-feeding behaviors were diverse, with little overlap in the type of guidance provided. As such, no comment can be made on the consistency of the recommendations.

Evidence Base

Across the four guideline documents, the committee identified eight statements of recommendation. Recommendations from RWJF-HER (Pérez-Escamilla et al., 2017) and the New Zealand Ministry of Health (2012) mapped to narrative reviews. Recommendations from the Australian government (NHMRC, 2012) and the New Zealand Dental Association (2008) could not be mapped to their evidence.

Bottle Propping

Three guideline documents included recommendations on bottle propping (Health Canada et al., 2015; NHMRC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]). All advised against bottle propping.

Consistency

The guideline documents were consistent in advising against bottle propping.

Evidence Base

Across the three guideline documents, the committee identified four statements of recommendation. Recommendations from RWJF-HER (Pérez-Escamilla et al., 2017) and a collaborative Canadian guideline document (Health Canada et al., 2015) mapped to narrative reviews. Two statements of recommendation from the Australian government (NHMRC, 2012) could not be mapped to their evidence.

CUP USE

Eleven guideline documents included recommendations related to cup use (see Appendix B, Table B-20). Four of the guideline documents were collaborative efforts across multiple organizations (AAPD, 2016; Health Canada et al., 2014; Lott et al., 2019 [RWJF-HER]; New Zealand Dental Association, 2008); four of the organizations that participated in collaborative guideline documents also had independent guideline documents that included recommendations related to cup use. Accordingly, the identified guideline documents reflect 14 different organizations from Australia, Canada, Europe, New Zealand, the United Kingdom, and the United States.[6]

Age for Cup Use

Six guideline documents included recommendations on the age for cup use. All indicated that the appropriate age range for introducing cup use was between 6 and 12 months. Three of the guideline documents specifically stated the age range as "6–12 months" (Lott et al., 2019; NICE, 2008; Pérez-Escamilla et al., 2017 [RWJF-HER]). An ESPGHAN guideline document indicated the appropriate age was "by 12 months" (Fewtrell et al., 2017). Two guideline documents—one from the American Heart Association (AHA) (Gidding et al., 2005) and one from the Australian government (NHMRC, 2012)—said cups can be introduced at "at least" or "around" 6 months.

Consistency

The guideline documents were generally consistent in recommending that the age for transitioning infants to cup use should be 6–12 months, although two guideline documents used the phrase "around 6 months" (Gidding et al., 2005 [AHA]; NHMRC, 2012). One possible reason for the variation could be that the AHA recommendation refers to delaying the introduction of 100% juice until at least 6 months of age, and if given it should be given in a cup (Gidding et al., 2005), whereas the statement by the Australian government addressed the need to teach sipping skills (NHMRC, 2012).

[6] Organizations reflected in the guideline documents include AAP, AAPD, AHA, AND, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, ESPGHAN, Health Canada, New Zealand Dental Association, New Zealand Ministry of Health, NHMRC, NICE, and RWJF-HER.

Evidence Base

Across the six guideline documents, the committee identified six statements of recommendation. The recommendation from the ESPGHAN guideline document (Fewtrell et al., 2017) mapped to a systematic literature search. Recommendations from the two RWJF-HER guideline documents (Lott et al., 2019; Pérez-Escamilla et al., 2017) and the Australian government guideline document (NHMRC, 2012) mapped to narrative reviews. The NICE (2008) guideline document mapped to a UK Department of Health report (Department of Health, 1994) and a rapid review. The recommendation from the AHA guideline document (Gidding et al., 2005) could not be mapped to its evidence.

Fluids to Provide or Avoid in Cup Use

Eight guideline documents included recommendations that addressed the fluids to provide or avoid when feeding from a cup. Two guideline documents from RWJF-HER advised providing drinking water (4–8 ounces) from a cup (in one case, fluoridated water) to infants 6–12 months or once solid foods are introduced (Lott et al., 2019; Pérez-Escamilla et al., 2017). One of the RWJF-HER guideline documents (Pérez-Escamilla et al., 2017) also specified that toddlers should be offered water in a cup. Four guideline documents mentioned using a cup for cow milk (Pérez-Escamilla et al., 2017 [RWJF-HER]), milk and other drinks (NHMRC, 2012), or expressed breast milk and formula (Ministry of Health, 2012; New Zealand Dental Association, 2008). Four guideline documents addressed limiting or avoiding juice (and sugar-sweetened beverages) fed by cup (AAPD, 2016; Gidding et al., 2005 [AHA]; Heyman et al., 2017; Pérez-Escamilla et al., 2017 [RWJF-HER]).

Consistency

The guideline documents were generally consistent in recommending that milk (cow milk, breast milk) should be served to toddlers in a cup (Ministry of Health, 2012; New Zealand Dental Association, 2008; NHMRC, 2012; Pérez-Escamilla et al., 2017). Although some guidelines referenced water being provided in a cup and the avoidance or limitation of serving juice in a cup, these were not stated across all documents.

Evidence Base

Across the eight guideline documents, the committee identified 12 statements of recommendation. Most of the recommendations mapped to

narrative reviews. Two recommendations from the New Zealand Dental Association (2008) and one from the AHA guideline document (Gidding et al., 2005) could not be mapped to their evidence.

General Considerations for Cup Use

Two guideline documents included recommendations related to general cup use. A collaborative guideline document from Canada encouraged the use of an open cup, with assistance (Health Canada et al., 2014). A recommendation from an RWJF-HER guideline document advised not putting a toddler to sleep with a sippy cup (Pérez-Escamilla et al., 2017).

Consistency

Recommendations that addressed general considerations related to cup use were diverse, with little overlap in the type of guidance provided. As such, no comment can be made on the consistency of the recommendations.

Evidence Base

Across the two guidelines, the committee identified two statements of recommendation. Both recommendations mapped to narrative reviews.

SAFETY OF FOODS AND FEEDING PRACTICES

Fourteen guideline documents included recommendations related to food safety and safe feeding practices (see Appendix B, Table B-21). Six guideline documents represented a collaboration between multiple organizations (Health Canada et al., 2014, 2015; Lott et al., 2019; New Zealand Dental Association, 2008; PAHO/WHO, 2005; SACN and COT, 2018). Five of the collaborating organizations also had a separate guideline document that included related recommendations. The identified guideline documents therefore reflect 17 different organizations from Australia, Canada, New Zealand, the United Kingdom, and the United States, along with the Pan American Health Organization (PAHO) and the World Health Organization (WHO).[7]

[7] Organizations reflected in the guideline documents include AAP, AAPD, AHA, AND, Breastfeeding Committee for Canada, COT, CPS, Dietitians of Canada, Health Canada, New Zealand Dental Association, New Zealand Ministry of Health, NHMRC, NICE, PAHO, RWJF-HER, SACN, and WHO.

Pasteurized Juice, Milk, and Dairy Products

Five guideline documents included recommendations related to the pasteurization of juice, milk, and dairy products. Guideline documents from the Australian government (NHMRC, 2012) and an RWJF-HER consensus statement (Lott et al., 2019) specified that milk provided to children should be pasteurized. Several guideline documents recommended against providing children unpasteurized juice (Health Canada et al., 2014; Heyman et al., 2017 [AAP]; Pérez-Escamilla et al., 2017 [RWJF-HER]), milk (Health Canada et al., 2014; NHMRC, 2012; Pérez-Escamilla et al., 2017), or dairy products (Health Canada et al., 2014; Pérez-Escamilla et al., 2017). These guideline documents indicated that such products should not be offered or used (NHMRC, 2012; Pérez-Escamilla et al., 2017), should be "strongly discouraged" (Heyman et al., 2017 [AAP]), and should be avoided (Health Canada et al., 2014).

Consistency

The guideline documents were consistent in recommending that pasteurized milk be provided and that giving children unpasteurized juice, milk, or milk products should be avoided.

Evidence Base

Across the five guideline documents, the committee identified seven statements of recommendation. Recommendations from AAP (Heyman et al., 2017) and a collaborative guideline document from Canada (Health Canada et al., 2014) mapped to narrative reviews. A guideline document from the Australian government (NHMRC, 2012) included two recommendations, one of which mapped to both a systematic review and a narrative review, with the other mapping to a systematic review, a narrative review, and a WHO report (Michaelsen et al., 2003). Recommendations from an RWJF-HER consensus statement (Lott et al., 2019) mapped to resources from the government (*Dietary Guidelines for Americans*, Child and Adult Care Food Program federal standards), AAP, and other RWJF-HER expert panels. Finally, the recommendation from the other RWJF-HER guideline document mapped to FoodSafety.gov.

Safety of Honey Consumption[8]

Three guideline documents included recommendations related to the safety of honey consumption. All recommended that honey not be given to

[8] Recommendations related to avoiding or limiting honey as a sugary substance that are not related to the risk of botulism (e.g., general recommendations, recommendations related to dental caries) are presented in Chapter 4, "Substances to Avoid or Limit."

infants under 12 months of age because of the risk of botulism (Health Canada et al., 2014; NHMRC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]).

Consistency

The guideline documents were consistent in recommending that giving honey to infants under 1 year of age should be avoided owing to risk of botulism.

Evidence Base

Across the three guideline documents, the committee identified three statements of recommendation. The recommendation from the Australian government guideline document (NHMRC, 2012) mapped to a single journal article (Brook, 2007). The other recommendations mapped to narrative reviews.

Consumption of Raw or Undercooked Foods

Five guideline documents included recommendations related to infant and young child consumption of raw or undercooked foods. One guideline document recommended avoiding raw or undercooked meat, poultry, and fish (Health Canada et al., 2014). Another guideline document included undercooked meats, poultry, or seafood as foods to avoid (Pérez-Escamilla et al., 2017 [RWJF-HER]). All of the guideline documents included recommendations related to preparation of eggs and consumption of raw or undercooked eggs. The Australian government guideline documents recommended cooking all eggs thoroughly, "until the white is completely set and the yolk begins to thicken" (NHMRC, 2012).[9] Similarly, a guideline document from RWJF-HER recommended that undercooked eggs (e.g., "runny eggs") should not be offered (Pérez-Escamilla et al., 2017 [RWJF-HER]). A collaborative guideline document from Canada recommended avoiding raw or undercooked products containing raw eggs (Health Canada et al., 2014). Two guideline documents from advisory committees to the UK government, which were published in the same year, had slightly different recommendations (SACN, 2018; SACN and COT, 2018). Both guideline documents indicated that duck, goose, and quail eggs should always be cooked thoroughly (SACN, 2018; SACN and COT, 2018), with one document also including hen eggs from outside the United Kingdom (SACN, 2018). One, however, specified that infants and children "can safely eat raw or lightly cooked eggs that are produced under the British Lion Code of Practice" (SACN, 2018). The other mentioned that the recommendation related

[9] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

to consuming raw and undercooked hen eggs was under review because of another United Kingdom government committee's recent conclusions regarding microbiological risk from shell eggs (SACN and COT, 2018).

Consistency

The guideline documents were generally consistent in recommending that infants and young children avoid consumption of raw or undercooked eggs. The one exception from the Scientific Advisory Committee on Nutrition (SACN) (2018) mentioned was hen eggs produced under the British Lion Code of Practice, as eggs produced under this code are considered to pose very low microbiological risk (ACMSF, 2016). This exception appeared to be differentially identified between two guideline documents from the advisory committees to the UK government in the same year because the assessment of risk from microbial contamination was evolving. A guideline document from RWJF-HER (Pérez-Escamilla et al., 2017) and a collaborative guideline document from Canada (Health Canada et al., 2014) were consistent in recommending that infants and young children avoid eating raw or undercooked meat, poultry, fish, and seafood.

Evidence Base

Across the five guideline documents, the committee identified five statements of recommendation. The recommendation from the SACN and the Committee on Toxicity of Chemicals in Food, Consumer Products, and the Environment (COT) (2018) guideline document was embedded in a broader recommendation that mapped to a systematic review; the portion specifically related to raw eggs, however, was noted as being under review as a result of a recent publication (ACMSF, 2016). Recommendations from the collaborative Canadian guideline document (Health Canada et al., 2014), RWJF-HER (Pérez-Escamilla et al., 2017), and the SACN (2018) guideline document each mapped to narrative reviews. The recommendation from the Australian government (NHMRC, 2012) could not be mapped to its evidence.

Prevention of Choking

Eleven guideline documents included recommendations related to the prevention of choking. Several recommendations advise not offering food items that are a choking hazard to infants and young children. Some of the guideline documents specified general characteristics related to shape, size, texture, and consistency, such as hard, small, round, or sticky foods (Abrams et al., 2019 [CPS]; Health Canada et al., 2014; Ministry of Health, 2012; New Zealand Dental Association, 2008; NHMRC, 2012). Some guideline documents provided specific examples of foods that are potential choking hazards (see Table 5-1).

TABLE 5-1 Examples of Specific Foods Identified as Potential Choking Hazards for Young Children in Abstracted Feeding Recommendations

Organization	Citation	Hard Candy	Hot Dogs	Grapes	Large Seeds	Nuts	Popcorn	Raw Carrots	Boned Fish
Australian government	NHMRC, 2012					X			
New Zealand Dental Association	New Zealand Dental Association, 2008					X			
New Zealand Ministry of Health	Ministry of Health, 2012[a]	X	X	X	X	X	X	X	
PAHO/WHO	PAHO/WHO, 2003			X		X		X	
RWJF-HER	Pérez-Escamilla et al., 2017	X	X	X		X	X		X
SACN	SACN, 2018					X			
SACN and COT	SACN and COT, 2018					X			
WHO	WHO, 2005			X		X		X	

NOTE: COT = Committee on Toxicity of Chemicals in Food, Consumer Products, and the Environment; NHMRC = National Health and Medical Research Council; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition; WHO = World Health Organization.

[a] The recommendations from this guideline document refers the reader to a more comprehensive list of potential choking hazards. Foods included in the comprehensive list, but not in the abstracted recommendations, are noted in the table. Potential choking hazards not reflected in the table, but identified by the Ministry of Health (2012) guideline document include

- Foods that are difficult to bite or chew (e.g., raw apple, raw celery, hard dried fruit, corn chips, rice crackers),
- Small round foods (e.g., berries, cherry tomatoes, raisins/sultanas, peas, watermelon seeds), foods with skins or leaves (e.g., sausage, chicken, lettuce, spinach, cabbage, stone fruits),
- Compressible foods (e.g., sausage, pieces of cooked meat, marshmallow, chewing or bubble gum),
- Thick pastes (e.g., chocolate spreads, thick peanut butter), and
- Fibrous or stringy foods (e.g., raw pineapple, rhubarb).

Four guideline documents recommended not offering foods that are a choking hazard until after 5 years of age, mentioning whole nuts as a specific example (Ministry of Health, 2012; New Zealand Dental Association, 2008; SACN, 2018; SACN and COT, 2018). Two guideline documents provided specific guidance related to bottle feeding, citing the practices of adding cereal to formula or breast milk in bottles (Pérez-Escamilla et al., 2017 [RWJF-HER]) and leaving infants alone while feeding and bottle propping (Health Canada et al., 2015) as choking hazards.

Some guideline documents provided specific examples for ways in which food shape, size, texture, and consistency can be altered to reduce choking risk. A guideline document from the New Zealand Dental Association (2008) cited general food preparation techniques, such as grating, cooking, mashing, or puréeing foods. A guideline document from the Canadian Paediatric Society (CPS) provided a specific example, suggesting diluting smooth peanut butter with water or breast milk or offering a peanut puff product (Abrams et al., 2019). A recommendation in the New Zealand Ministry of Health (2012) guideline document referred the reader to additional resources, which advised that altering food texture ("grate, cook, finely chop, or mash the food") and removing potentially problematic portions of the food ("peel off the skin or remove the strong fibers") can reduce choking risk.

Consistency

The guideline documents were consistent in recommendations to prevent choking, with some differences in the examples of choking hazards that were provided and on specifically indicating the age at which foods that are choking hazards can be safely offered. Most recommendations focused on food types and feeding practices to avoid, while a few provided examples of how to modify foods to reduce the risk of choking.

Evidence Base

Across the 11 guideline documents, the committee identified 15 statements of recommendation. Most recommendations mapped to narrative reviews, background documents, or technical documents. A recommendation from the SACN and COT (2018) guideline document was embedded in a broader recommendation that mapped to a systematic review; the portion specifically related to choking hazards, however, could not be mapped to its evidence. The Australian government guideline document (NHMRC, 2012) contained two recommendations; one recommendation mapped to recommendations from the UK Food Standards, while the other recommendation could not be mapped to its evidence. The recommendation from the

New Zealand Dental Association (2008) guideline document could not be mapped to its evidence.

Supervision During Eating

Eight guideline documents included recommendations related to supervision of infants and young children while they are eating. Some guideline documents recommended that infants and young children never be left unattended while they are eating (NICE, 2008; SACN, 2018; SACN and COT, 2018), in some cases specifically mentioning that infants should not be left alone feeding from a bottle, and particularly from a propped bottle (Health Canada et al., 2015; Ministry of Health, 2012; NHMRC, 2012). Other guideline documents specified that infants and young children should be supervised while they are eating (Health Canada et al., 2014; NHMRC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]).

Consistency

The guideline documents were consistent in recommending that infants and young children be supervised or that they never be left alone while they are eating.

Evidence Base

Across the eight guideline documents, the committee identified nine statements of recommendation. Most recommendations mapped to narrative reviews. One recommendation from the SACN and COT (2018) guideline document was embedded in a broader recommendation that mapped to a systematic review; the portion specifically related to supervision, however, could not be mapped to its evidence. The recommendation from NICE (2008) mapped to a UK Department of Health report (Department of Health, 1994) and a rapid review. Two recommendations from the Australian government guideline document (NHMRC, 2012) could not be mapped to their evidence.

INTRODUCTION OF COMPLEMENTARY FOODS

Seventeen guideline documents included recommendations related to introduction of complementary foods (see Appendix B, Table B-22). Five of the guideline documents were collaborative efforts between two or more organizations (Alvisi et al., 2015; Health Canada et al., 2014, 2015; PAHO/WHO, 2003; SACN and COT, 2018). Four organizations—AAP, CPS, SACN, and WHO—each participated on two or more guideline docu-

ments. Accordingly, the identified guideline documents reflect 17 different organizations from Australia, Canada, Europe, Italy, New Zealand, the United Kingdom, and the United States, along with PAHO and WHO.[10]

Age of Introduction

Twelve guideline documents included recommendations on age of introduction. Six guideline documents stated that complementary foods should be introduced at "about" or "around" 6 months (AAP Section on Breastfeeding, 2012; Abrams et al., 2019 [CPS]; Ministry of Health, 2012; NHMRC, 2012; SACN, 2018; SACN and COT, 2018). Similarly, a guideline document from PAHO/WHO specified 6 months (PAHO/WHO, 2003). Three guideline documents recommended an age range of 4–6 months (Alvisi et al., 2015 [SIAIP and SIGENP]; Fewtrell et al., 2017 [ESPGHAN]; Pérez-Escamilla et al., 2017 [RWJF-HER]). One guideline document implied an age range, but the actual recommendation is unclear, stating, "All infants require solid foods from 6 months for adequate nutrition. Solid food should never be introduced before 4 months" (RCPCH, 2019). A guideline document from the European Food Safety Authority (EFSA) (2019) stated that a specific age cannot be defined; the guideline went on to say, "for nutritional reasons, the majority of infants need complementary foods from around 6 months of age," but it also noted that "the appropriate age range depends on the individual's characteristics and development, even more so if the infant was born preterm."

Consistency

The guideline documents were generally consistent in recommending that complementary foods should not be introduced before 4 months and should be introduced by or around 6 months of age. The guideline documents were inconsistent as to whether the recommended age of introduction is an age range (4–6 months) or is focused on (approximately) 6 months, with the latter being more common.

One possible reason for the inconsistency is whether the recommendation was intended to be applied at the population level or at the individual level. The PAHO/WHO (2003) guiding principles were aimed at the population level (WHO, 2001), recognizing that there may need to be adapta-

[10] Organizations reflected in the guideline documents include AAP, Breastfeeding Committee for Canada, COT, CPS, Dietitians of Canada, EFSA, ESPGHAN, Health Canada, New Zealand Ministry of Health, NHMRC, PAHO, RCPCH, RWJF-HER, SACN, SIAIP, SIGENP, and WHO.

tion at the individual level. Another reason for the inconsistency is that the potential risks of introducing complementary foods before 6 months may differ between high-income and low-income populations, such as exposure to pathogens from complementary foods (PAHO/WHO, 2003). Lastly, several organizations aligned the recommendation for introduction of complementary foods with the recommendation for exclusive breastfeeding for 6 months.

Evidence Base

Across the 12 guideline documents, the committee identified 20 statements of recommendation. Most of the recommendations mapped to narrative reviews and technical background documents. Four statements of recommendation from an EFSA (2019) guideline document and one recommendation each from an Australian government guideline document (NHMRC, 2012) and an ESPGHAN guideline document (Fewtrell et al., 2017) mapped to systematic reviews or systematic literature searches. A recommendation from SACN and COT (2018) mapped to a WHO report (WHO, 2001). Recommendations from a CPS guideline document (Abrams et al., 2019) and an AAP guideline document (AAP Section on Breastfeeding, 2012) could not be mapped to their evidence.

Recommended Foods to Introduce First

Ten guideline documents included recommendations about which foods to introduce first. All mentioned iron-rich foods (such as puréed or mashed meats) or iron-fortified foods (AAP Section on Breastfeeding, 2012; Baker et al., 2010 [AAP]; EFSA Panel on Nutrition et al., 2019; Grueger et al., 2013 [CPS]; Health Canada et al., 2014, 2015; Ministry of Health, 2012; NHMRC, 2012; Pérez-Escamilla et al., 2017; SACN, 2018). Some guideline documents also stated that first foods should be rich in "other micronutrients" (AAP Section on Breastfeeding, 2012) or mentioned zinc specifically (Pérez-Escamilla et al., 2017). A guideline document from RWJF-HER recommended that vegetables be introduced early (mixed with familiar foods) to foster acceptance (Pérez-Escamilla et al., 2017). A guideline document from the New Zealand Ministry of Health stated, "as sources of carbohydrate and dietary fiber, start infant with white or wholemeal bread" (Ministry of Health, 2012).[11]

[11] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

Consistency

The guideline documents were consistent in recommending that the foods introduced first should be iron rich or iron fortified.

Evidence Base

Across the 10 guideline documents, the committee identified 15 statements of recommendation. Most of the recommendations mapped to narrative reviews. Two recommendations from the Australian government guideline document (NHMRC, 2012) and one recommendation from an EFSA guideline document (EFSA Panel on Nutrition et al., 2019) mapped to systematic reviews, either alone or in combination with a narrative review. One recommendation from AAP (Baker et al., 2010) cited the Dietary Reference Intakes for iron. The recommendation from the AAP guideline document (AAP Section on Breastfeeding, 2012) could not be mapped to its evidence.

Gradual Introduction of New Foods and Order of Introduction

Seven guideline documents included recommendations on the gradual introduction of new foods and order of introduction. Five recommended that diversification of the diet and introduction of new foods should occur gradually (Grueger et al., 2013; Ministry of Health, 2012; PAHO/WHO, 2003; SACN, 2018; WHO, 2005). One guideline document recommended that foods be introduced "one at a time to allow the detection of reactions to individual components of foods" (Ministry of Health, 2012).[12] Two guideline documents stated that no particular order is advised for introduction of new foods (after starting with iron-rich foods) (NHMRC, 2012; Pérez-Escamilla et al., 2017 [RWJF-HER]).

Consistency

The guideline documents were consistent in advising gradual introduction of new foods. Two guideline documents were consistent in indicating no restrictions on the order in which complementary foods are introduced; the other three guideline documents did not mention order of introduction.

Evidence Base

Across the seven guideline documents, the committee identified 10 statements of recommendation. Most of the recommendations mapped to

[12] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

narrative reviews or technical background documents. Two recommendations from the Australian government (NHMRC, 2012) mapped to systematic reviews, either alone or in combination with a narrative review.

FOOD CONSISTENCY AND TEXTURE

Ten guideline documents included recommendations on food consistency and texture during infancy and early childhood (see Appendix B, Table B-23). Three of the guideline documents were collaborative efforts between two or more organizations (Alvisi et al., 2015; Health Canada et al., 2014; PAHO/WHO, 2003); both CPS and WHO participated in two of the guideline documents. Accordingly, the identified documents reflect 13 different organizations from Australia, Canada, Europe, Italy, New Zealand, the United Kingdom, and the United States, along with PAHO and WHO.[13]

Appropriate Consistency and Texture

Ten guideline documents included recommendation on the appropriate consistency and texture of foods. All stated or implied that food consistency or texture needs to incrementally change from puréed to more solid consistencies as a function of the developmental stage of the child (Abrams et al., 2019 [CPS]; Alvisi et al., 2015 [SIAIP and SIGENP]; Fewtrell et al., 2017 [ESPGHAN]; Health Canada et al., 2014; Ministry of Health, 2012; NHMRC, 2012; PAHO/WHO, 2003; Pérez-Escamilla et al., 2017 [RWJF-HER]; SACN, 2018; WHO, 2005). One guideline document from ESPGHAN specifically discouraged the prolonged use of puréed foods (Fewtrell et al., 2017). Two guideline documents stated that most infants can eat finger foods by 8 months (PAHO/WHO, 2003; WHO, 2005). A collaborative guideline document from Canada recommended that lumpy textures be offered no later than 9 months (Health Canada et al., 2014). One collaborative guideline document from Italian pediatric societies specifically recommended to wait until the child demonstrates the needed body and oral motor skills to introduce ground, chopped, or finger foods (Alvisi et al., 2015).

Consistency

The guideline documents were consistent in recommending that the food consistency or texture be tailored to the developmental needs of the

[13] Organizations reflected in the guideline documents include Breastfeeding Committee for Canada, CPS, Dietitians of Canada, ESPGHAN, Health Canada, New Zealand Ministry of Health, NHMRC, PAHO, RWJF-HER, SACN, SIAIP, SIGENP, and WHO.

child. The guideline documents were also consistent in recommending that the consistencies or textures should change as a child ages.

Evidence Base

Across the 10 guideline documents, the committee identified 11 statements of recommendation. The majority of recommendations mapped to narrative reviews, background documents, and/or technical documents. One recommendation from the ESPGHAN guideline document (Fewtrell et al., 2017) mapped to a systematic literature search.

MEAL FREQUENCY

Five guideline documents included recommendations related to meal frequency (see Appendix B, Table B-24). Two of the guideline documents were collaborative efforts between two or more organizations (Health Canada et al., 2014; PAHO/WHO, 2003). One of the collaborating organizations also had a separate relevant guideline document. As such, the identified guideline documents reflect eight organizations from Canada and the United States, along with PAHO and WHO.[14]

Consistent Meal Schedule During the Complementary Feeding Period

Four guideline documents included recommendations on meal schedule and complementary foods. Three guideline documents recommended that a regular meal schedule be established (Gidding et al., 2005 [AHA]; Health Canada et al., 2014; Pérez-Escamilla et al., 2017 [RWJF-HER]). Two of the guideline documents recommended increasing the number of times per day that complementary foods are offered as an infant ages (Health Canada et al., 2014; PAHO/WHO, 2003). One guideline put forth the concept that it is the caregiver's responsibility to determine when and what food is eaten (Gidding et al., 2005 [AHA]).

Consistency

The guideline documents were generally consistent in recommending that a regular meal schedule should be established.

Evidence Base

Across the four guideline documents, the committee identified six statements of recommendation. All of the recommendations mapped to

[14] Organizations reflected in the guideline documents include AHA, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, Health Canada, PAHO, RWJF-HER, and WHO.

narrative reviews or technical background documents, either alone or in combination with another resource.

Age and Number of Eating Occasions

Three guideline documents included recommendations on age and number of eating occasions. A guideline document from RWJF-HER recommended three meals and two to three snacks daily once the child reaches 1 year of age (Pérez-Escamilla et al., 2017). A guideline document from WHO stated that for nonbreastfed infants, "meals should be provided 4–5 times per day with additional nutritious snacks offered 1–2 times per day as desired" (WHO, 2005);[15] this recommendation includes breast milk substitutes, if used. A guideline document from PAHO/WHO stated,

> For the average healthy breastfed infant, meals of complementary foods should be provided 2–3 times per day at 6–8 months of age and 3–4 times per day at 9–11 and 12–24 months of age. Additional nutritious snacks may be offered 1–2 times per day, as desired. (PAHO/WHO, 2003)[16]

Consistency

The guideline documents were generally consistent in recommending that infants and young children need several eating occasions over the course of the day, including both meals and snacks. However, the recommended number of meals and snacks slightly varied across the recommendations. One reason for this inconsistency is that one of the recommendations only pertained to the provision of complementary foods to breastfed children (PAHO/WHO, 2003), while another recommendation pertained to eating events for the nonbreastfed child, inclusive of the provision of breast milk substitutes (WHO, 2005).

Evidence Base

Across the three guideline documents, the committee identified three statements of recommendation. Two of the recommendations mapped to narrative reviews or background documents (PAHO/WHO, 2003; Pérez-Escamilla et al., 2017). The other recommendation was "based on theoreti-

[15] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Meal Frequency and Energy Density, p. 10, Copyright (2005).

[16] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Meal Frequency and Energy Density, p. 21, Copyright (2003).

cal estimates of the number of feedings required, calculated from energy requirements and gastric capacity" (WHO, 2005).[17]

Number of Feedings and Energy Density

Two guideline documents included recommendations relating the minimum number of feedings to the energy density of the diet. Both stated that the "number of feedings depends on the energy density and the usual amounts consumed at each feeding" (PAHO/WHO, 2003; WHO, 2005)[18,19] and also noted that if energy density is low, more frequent meals may be needed.

Consistency

The two guideline documents were consistent in recommending that the minimum number of feedings should be based on the energy density of the diet. The same verbatim language was used in both guideline documents.

Evidence Base

Across the two guideline documents, the committee identified two statements of recommendation. The recommendation from PAHO/WHO (2003) mapped to a background document. The recommendation from WHO (2005) mapped to "theoretical estimates of the number of feedings required, calculated from energy requirements and gastric capacity."[20]

HUNGER AND SATIETY CUES

Seven guideline documents included recommendations related to hunger and satiety cues (see Appendix B, Table B-25). Three of the guideline documents were joint efforts (Alvisi et al., 2015; Health Canada et al., 2014; PAHO/WHO, 2003); WHO participated in two of the guideline documents. The identified guideline documents therefore reflect 11 differ-

[17] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Meal Frequency and Energy Density, p. 10, Copyright (2005).

[18] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Meal Frequency and Energy Density, p. 21, Copyright (2003).

[19] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Meal Frequency and Energy Density, p. 10, Copyright (2005).

[20] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Meal Frequency and Energy Density, p. 10, Copyright (2005).

ent organizations from Canada, Europe, Italy, and the United States, along with PAHO and WHO.[21]

Using Hunger and Satiety Cues to Guide Infant and Child Feeding

Seven guideline documents included recommendations related to hunger and satiety cues. Of these, six advised that infant or child satiety cues or hunger signs should guide feeding (Fewtrell et al., 2017 [ESPGHAN]; Gidding et al., 2005 [AHA]; Health Canada et al., 2014; PAHO/WHO, 2003; Pérez-Escamilla et al., 2017 [RWJF-HER]; WHO, 2005). Recommendations from two guideline documents specifically underscored the importance of child self-regulation of intake (Alvisi et al., 2015 [SIAIP and SIGENP]; Gidding et al., 2005 [AHA]), while another guideline document described the natural ability for appetite control (Pérez-Escamilla et al., 2017 [RWJF-HER]). Three guideline documents encouraged responsive feeding practices (Health Canada et al., 2014; PAHO/WHO, 2003; WHO, 2005), with PAHO/WHO (2003) and WHO (2005) describing strategies such as talking during feeding, eye contact, minimizing distractions, and strategies for managing food refusal. Four guideline documents warned against forced or pressured feeding (Gidding et al., 2005 [AHA]; PAHO/WHO, 2003; Pérez-Escamilla et al., 2017 [RWJF-HER]; WHO, 2005); two guideline documents warned against using food as a reward (Fewtrell et al., 2017 [ESPGHAN]; Pérez-Escamilla et al., 2017 [RWJF-HER]).

The recommendations covered a variety of different age groups. Recommendations from the collaborative guideline document from Canada specified older infants (6–12 months) and young children (12–24 months) (Health Canada et al., 2014). The RWJF-HER recommendations pertained to three different age groups: up to 6 months, 6–12 months, and 12–24 months (Pérez-Escamilla et al., 2017). The WHO (2005) guideline document focused on nonbreastfed children 6–24 months of age, while the PAHO/WHO (2003) recommendations pertained to breastfed children 6–24 months of age. The AHA (Gidding et al., 2005) and ESPGHAN (Fewtrell et al., 2017) guideline documents did not specify an age group for their recommendations.

Consistency

The guideline documents were generally consistent in emphasizing the importance of hunger and satiety cues in infant and child feeding. There was also consistency across organizations in support of the importance of

[21] Organizations reflected in the guideline documents include AHA, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, ESPGHAN, Health Canada, PAHO, RWJF-HER, SIAIP, SIGENP, and WHO.

responsive parenting or feeding practices in addressing hunger and satiety cues among infants and children.

Evidence Base

Across the seven guideline documents, the committee identified 10 statements of recommendation. The majority of recommendations mapped to narrative reviews, background documents, and technical documents. The recommendation from the ESPGHAN guideline document (Fewtrell et al., 2017) mapped to a systematic literature search.

RESPONSIVE FEEDING

Nine guideline documents included recommendations related to responsive feeding (see Appendix B, Table B-26). Three of the guideline documents were collaborative efforts from two or more organizations (Alvisi et al., 2015; Health Canada et al., 2014; PAHO/WHO, 2003); WHO participated in two of the guideline documents. As such, the identified guideline documents reflect 13 different organizations from Australia, Canada, Italy, the United Kingdom, and the United States, along with PAHO and WHO.[22]

Feeding Environment

Seven guideline documents included recommendations related to the feeding environment. Three stated the need for a pleasant feeding environment (PAHO/WHO, 2003; Pérez-Escamilla et al., 2017 [RWJF-HER]; WHO, 2005). Four guideline documents recommended that caregivers and other family members be role models through their own eating practices (Alvisi et al. 2015 [SIAIP and SIGENP]; Gidding et al., 2005 [AHA]; Health Canada et al., 2014; NICE, 2008).

Recommendations from six of the guideline documents discussed the need for nurturing verbalization (PAHO/WHO, 2003; Pérez-Escamilla et al., 2017 [RWJF-HER]; WHO, 2005), for eye-to-eye contact between caregiver and child (PAHO/WHO, 2003; WHO, 2005), to not force the child to eat (PAHO/WHO, 2003; Pérez-Escamilla et al., 2017 [RWJF-HER]; WHO, 2005), to avoid distractions during feeding (Pérez-Escamilla et al., 2017), and for eating together as a family (Alvisi et al., 2015 [SIAIP and SIGENP]; Gidding et al., 2005 [AHA]; NICE, 2008).

[22] Organizations reflected in the guideline documents include AHA, Breastfeeding Committee for Canada, CPS, Dietitians of Canada, Health Canada, NHMRC, NICE, PAHO, RWJF-HER, SACN, SIAIP, SIGENP, and WHO.

Consistency

The guideline documents were generally consistent in recommending that the feeding environment should be pleasant and that caregivers should implement nurturing behaviors including verbalization, eye-to-eye contact, and not forcing the child to eat.

Evidence Base

Across the seven guideline documents, the committee identified 13 statements of recommendation. The majority mapped to narrative reviews, background documents, and technical documents, alone or in combination with other resources. The recommendation from the NICE (2008) guideline document mapped to a UK Department of Health report (Department of Health, 1994) and a rapid review.

Repeated Exposure

Five guideline documents included recommendations related to repeated exposure. All stated the importance of repeated exposure to help children accept new foods (Gidding et al., 2005 [AHA]; PAHO/WHO, 2005; Pérez-Escamilla et al., 2017 [RWJF-HER]; SACN, 2018; WHO, 2005). Of these, one stated that acceptance of vegetables takes more tries than is the case for fruits (Pérez-Escamilla et al., 2017).

Consistency

The guideline documents were consistent in recommending that repeated exposure is needed for children to accept new foods.

Evidence Base

Across the five guideline documents, the committee identified six statements of recommendation. All statements mapped to narrative reviews.

Self-Feeding and Self-Regulation

Six guideline documents included recommendations related to self-feeding and self-regulation. All emphasized the importance of encouraging self-feeding and self-regulation (Alvisi et al., 2015 [SIAIP and SIGENP]; Health Canada et al., 2014; NHMRC, 2012; PAHO/WHO, 2003; Pérez-Escamilla et al., 2017 [RWJF-HER]; WHO, 2005). Recommendations stated that the infant should decide how much to eat (Pérez-Escamilla et al., 2017),

including new foods that are introduced (Alvisi et al., 2015). One guideline document recommended feeding infant formula based on need rather than the quantity stated in infant formula packaging (NHMRC, 2012).

Consistency

The guideline documents were generally consistent in recommending that self-feeding and self-regulation should be encouraged in infants and toddlers.

Evidence Base

Across the six guideline documents, the committee identified eight statements of recommendation. Most mapped to narrative reviews, background documents, and technical documents. One recommendation from an Australian Government guideline document (NHMRC, 2012) could not be mapped to its evidence.

SUMMARY

Guideline documents from government agencies and authoritative organizations provide a variety of recommendations related to how to feed infants and young children. Recommendations on the same topic areas were often conceptually consistent, but slightly differed from each other in the details. The vast majority of recommendations were mapped to narrative reviews. A summary of the committee's findings regarding consistency of recommendations is provided in Table 5-2.

TABLE 5-2 Summary of the Consistency of Recommendations on How to Feed Infants and Young Children, by Topic Area

Topic Area	Summary of Consistency Across Recommendations
Bottle use and propping	• Generally consistent in recommending against certain foods and fluids being added to bottles • Generally consistent in recommending that bottle use be discontinued at about 12 months of age • Generally consistent in recommending that infants not go to bed or to sleep with a bottle • Consistent in recommending against bottle propping
Cup use	• Generally consistent in recommending that infants should transition to cups at 6–12 months of age • Generally consistent in recommending that milk should be served to toddlers in a cup

TABLE 5-2 Continued

Topic Area	Summary of Consistency Across Recommendations
Safety of foods and feeding practices	• Consistent in recommending that milk, milk products, and juice given to children should be pasteurized • Consistent in recommending against giving honey to children under 1 year of age due to risk of botulism • Generally consistent in recommending against consumption of raw or undercooked eggs • Consistent in advising about choking hazards, although examples provided varied across guideline documents • Consistent in recommending that infants and young children be supervised while eating
Introduction of complementary foods	• Generally consistent in recommending that complementary foods not be introduced before 4 months of age nor delayed to after 6 months of age • Not consistent in whether the recommended age of introduction is an age range (4–6 months) or is focused on introduction at (approximately) 6 months • Consistent in recommending that the first foods offered to infants be iron rich or iron fortified • Consistent in recommending gradual introduction of new foods
Food consistency and texture	• Consistent in recommending that food consistency and texture be tailored to the developmental needs of the child • Consistent in recommending that consistencies and textures of foods offered should change as the child gets older
Meal frequency	• Generally consistent in recommending that a consistent meal schedule be established • Generally consistent in recommending that young children need several eating occasions, both meals and snacks, over the course of the day
Hunger and satiety cues	• Generally consistent in emphasizing the importance of using hunger and satiety cues to guide infant and child feeding
Responsive feeding	• Generally consistent in recommending that the feeding environment be pleasant and include nurturing behaviors (e.g., verbalization, eye-to-eye contact, not forcing the child to eat) • Consistent in recommending that repeated exposure is needed for children to accept new foods • Generally consistent in recommending that self-feeding and self-regulation be encouraged in infants and toddlers

NOTE: The committee uses the following phrases to describe consistency of recommendations:

- *Consistent* indicates alignment across the recommendations.
- *Generally consistent* indicates that the recommendations tended to provide similar guidance, although there were some differences in details or wording.
- *Some inconsistencies* indicates mixed recommendations, some of which align.
- *Not consistent* indicates recommendations providing different guidance on a topic.

6

Communication and Dissemination

Chapter Highlights

- The feeding guideline documents most often focused on health care providers as a critical nexus for changing caregiver practices, with fewer specifically targeting parents and guardians, early care and education providers, program administrators, or policy makers.
- Some guideline documents acknowledged the importance of adapting or tailoring the messages to specific populations or target audiences.
- Passive approaches to disseminating recommendations may have limited effectiveness with regard to incorporation of guidance into clinical care and uptake.
- Consistent and transparent reporting and evaluation of dissemination activities is needed to assess effects on the target outcomes, and to help inform decision making.

Guideline documents and recommendations for feeding infants and young children have been developed across many countries by government agencies, professional groups, and nonprofit organizations. Improving knowledge, attitudes, and feeding practices for children under 2 years, however, requires more than simply providing the information in a guideline document. Effective communication and dissemination of information

is necessary to ensure that health care providers, parents, caregivers, and others are educated about the feeding recommendations, thereby improving their diffusion and uptake. As these concepts are fundamental to the use of the feeding guidance, the committee was asked to assess the guideline documents for descriptions of best practices and implementation strategies to support communication and dissemination of feeding recommendations (see Chapter 1, Box 1-1). The committee's charge did not stipulate a broad, comprehensive review of communication and dissemination strategies, but rather directed the committee to summarize what could be gleaned from the feeding guideline documents it reviewed. The committee, therefore, looked for information about communication and dissemination strategies within the eligible guideline documents, and drew on select examples from its exploratory scans (for more detail on the methodology, see Chapter 2).

DEFINING TERMINOLOGY

Different groups and disciplines use the terms *communication*, *dissemination*, and *implementation* in various ways. Communication and dissemination are sometimes viewed as synonyms and have been used interchangeably. The committee, within the context of public health and a clinical practice audience (AHRQ, 2012), considered these three concepts interrelated but distinct. For developing and implementing feeding evidence-based guidelines, *communication* is the broadest of the three concepts, and occurs over the course of the entire guideline process as a way to provide information and influence decisions and actions of a target audience.[1] *Dissemination*, by comparison, happens when the evidence-based guidelines are complete and consists of actively engaging with the target populations through identified channels and strategies to spread the recommendations. *Implementation* focuses on the integration and effect of the evidence-based guidelines once they are disseminated within a setting. The definitions underpinning the committee's approach to this portion of its task are presented in Box 6-1.

Implementation strategies involve complex, multisector processes, within which dissemination strategies play an important role (Leeman et al., 2017). The feeding guideline documents reviewed by the committee did not describe implementation strategies, as defined in Box 6-1. Accordingly, the committee focused on information contained within the guideline docu-

[1] A subset of communication is health communication, which has been defined as "the study and use of communication strategies to inform and influence decisions and actions to improve health" (CDC, 2020). For consistency with the committee's charge, it uses the term *communication* throughout, but acknowledges that the goal of communication related to feeding guidelines is generally to inform and influence parents' and caregivers' actions related to what and how they feed their infants and young children.

BOX 6-1
Definitions of Key Terms

Communication: "Inform[ing] and influenc[ing] decisions and actions" in a target audience (CDC, 2020)

Communication strategy: The approaches used to provide information in an effort to change knowledge, attitudes, and/or behaviors in a target audience

Dissemination: An active attempt to spread an evidence-based intervention to a target audience through identified channels and planned strategies

Dissemination strategy: The description of mechanisms and approaches used to communicate and spread information about evidence-based interventions to a target population

Implementation: "The process of putting to use or integrating evidence-based interventions within a setting" (Rabin and Brownson, 2018, p. 22)

Implementation strategy: "Approaches or techniques used to enhance the adoption, implementation, sustainment, and scale-up (or spread) of an [evidence-based intervention within a particular setting]" (Kirchner et al., 2020)

SOURCES: CDC, 2020; Kirchner et al., 2020; Perry et al., 2019; Powell et al., 2015; Procter et al., 2013; Rabin and Brownson, 2018; Rural Health Information Hub, 2020; Swindle et al., 2019.

ments concerning changing knowledge, attitudes, or behaviors related to feeding children under 2 years of age, and the channels by which to spread feeding guidance. In this chapter, the committee summarizes communication and dissemination strategies described in the guideline documents, discusses select examples of additional communication and dissemination materials for some of the target audiences, and provides its reflections on the identified strategies. The committee was not tasked with determining the effectiveness of the identified approaches.

IDENTIFIED COMMUNICATION AND DISSEMINATION STRATEGIES FOR VARIOUS TARGET AUDIENCES

As described in Chapter 2, the committee used a multipronged approach to explore feeding guideline communication and dissemination strategies. Each eligible guideline document was reviewed to identify specific guidance related to communicating and disseminating the feeding recommendations. Of the 43 guideline documents reviewed, 25 included a statement or sec-

tion related to communication or dissemination (see Table 6-1). The communication and dissemination guidance varied in length and content. For instance, in the American Academy of Pediatrics (AAP) guideline on fruit juice, there was a single sentence: "Pediatricians should routinely discuss the use of fruit juice and fruit drinks and should educate older children, adolescents, and their parents about differences between the two" (Heyman

TABLE 6-1 Summary of Eligible Guideline Documents That Included Information About Communication and Dissemination

Organization(s)	Citation	Target Audience(s)
AAFP	AAFP, 2014	Health care providers
AAP	AAP Section on Breastfeeding, 2012	Health care providers
	Baker-Smith et al., 2019	Health care providers
	Heyman et al., 2017	Health care providers
	Golden et al., 2014	Health care providers
AAP; AAPD	AAPD, 2016	Health care providers
AAPD	AAPD, 2017	Health care providers
AND	AND, 2016	Health care providers
Australian government, NHMRC	NHMRC, 2012	Health care providers
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Health care providers
	Health Canada et al., 2015[b]	Health care providers
CPS	Grueger et al., 2013[c]	Health care providers
ESPGHAN	Braegger et al., 2013	Health care providers
	Domellöf et al., 2014	Not specified
	Fidler Mis et al., 2017	Health care providers; policy makers
New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	Health care providers
New Zealand Ministry of Health	Ministry of Health, 2012	Health care providers; program administrators

et al., 2017). In contrast, the 2005 WHO guideline document on feeding nonbreastfed infants 6–24 months provided an annex that describes 13 steps for developing locally appropriate recommendations based on the information contained within the document (WHO, 2005).

Provides Additional Resources, Links, or Tools	Promotes Education, Support, or Advocacy	Provides Discussion Points	Identifies Important Groups to Receive Message	Other
X				
X	X			
		X		
	X			
	X			
	X			
	X			
X	X			
X				X[a]
		X		
		X		
X[d]				
				X[e]
			X	
				X[f]
	X			X[g]
X			X	

continued

TABLE 6-1 Continued

Organization(s)	Citation	Target Audience(s)
NICE	NICE, 2008	Health care providers; policy makers
NIH	Togias et al., 2017	Health care providers
PAHO, WHO	PAHO/WHO, 2003	Community leaders; health care providers; policy makers; program administrators
RCPCH	RCPCH, 2019[k]	Health care providers; policy makers
RWJF-HER	Lott et al., 2019	Advocates; health care providers; parents
	Pérez-Escamilla et al., 2017	Early care and education providers; health care providers; parents
SACN; COT	SACN and COT, 2018	Policy makers
WHO	WHO, 2005	Policy makers; program administrators

[a] Provided a stand-alone summary document of the recommendations.
[b] No date was provided for this resource. Year in citation reflects year the webpage was last updated. The text of the resource indicates it preceded Health Canada et al. (2014).
[c] Reaffirmed in 2018.
[d] Resources were specifically for parents.
[e] The guideline document included discussion of policy implications related to the recommendations.
[f] The guideline document includes recommendations on definitions that should be used in regulations and a call to action for policies that support the recommendations.
[g] The guideline document noted that the materials can be modified to be age-appropriate and respond to families' needs.
[h] The guideline document includes an explanation of how the work can facilitate work of national and local organizations.
[i] An appendix provides guidance for parents to execute one of the recommendations contained within the document.
[j] States that stakeholders can use the information in the guideline document to message appropriately.

Provides Additional Resources, Links, or Tools	Promotes Education, Support, or Advocacy	Provides Discussion Points	Identifies Important Groups to Receive Message	Other
X				X[b]
X[i]				
				X[j]
X	X			
				X[l]
				X[m]
				X[n]
				X[o]

[k] Date reflects year the webpage was last modified. The post date is listed as 2017.

[l] The guideline document explained that the recommendations "provide consistent messages that can be used by health care providers, public health practitioners, and parents and caregivers."

[m] Provides context for the systems-level approach to overcoming barriers for implementation.

[n] Includes some recommendations that embed guidance on the action governments should take and how advice should be stated.

[o] Describes steps for developing locally appropriate feeding recommendations based on the guideline document.

The committee also drew on materials discovered through its targeted website searches and the screening process to serve as demonstrative examples. The committee found a vast and heterogeneous landscape of webpages, PDF documents, newsletters, videos, podcasts, toolkits, key messages, and other types of resources widely and readily available. It would have been an insurmountable task to catalog all of these materials. Rather, the scan served to identify examples of materials that convey feeding recommendations to various audiences.

Approaches Categorized by Target Audience of Guideline Document

Most of the guideline documents the committee reviewed were specifically developed for one or more target audiences, with a large majority aimed at health care providers (e.g., physicians, nurse practitioners, nurses, dentists, registered dietitian nutritionists, and other nutrition professionals). Other target audiences included parents and guardians, early childhood education providers, program administrators, and policy makers. Communication and dissemination approaches were varied across these different target audiences.

Health Care Providers

Feeding guideline documents most often focused on health care providers as a critical nexus for changing caregiver practice. The guideline documents reviewed by the committee often sought to promote awareness, attitudes, knowledge, and the adoption of feeding recommendations at the individual provider or practice level. Some guideline documents included additional or external resources for health care professionals (AAFP, 2014; AAP Section on Breastfeeding, 2012; AND, 2016; Ministry of Health, 2012; NHMRC, 2012; NICE, 2008; RCPCH, 2019). Three guideline documents included explicit discussion points that could be used to communicate the recommendations to families (Baker-Smith et al., 2019; Health Canada et al., 2014, 2015). Three mentioned adapting the information within the guideline document to be more relevant or messaged appropriately (New Zealand Dental Association, 2008; PAHO/WHO, 2003; WHO, 2005).

Parents and Guardians

Although the importance of providing parents and guardians with specific feeding guidance was acknowledged, these groups were infrequently the target audience for the guideline documents reviewed. Only two of the guideline documents, both from the Robert Wood Johnson Foundation-Healthy Eating Research (RWJF-HER), specifically mentioned parents and

guardians as a target audience (Lott et al., 2019; Pérez-Escamilla et al., 2017). Lott et al. (2019) sought to "provide consistent messages that can be used by health care providers, public health practitioners, and parents and caregivers." The publicly accessible webpage that hosts the guideline document includes a synopsis, along with an infographic that distills the recommendations and presents them by age group (HER, 2019). Similarly, Pérez-Escamilla et al. (2017) aimed to "empower caregivers to address the nutrition and well-being of infants and toddlers." On the webpage that hosts the Pérez-Escamilla et al. (2017) guideline document (HER, 2017), there is a link for a series of 12 videos for parents (1,000 Days, 2020); the video webpage was a collaborative effort among the Centers for Disease Control and Prevention, RWJF-HER, and 1,000 Days that provides "accessible and evidence-based information about what, when, and how to feed infants and toddlers."

Two of the guideline documents provided additional resources or tools specifically for parents and guardians, despite parents and guardians not being a primary target audience of the guideline document itself. The end of a guideline document from the Canadian Paediatric Society (CPS) listed three references as being "resources for parents" (Grueger et al., 2013). The 2017 *Addendum Guidelines for the Prevention of Peanut Allergy in the United States* included an appendix providing parents and guardians with instructions for feeding peanut protein to low-risk infants at home (Togias et al., 2017). Two guideline documents authored by a consortium of Canadian organizations—Breastfeeding Committee for Canada, CPS, Dietitians of Canada, and Health Canada—were more indirect with regard to guidance for parents (Health Canada et al., 2014, 2015). Both guideline documents provided information and ideas about how to answer the questions of parents and caregivers, but they did not provide direct communication tools for this audience in these online resources.

A host of online resources are available to parents and guardians, but they are sometimes inconsistent in directly mapping back to a guideline document. For instance, one of the Canadian consortium partners, CPS, used its guideline documents in its own communication and dissemination efforts. CPS hosts a website to provide information directly to parents (CPS, 2020). The webpage on breastfeeding provides detailed information for mothers and provides links to additional resources (CPS, 2018), two of which were the collaborative guideline documents in which it participated (Health Canada et al., 2014, 2015). CPS's parent and guardian guidance on vitamin D (CPS, 2016) also hyperlinks the organization's position statement on the topic (Godel et al., 2007). AAP also hosts a parenting website (AAP, 2020). Although the website includes guidance on feeding infants and young children, the guidance does not directly map back to specific guideline documents.

Early Care and Education (ECE) Providers

Despite being integral players in infant and young child feeding, ECE providers were often not the target audience of the guideline documents the committee reviewed. Only one guideline document specifically mentioned ECE providers (Pérez-Escamilla et al., 2017), and none exclusively focused on ECE providers as the primary audience. Nevertheless, ECE providers are not without guidance; a number of resources related to infant feeding are available to this audience.

In the United States, a key resource available to ECE providers and others who care for children is *Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs* (*Caring for Our Children*) (AAP et al., 2019). *Caring for Our Children* is a collaborative effort among AAP, the American Public Health Association, and the National Resource Center for Health and Safety in Child Care and Early Education; it contains national standards that "represent the best evidence, expertise, and experience in the country on quality health and safety practices and policies that should be followed in today's early care and education settings" (AAP et al., 2019, p. xvii). Many of the standards in *Caring for Our Children* focus on how, what, and when to feed infants and young children. Although not the primary source of feeding recommendations, *Caring for Our Children* was designed to reflect guidance put forth by other authoritative organizations like AAP, the federal Child and Adult Care Food Program (CACFP),[2] or federal nutrition guides from the U.S. Department of Agriculture (USDA). The specific guidance in the standards, however, does not always directly map to guideline documents or federal standards, although references are provided. In addition to the primary *Caring for Our Children* document, there are a number of other ancillary resources to help ECE providers implement the standards (e.g., tip sheets). Thus, *Caring for Our Children* serves as an example for how feeding recommendations from authoritative bodies are translated and then communicated and disseminated to "on the ground" providers in ECE settings through both a primary comprehensive resource and secondary materials to help providers implement the standards.

Program Administrators

Program administrators play an important role in implementing feeding guidance and serving as a conduit for information for both program participants and staff. Across the guideline documents the committee reviewed, few noted program administrators as a key target audience. Those that did

[2] In particular, 7 CFR § 226.20.

envisioned that the recommendations would inform and serve as the basis for health and nutrition programs (Ministry of Health, 2012; PAHO/WHO, 2003; WHO, 2005). As is the case for ECE providers, there are important documents that specifically communicate and disseminate feeding guidance to program administrators, but they largely exist outside of the guideline documents the committee reviewed. Two U.S. national programs with such guidance are CACFP and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

Administered by the USDA Food and Nutrition Service (FNS), CACFP provides reimbursement for eligible meals and snacks served to qualifying children in participating ECE programs.[3] USDA recently revised the CACFP rule to include a number of updates to improve children's nutritional intake to better align with the *Dietary Guidelines for Americans*, as required by the Healthy, Hunger-Free Kids Act of 2010 (USDA, 2016). The recent CACFP rule changes guidance to program administrators on meeting the new requirements. One way in which this information was communicated to program administrators was through the document *Feeding Infants in the Child and Adult Care Food Program* (USDA-FNS, 2019a). This resource provides extensive practical information on how to comply with the new rule, and includes resources such as meal patterns, pictures, and example vignettes. *Feeding Infants in the Child and Adult Care Food Program* is an example of how feeding recommendations, together with policies and federal regulations, are synthesized and communicated to program administrators.

WIC, also administered through USDA-FNS, provides "nutritious foods to supplement diets, nutrition education (including breastfeeding promotion and support), and referrals to health and other social services" to low-income, nutritionally at-risk women, infants, and children up to age 5 (USDA-FNS, 2020). USDA-FNS recently released *Infant Nutrition and Feeding: A Guide for Use in WIC* (USDA-FNS, 2019b), designed to be a research-based resource for WIC staff who counsel program participants. The guide notes it "can assist staff in disseminating appropriate and accurate information to participants. It is a resource for planning individual counseling sessions, group classes, and staff in-service training sessions" (USDA-FNS, 2020).

Policy Makers

The guideline documents summarized in Table 6-1 that identify policy makers as a target audience did not appear to be designed to reach policy makers directly (Fidler Mis et al., 2017; NICE, 2008; PAHO/WHO, 2003; RCPCH, 2019; SACN and COT, 2018; WHO, 2005). Each included only a

[3] CACFP also serves those who are eligible in adult care programs.

brief reference to policy makers. For example, a guideline document for the UK government on the introduction of peanuts and hen's eggs into infant's diets included a brief section on recommendations for government that states:

> The government should continue to recommend exclusive breastfeeding for around the first 6 months of life.... Advice on complementary feeding should state that foods containing peanut and hen's egg need not be differentiated from other complementary foods. Complementary foods should be introduced in an age-appropriate form from around 6 months of age, alongside continued breastfeeding, at a time and in a manner to suit both the family and individual child.... The deliberate exclusion of peanut or hen's egg beyond 6 to 12 months of age may increase the risk of allergy to the same foods. Once introduced, and where tolerated, these foods should be part of the infant's usual diet, to suit both the individual child and family. If initial exposure is not continued as part of the infant's usual diet, then this may increase the risk of sensitisation and subsequent food allergy.... Families of infants with a history of early-onset eczema or suspected food allergy may wish to seek medical advice before introducing these foods. (SACN and COT, 2018, pp. 11–12)

Similarly, a Royal College of Paediatrics and Child Health (RCPCH) guideline document noted that the organization "strongly support[s] national policies, practices, and legislation that are conducive to breastfeeding" (RCPCH, 2019, p. 3). In addition, the document contained specific calls to action for policy makers by stating, for instance:

> RCPCH calls on: The NHS [National Health Service] in England and the Welsh Government to follow the lead of the Scottish Government and the NHS in Northern Ireland by requiring all maternity services to achieve and maintain Unicef U.K. Baby Friendly Initiative accreditation; this requirement is currently met by all maternity units in Scotland and Northern Ireland. (RCPCH, 2019, p. 4)

The guideline documents the committee reviewed provided a few examples of approaches to communicating the recommendations directly to policy makers. One approach taken was to clearly identify the government as the entity that needed to carry out the recommendation. This strategy is contingent on policy makers identifying and understanding the guideline recommendation. Another approach was an organizational call to action for policies that support the recommendation.

Reflections on Identified Strategies

The guideline documents the committee reviewed were limited in their descriptions of best practices or approaches to communication and dissemi-

nation of the feeding recommendations. Many of the guideline documents were designed for health care providers, who were intended to serve as intermediaries in providing the information to other audiences, particularly parents and guardians. This approach assumes that the health care providers have the skills, time, and resources to be able to individualize and communicate the recommendations in the context of their particular patient population needs or situations.

Some of the guideline documents acknowledged the importance of adapting or tailoring the messages to make them relevant to a particular group or audience with respect to characteristics including socioeconomic status, language and reading comprehension level, food security, age and stage of infant, ethnicity, and cultural practices. For example, the World Health Organization (WHO, 2005) guideline document dedicated an annex to adapting the guidelines for locally appropriate feeding recommendations that are culturally appropriate and affordable, including in resource-poor settings. A guideline document from New Zealand (Ministry of Health, 2012) includes a chapter for Māori infants and toddlers that addresses considerations related to the cultural and spiritual significance of food in the Māori culture. The guideline document also highlights the special needs of Pacific, Asian, and other population groups, especially newly immigrated groups that may have language barriers, low incomes, and challenges related to acculturation. Such examples underline the need to consider equity issues and the characteristics of target audiences in developing tools and approaches for conveying recommendations to parents and guardians (Russel et al., 2016; Schafer et al., 2016), especially in light of an increasing recognition of the association between social determinants of health and persistently observed health disparities.

With the end goal being widespread uptake of the recommendations, consideration needs to be given to how parents and guardians identify resources on infant feeding and what types of resources are most effective. In a study among first-time mothers in Australia, information on breastfeeding was frequently sought from online sources, as well as from health care providers and print sources (Newby et al., 2015). Another study reported that although mothers may be aware that feeding guidelines exist, they may not know the specific recommendations (Begley et al., 2019). The changing landscape of mobile health devices and applications and the role of social networks in influencing knowledge, attitudes, and behaviors have potentially important implications for developing effective strategies for disseminating feeding recommendations to various stakeholders, including parents and guardians, and merit further exploration.

There is little information available as to where and how ECE providers seek guidance on infant and young child feeding or the extent to which regulatory mechanisms determine feeding practices. A survey of ECE providers

in the United Kingdom found that about half obtained information from national reports, but some providers conducted online searches, sought guidance from ECE professional societies, or solicited health care providers (Benjamin Neelon et al., 2015). There is a clear need to better understand effective communication and dissemination techniques for ECE providers.

The communication and dissemination needs of program administrators, with respect to feeding guidelines, appear to be two-fold: (1) they need to understand the recommendations themselves, and (2) they need to understand how to parlay that information into programmatic action or advice for program participants. Unlike some of the other target audiences, program administrators (especially for federal programs) must follow specific regulations for operations.

The goal of communicating and disseminating feeding recommendations to policy makers is to assist them in the creation of evidence-based law or policy. In general, policy makers may adopt and codify recommendations created by professional societies or governments; these laws or policies are then implemented in various settings. Documents and other resources that are explicitly designed to reach policy makers are typically brief and relatively straightforward. They appeal to the issues that are important to policy makers and are often tailored to this specific audience. Cairney and Kwiatkowski (2017, pp. 4–5) outline three strategies for effective communication with policy makers: (1) understand your audience and tailor your response, (2) identify windows of opportunity, and (3) engage with real-world policy making rather than waiting for a rational and orderly process to appear. These strategies could be used by health professionals, public policy groups, and other stakeholders to promote the feeding recommendations put forth by authoritative organizations.

CONSIDERATIONS FOR COMMUNICATION AND DISSEMINATION STRATEGIES

Passive communication and dissemination strategies (e.g., use of websites to promote awareness, educational materials, scientific publications) provide access to information regarding recommendations, but they depend on providers, parents, and others to seek out or find the information themselves (Brownson et al., 2018a). Dissemination does not occur spontaneously, and passive dissemination approaches via report and journal publications may be of limited effectiveness in facilitating widespread adoption of evidence-based practices (Brownson et al., 2018b; Powell et al., 2013; Shelton et al., 2020). There is an average 17-year lag for new information to be incorporated into routine general health care practice (Balas and Boren, 2000), a time lag that is even longer in underresourced communities. Planning for active dissemination by engaging stakeholders, using multiple

strategies (e.g., personalized or interactive strategies), and tailoring content to specific audiences has proven more effective in facilitating uptake and adoption of evidence-based recommendations (Brownson et al., 2013; Koh et al., 2020; Shelton et al., 2020). Application of dissemination and implementation science methods may accelerate the translation and real-world impact of feeding guidelines (Brownson et al., 2018a; Shelton et al., 2020).

Reporting on dissemination approaches might include information on the purpose, the strategy or action taken, target audience, the methods, timing, outcomes, and theoretical justification (Eccles et al., 2012; Powell et al., 2013; Proctor et al., 2013). For evaluative purposes, information on whether stakeholders were engaged, how strategies were customized and framed to the specific characteristics and needs of audiences, or other indicators of uptake (e.g., access to materials) or effect (e.g., knowledge of providers or parents) also need to be consistently addressed (Brownson et al., 2018b). The committee did not explore whether such evaluative processes had occurred. Consistent and transparent descriptions of dissemination activities will allow for comparison of the relative effectiveness of these approaches and their effect on target outcomes (Brownson et al., 2013).

SUMMARY

Most of the guideline documents targeted health care providers (e.g., physicians, nurse practitioners, nurses, dentists, registered dietitian nutritionists, and other nutrition professionals), and the communication and dissemination strategies appeared to rely on the practitioner to provide the information to parents and guardians. Parents and guardians were largely not specifically identified as a target audience for the guideline documents themselves. ECE providers in the United States have national standards that include how, what, and when to feed infants and young children. Program administrators must often implement and convey feeding recommendations in the context of programmatic rules and regulations, and some of the available communication resources focused on providing accessible, applied guidance for specific nutrition and food programs. Policy makers often have specific communication needs, particularly brief and straightforward messages. Some guideline documents positioned recommendations toward policy makers or included a call to action. Passive approaches to disseminating recommendations may have limited effectiveness with regard to incorporation of guidance into clinical care and uptake. Consistent and transparent reporting and evaluation of dissemination activities is needed to assess effects on the target outcomes, and to help inform decision making.

7

Conclusions and Future Directions

This chapter summarizes the committee's conclusions about the consistency of existing feeding recommendations for infants and children from birth to 24 months of age, and the types of evidence used. In highlighting areas of inconsistency and differences in evidence types, the committee comments on possible explanations for these apparent discrepancies. Considering the level of consistency seen across many recommendations, the committee provides comments on the ability to harmonize the process of developing feeding recommendations. The committee also offers a recommendation to support communication and dissemination of feeding guidance based on its review of compiled materials and its collective expertise. Finally, the committee identifies gaps in the evidence related to feeding recommendations and communication and dissemination of feeding guidance.

CONSISTENCY AMONG EXISTING FEEDING RECOMMENDATIONS AND TYPES OF EVIDENCE USED

Across the 26 topic areas related to *what to feed* and *how to feed*, the committee sorted the recommendations in the 43 guideline documents into a variety of different themes. For many of those themes, the recommendations from the various sources were consistent or generally consistent (i.e., some nuances in wording) (see Tables 4-3 and 5-2 in Chapters 4 and 5, respectively). When there was inconsistency, it often related to the specific ages or age ranges stated in the recommendation or the specific target group for the recommendation (see Box 7-1).

BOX 7-1
Examples of Inconsistencies Across Feeding Recommendations

Inconsistencies Related to Specific Age or Age Ranges

- For the recommended age of introduction of complementary foods, most recommendations stated "about" or "around" 6 months of age, but a few indicated an age range of 4–6 months.
- For continuation of breastfeeding, most recommended breastfeeding until at least 12 months of age, but several stated 2 years of age or older.
- For the recommended duration of use of infant formula for nonbreastfed or partially breastfed infants, most stated until 12 months of age but one guideline document gave an age range of 9–12 months.
- Some guideline documents recommended delaying any cow milk until after 12 months, while others stated that cow milk could be introduced at 9–12 months or even as early as 6 months.
- The recommended age of introduction of potentially allergenic foods varied somewhat.

Inconsistencies Related to Specific Target Group for the Recommendation

- Plant-based beverages were consistently not recommended for infants in general, but some recommendations aimed at vegetarians or vegans indicated that such beverages could be included in the diet to help meet needs for certain nutrients.
- Some organizations made recommendations about the timing of introduction of peanuts based on the infant's risk of peanut allergy, while others did not differentiate on that basis.
- Some organizations recommended vitamin D supplementation only for breastfed infants, while others made a general recommendation for all infants, including nonbreastfed infants.

For some themes, the committee could not determine consistency because there was only one recommendation on that theme or the recommendations were too heterogeneous in the type of advice offered (though not necessarily inconsistent). Examples of such themes include

- Avoiding use of nonnutritive sweeteners,
- Limiting the percentage of energy from sugar,
- Using vitamin C–rich foods to enhance iron absorption,
- Consuming iodine from foods,
- Recommended types of fat from foods, and
- Recommended bottle-feeding behaviors or types of bottles and cups to promote infant self-regulation of intake.

Lack of evidence for certain topics may account for why there was only one recommendation on some themes. It was sometimes challenging to judge the consistency of recommendations because of differences in wording and/or lack of clarity in the guidance documents. Similarly, it was sometimes difficult to determine which statements were intended to be formal feeding recommendations as opposed to simply providing feeding information. There were also instances where it was unclear if the guideline document identified was the most current guidance, or when guidance was considered out-of-date owing to the emergence of new evidence.

The type of evidence cited to support the recommendations was variable. Variations included whether a scientific review of the evidence formed the basis for each recommendation, and if so, the nature of the scientific review (e.g., systematic review or narrative review) and whether the evidence was graded (in the case of systematic reviews). In some cases, there was no explicit link between recommendations and supporting evidence and it was difficult to map recommendations to the evidence presented. Some organizations or consortia released multiple documents for different audiences, making it difficult to identify the original evidence base used to formulate the recommendations. Despite these challenges, the committee attempted to categorize the type of evidence presented in each document, or in some cases in supporting documents, for each theme.

Overall, most of the recommendations mapped to narrative reviews. For most of the themes, at least one of the recommendations mapped to a systematic review, but formal grading of the evidence and systematic indication of additional considerations related to the recommendations, such as potential benefits versus harms, side effects, or risks, was rare. For some themes, the guideline document indicated that there was little or no evidence to support a recommendation (e.g., for the use of nonnutritive sweeteners).

Some of the observed inconsistency across recommendations may stem from differences among organizations in the process used for review of the available evidence, the criteria for drawing conclusions from that evidence, and the process for developing the wording of the recommendations. Although some organizations conducted systematic reviews of the evidence for select topics, there is a relative paucity of published randomized controlled trials related to infant feeding, which limits the strength of the conclusions that can be drawn. Because of the challenges of conducting a formal systematic review, some organizations based their recommendations on "expert-informed" consensus, but this approach can result in different conclusions depending on which body of experts is involved in the process (Kredo et al., 2016).

Inconsistency across the recommendations reviewed by the committee could also be related to the dates of publication; for some topics, the

evidence has evolved substantially in recent years and older guideline documents may now be outdated, as was the case for food allergies. The cycle for updating guidelines may differ across organizations and may be driven by a set schedule (e.g., every 5 years), or by the availability of a substantial body of new evidence. In addition, there could be variability in recommendations stemming from differing objectives of the organization creating the guidance. For example, some organizations (such as dental health organizations) emphasize oral health, while others may emphasize short- or long-term health and developmental outcomes. Organizations also may have different target populations, such as a certain age range (e.g., infants versus toddlers) or geographic focus (e.g., recommendations for a specific country or population versus global recommendations). Finally, recommendations from organizations may also vary based on their interpretation of the risks versus the benefits of making certain recommendations.

Although there is often considerable variability in the wording of recommendations for feeding infants and children from birth to 24 months, the committee noted that many organizations had recommendations on the same topics, so there is potential for collaboration on feeding guidelines. In many cases, the differences in wording were subtle. Collaboration on feeding guidelines, starting at the development phase and continuing through the dissemination phase, is likely to facilitate the harmonization of guidance, as described below.

HARMONIZING THE DEVELOPMENT OF FUTURE FEEDING GUIDELINES

The guideline documents reviewed reflected a mix of approaches, indicating substantial opportunity to improve and ideally harmonize the planning, development, communication, and dissemination of future feeding guidelines across organizations. Established criteria for high-quality guidelines have been published (Brouwers et al., 2010a,b,c; Grimmer et al., 2014; IOM, 2011; Kredo et al., 2016; Qaseem et al., 2012; Schünemann et al., 2014; WHO, 2012). The sections below describe several key elements to consider during development of future guidelines and recommendations for feeding infants and young children, with respect to three aspects of this process: (1) planning to develop the guidelines, (2) developing the guidelines, and (3) planning for dissemination and implementation of the guidelines.

Planning to Develop the Guidelines

The theory of collaborative advantage suggests that involvement of multiple stakeholder organizations (or a consortium of organizations) starting from the planning stage of the feeding guideline process could be benefi-

cial (Vangen and Huxham, 2013). Collaboration allows for joint decisions related to the scope of the guidelines, the relevant stakeholders that should be included on the guidelines panel, and the process for establishing consensus and approval of the guidelines (Qaseem et al., 2012). If a formal systematic review of the evidence is to be conducted, which is considered best practice (Handu et al., 2018; IOM, 2011; Kredo et al., 2016; Qaseem et al., 2012; Schünemann et al., 2014; WHO, 2012), this process can be centralized to enhance quality and efficiency and reduce the cost and time burden for each participating organization.

The specialized skills and resources required to conduct a high-quality systematic review are often beyond the reach of an individual organization, which may result in reliance on narrative reviews (Allen and Olkin, 1999; McGowan and Sampson, 2005). Robust and frequent collaboration between organizations can also facilitate continued evolution of uniform standards for quality nutrition guidelines, avoid duplication of effort, and establish consistent guidance across organizations, with proper accommodations for specific audiences and contexts considered when finalizing the wording and presentation of recommendations and during the dissemination process. Harmonization of the *process* for developing feeding guidelines does not necessarily imply that the specific feeding recommendations need to be exactly the same across countries, communities, and professional organizations. In fact, the need to customize guidance for particular target audiences and contexts means that the wording and presentation of recommendations may vary, especially in the communication and dissemination products. However, general consistency is particularly important for reinforcing harmonized guidance to target audiences, such as health care providers, parents, and guardians.

Including key stakeholders, communication experts, and representatives of the target audience at the beginning stages can help to ensure that the final product is appropriately designed and disseminated (Gagliardi et al., 2015). These types of collaborators can help design formative and implementation research to identify barriers and facilitators to the uptake of recommendations by the target audiences (Gagliardi et al., 2015). This allows for adaptation for specific populations groups and setting up a feedback loop for continued fine-tuning of the recommendations in the future.

There are several existing examples of coordination among organizations to develop feeding guidelines for infants and young children, as noted in Chapter 3. Most of these were collaborations among organizations within a country (e.g., in Canada, among the Breastfeeding Committee for Canada, Canadian Paediatric Society, Dietitians of Canada, and Health Canada [Health Canada et al., 2014, 2015]), but there is also potential for cross-country collaboration. One example is the guideline recommendations produced by the European Society for Paediatric Gastroenterol-

ogy, Hepatology and Nutrition (ESPGHAN), a professional society whose membership spans most European countries (ESPGHAN, 2020). More broadly, a recent report has offered recommendations to unify the approach to developing nutrient reference values that would be acceptable globally (NASEM, 2018). A similar approach could be taken for infant and young child feeding guidelines.

Although involvement of multiple stakeholder organizations could be beneficial, there may be substantial challenges to this approach, particularly related to establishing collaborative goals and trust and to differences in cultural and leadership approaches (Vangen and Huxham, 2013). There needs to be active acknowledgment and management of inevitable differences and tensions that arise, to maximize collaborative advantage and avoid collaborative inertia, or the tendency for collaborative activities to progress slowly (Vangen and Huxham, 2013). There are existing frameworks, such as the theory of collaborative advantage and collective impact (Kania and Kramer, 2011; Vangen and Huxham, 2013), that explicitly outline considerations for effectively collaborating across organizations. The barriers described above can also negatively influence post hoc approval of guidelines from other organizations; it may be more difficult to address and effectively manage them after guideline development than when the other organizations are involved from the beginning (Kania and Kramer, 2011).

Developing the Guidelines

Established criteria for high-quality guidelines exist (IOM, 2011; Kredo et al., 2016; Qaseem et al., 2012; Schünemann et al., 2014; WHO, 2011) and have been operationalized into tools that can be used to assess guideline quality (AGREE Next Steps Consortium, 2017; Brouwers et al., 2010a,b,c; Grimmer et al., 2014). These criteria and tools recommend that the guidelines explicitly describe:

- The scope and purpose of the guideline, and who is meant to use it.
- How available evidence was identified (search process and selection of evidence that was reviewed) and over what period of time.
- How the available evidence was evaluated (e.g., quality of the evidence using an established grading system).
- Who formulated the guidelines from the available evidence. This includes their selection process, determination of their potential conflict of interests, and the areas of expertise and interest they represent. This also includes clearly indicating contributing organizations for collaborative guidelines.

- What was considered in addition to the available scientific evidence in the formulation of recommendations (e.g., clinical judgment; expert opinion; risks versus benefits; practicing clinician or consumer views, values, or preferences) and the process for establishing consensus within the guideline development group.
- The external review process.
- How the guideline is to be disseminated.
- The process and timeline for updating the guideline.

Additional steps can be taken to facilitate routine, timely and meaningful updates of feeding guidelines, such as:

- Including a systematic way to identify and prioritize research needs during the guideline process, listing them in the report in an easily identifiable way, and including steps within the communication and dissemination plan to communicate these research needs to researchers and funders;
- Planning how to integrate important new research findings from rapidly evolving areas (e.g., allergenic foods) into guidelines in a timely way; and
- Including the date of publication on all guideline documents and associated materials, and indicating if current guidance is meant to supersede previous guidance from the same organization.

If multiple guideline documents are released from one source for different audiences detailing different aspects of the development process, it would be useful to explicitly outline within each document how they fit together and provide a link to access each of the individual documents (e.g., in an appendix). In addition, the readability of future feeding guidelines can be improved by making the recommendations "specific," "unambiguous," and clearly identifiable in the text (AGREE, 2020; iCAHE, 2020). Supporting evidence, and any rating or ranking of the supporting evidence, ought to be clearly linked to each recommendation (AGREE, 2020; iCAHE, 2020). The system used to rate or rank the supporting evidence for a recommendation needs to be clearly identified and explained. In addition, guideline developers need to consider systematically communicating other considerations related to the recommendations, such as potential benefits versus harms, side effects, or risks (AGREE, 2020).

Finally, feeding guideline development may require additional consideration and consensus around some challenging aspects common to the field of nutrition, such as:

- The most appropriate tools to assess the quality of the available evidence (NASEM, 2017);
- The best way to establish and communicate recommendations when the systematic evidence review does not include randomized controlled trials, which may be challenging to conduct for some nutrition topic areas, such as breastfeeding (Hébert et al., 2016);
- The best way to establish and communicate recommendations when only expert consensus is available; and
- Whether there are any additional guideline criteria or process steps that should be included when consumers are the primary target audience of a guideline (as compared to health care professionals).

Topics for which there is little scientific evidence to support a feeding recommendation are very challenging not only for those making the recommendation, but also for health professionals, who need to provide some sort of guidance, and for parents who need to decide what to do. Health care providers need to know how to effectively communicate that there is uncertainty, guide consideration of risk versus benefit, and communicate their clinical judgment and experience to caregivers. Caregivers also need guidance on how to judge credible versus less credible sources of information, which recommendations are strongly supported by scientific evidence, and which practices allow more flexibility to incorporate family preferences and values without risking infant or child health.

Planning for Dissemination and Implementation of Guidelines

Effective and timely strategies are needed to support the communication, dissemination, and implementation of feeding guidance, and to promote the systematic uptake of guidelines (Brownson et al., 2013; Koh et al., 2020; Shelton et al., 2020). However, the effectiveness of guideline implementation is often limited because of a lack of resources and the numerous challenges at the individual, institutional, and system levels. Dissemination and implementation (D&I) science has recently been defined as a field that "seeks to inform how evidence-based interventions can be successfully adopted, implemented, and maintained in health care delivery and community settings" (Holtrop et al., 2018). For example, organizations can use D&I science in planning and practice to address how feeding guidelines are perceived by health care providers and parents (e.g., relevance, level of difficulty, and time required). Subsequently these perceptions can be used for tailoring the message and the implementation strategies for the specific social and demographic characteristics of the target audience. Organizations can also assess the contextual factors that

may influence adoption of feeding guidelines (e.g., policies of the health care system; existing knowledge, attitudes, or practices; messages disseminated by industry) to help select implementation strategies that will most effectively fit within that organization or community (Brownson et al., 2018a,b). Finally, systematic evaluation of the actions taken to implement feeding guidelines will facilitate identification of the most effective strategies in reaching health care providers or parents (Proctor et al., 2011; Rabin et al., 2016). Ultimately the use of D&I science will reduce the time required for feeding guidelines to be adopted into policy or practice by providers, parents, and organizations (Koh et al., 2020).

There are several D&I frameworks that can be used to guide (1) the process of translating dietary guidelines into practice, (2) understanding what influences implementation outcomes (barriers and facilitators), and (3) assessing process (e.g., coverage, quality) and impact outcomes with a focus on effectiveness (Nilsen, 2015; Tabak et al., 2012; Tumilowicz et al., 2019). A comprehensive review of existing frameworks to evaluate which is best suited for the purposes of feeding guidelines was outside of the scope of this report. However, it is important to note that these frameworks generally recognize several common principles or steps that are used in D&I planning and practice (see Box 7-2).

A continuous and participatory iterative system, providing feedback on D&I plans and practices, will ensure that timely adaptations can be made to ensure successful implementation of feeding guidelines (Brown et al., 2017b). Adaptations to D&I activities, as a result of socioeconomic, cultural, demographic, and health care and food systems differences across contexts, are expected and need to be carefully documented (Chambers and Norton, 2016). Documentation of any adaptations that are made can guide future D&I efforts for feeding guidelines, taking equity principles into account (Chambers and Norton, 2016).

Thus, the committee recommends that agencies, organizations, and groups developing guideline documents related to feeding infants and young children should consider the principles of dissemination and implementation science as a means to enhance the reach and impact of the recommendations that are developed.

EVIDENCE GAPS

Based on its review of the existing feeding guidelines for infants and young children, the committee identified key evidence gaps. These gaps are part of the reason for inconsistencies in feeding recommendations, and thus research to fill these gaps is necessary to facilitate harmonization of guidance development across organizations. The areas of research highlighted

BOX 7-2
Steps for Incorporating Dissemination and Implementation (D&I) Science into the Guideline Development Process

- Identify the target audience and engage key stakeholders and partners who will be involved in the implementation of the feeding guidelines. Agreement among key stakeholders about the specifics of the feeding guidelines, including how they will be disseminated, is critical to successful implementation.
- With the help of key stakeholders and partners, tailor implementation and dissemination strategies to the target audience based on socioeconomic, cultural, health care, and food systems characteristics in order to meet the needs of the target groups, including mothers and other caregivers (Chambers and Norton, 2016; Tumilowicz et al., 2019).
- Assess the health care, social, economic, and cultural contexts in which guidelines are to be implemented. Supportive or enabling environments within key government agencies at all levels, as well as within community-based organizations, can influence the adoption of feeding guidelines through governance structures, policies, or funding sources (Tumilowicz et al., 2019).
- Use comprehensive checklists to guide the planning and selection of strategies to disseminate feeding guidelines (Gagliardi et al., 2015), including both passive strategies (e.g., websites, journal publications, e-mail distribution, and mass media campaigns) and active learning approaches that are more interactive (e.g., on-demand instructional videos embedded in websites). The use of multiple implementation strategies will be more effective than singular approaches (Prior et al., 2008).
- Share D&I plans and practices with all partners, including detailed protocols for stakeholders and programs serving end users. Protocols need to include timelines, metrics for measurements of expected outcomes, and budget allocations for effective implementation of feeding guidelines.
- Systematically evaluate ongoing D&I activities (Carroll et al., 2007; Proctor et al., 2011), including (1) whether the strategy to disseminate the feeding guidelines is being executed as intended; (2) the quality of D&I actions for feeding guidelines; (3) the extent of feeding guideline adoption and uptake; (4) outcomes, including changes in dietary knowledge, attitudes, and feeding practices; and (5) the cost and cost-effectiveness of strategies.

below are directed at addressing inconsistencies in the feeding recommendations and improving understanding of best practices for communication and dissemination of feeding guidelines. The suggestions that follow are by no means exhaustive, but rather they are the committee's reflection on the materials it reviewed within its charge. Filling these evidence gaps will require careful consideration of study design, feasibility, and resources, but it was beyond the scope of this study to delve into such issues.

Evidence Gaps Related to Inconsistencies in Feeding Recommendations

The list below represents the committee's expert judgment on key evidence gaps that arose after reviewing the topics for which there was inconsistency or lack of evidence in the guideline documents. There are other issues of interest to caregivers, stakeholders, researchers, and others, such as "baby-led weaning" (Brown et al., 2017a), that may also warrant further research, but those are not included below because the committee did not find mention of them in the recommendations abstracted from the eligible guideline documents.

- **Recommended duration of exclusive breastfeeding and the age of introduction of complementary foods:** Most recommendations stated "about" or "around" 6 months of age, but a few indicated an age range of 4–6 months and one Robert Wood Johnson Foundation-Healthy Eating Research specified "when the child is developmentally ready, which usually happens between 4 and 6 months" (Pérez-Escamilla et al., 2017). There is only one published randomized controlled trial on this issue among breastfed infants in a high-income country (Jonsdottir et al., 2012). Additional trials would be useful to understand the potential effects of introducing complementary foods at 4–5 versus at about 6 months of age.
- **Continuation of breastfeeding:** Most recommendations stated that breastfeeding should continue until at least 12 months of age, but several stated that breastfeeding may continue for 2 years and beyond. Further research on the effects (child and maternal) of breastfeeding beyond the first year of age in high-income contexts is needed, with adequate control for the baseline determinants of health (WHO, 2020).
- **Recommended duration of use of infant formula for formula-fed infants:** Most recommendations stated that infant formula should be the only breastmilk substitute until 12 months of age, but one guideline document gave an age range of 9–12 months. Similarly, some recommended delaying any cow milk until after 12 months, while others stated that cow milk could be introduced at 9–12 months or even as early as 6 months. Research would be useful to evaluate the consequences of replacing infant formula with cow milk at 9 months versus 12 months among formula-fed infants and partially breastfed infants.
- **Duration of need for iron-fortified formulas, among formula-fed infants and partially breastfed infants during the first year of life:** Recommendations differed with regard to whether iron-fortified formula is advised until 6 months, 9 months, or 12 months of

age. Research on this issue would need to take into account the relatively large amounts of iron currently added to infant formula (10–12 mg/L) in the United States, and the role of iron-fortified complementary foods. Such research would likely require the use of biomarkers specific to iron deficiency, not just hemoglobin.

- **Recommended age of introduction of potentially allergenic foods:** Recommendations were generally consistent for introduction of allergenic foods in the second 6 months of life and not delaying introduction beyond 12 months of age. The evidence for complementary feeding practices to prevent food allergy is strongest for peanuts; additional research is needed for other allergenic foods, particularly eggs (including the preparation of egg used, as in whole, egg white, egg yolk). Additional research would also be useful to establish recommendations for how to introduce allergenic foods to infants at different levels of risk for food allergies, as this more nuanced guidance has only been established for peanuts, with the peanut recommendations for infants at high risk for peanut allergy being based on high-quality trials (du Toit et al., 2015; Perkin et al., 2016). More evidence is needed for timing of peanut introduction for infants at moderate or low risk for the development of peanut allergy.
- **Vitamin D supplementation:** Most recommendations advised vitamin D supplementation for breastfed infants only, but some recommended it for all infants including nonbreastfed infants. There are also unresolved questions regarding the extent to which adequate vitamin D status of breastfed infants can be maintained via maternal high-dose vitamin D supplements during lactation, and if so, the risks and benefits of such an approach. Clarifying which infants do or do not need vitamin D supplements would focus the recommendations related to vitamin D and tailor them for populations with the highest need.
- **Iron supplements for breastfed infants:** The most recent recommendations did not advise routine use of iron supplements for exclusively breastfed infants, but they mentioned that some infants may be at risk for iron deficiency prior to 6 months (after which iron-rich complementary foods can meet iron needs). Research is needed on strategies to identify and appropriately treat such infants, such as those born with low iron stores (e.g., due to lower birth weight, shorter duration of gestation, immediate clamping of the umbilical cord, and maternal iron deficiency during pregnancy).
- **Use of supplements or fortified products for vegetarian or vegan infants and young children:** Most recommendations emphasized the need for extra attention to certain nutrients in the case of veg-

etarian or vegan diets, but only some of them explicitly mentioned a need for fortified products or nutrient supplements. Research is needed on how to achieve nutritional adequacy for infants and young children who are fed vegetarian or vegan diets.

- **Consumption of iodine from foods:** There was consistency in recommending that foods for infants and young children be prepared without adding salt, but some guideline documents pointed to the need for adequate iodine intake and recommended using iodized salt, if salt was to be used in the food provided. Research is needed on iodine requirements for children under 2 years of age, and how to meet those requirements.

Evidence Gaps Related to Communication and Dissemination of Feeding Guidelines

The evidence gaps listed below were identified through the committee's review of communication and dissemination strategies provided in existing feeding guideline documents.

- Identify the best ways to communicate to parents and other caregivers, health care providers, early care and education providers, program administrators, and policy makers regarding levels of evidence to support different recommendations for feeding children under 2 years of age, and implications for implementation.
- Design and evaluate protocols for communication and dissemination strategies specific to infant and young child feeding and tailored to the specific needs of diverse audiences, including low-resource and low-literacy populations, historically marginalized groups, and first-time parents. Include evaluation of the role of community health workers and peer counselors to facilitate effective dissemination of feeding guidelines.
- Evaluate the effect of telehealth use by health professionals, community health workers, and peer counselors to facilitate effective dissemination of feeding guidelines among socioeconomically vulnerable, rural, and other hard-to-reach populations.
- Evaluate the effect of different pathways for dissemination of guidelines via applications and social media. This could include development and validation of social network analysis methods for identifying key influencers and optimizing dissemination approaches.
- Evaluate effectiveness of dissemination strategies, based on D&I science, that target diverse audiences including parents and other caregivers, health care providers, early care and education provid-

ers, and policy makers. Include metrics of effectiveness for each step of the dissemination process, including effects on knowledge, attitudes, and practices as well as cost-effectiveness, taking racial, ethnic, and other sociobehavioral factors into account.

CLOSING REMARKS

In spite of all of the differences in the ways that guideline documents were developed, it is encouraging that there was consistency in many of the feeding recommendations across a variety of authoritative organizations. Moving forward, however, it is important to encourage more rigorous, systematic, and ideally harmonized methods for developing recommendations for feeding infants and children from birth to 24 months of age, and for disseminating and implementing the recommendations using the principles of D&I science.

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Appendix A

Excluded Guideline Documents

Based on eligibility criteria set forth by the committee, the guideline documents listed in this appendix were excluded through screening. The documents are categorized by the rationale for exclusion.

Peanut allergy–related recommendations predating the release of the LEAP trial results (*n* = 1)

Chan, E. S., C. Cummings, Canadian Paediatric Society, and Community Paediatrics Committee and Allergy Section. 2013. Dietary exposures and allergy prevention in high-risk infants: A joint statement with the Canadian society of Allergy and Clinical Immunology. *Paediatrics and Child Health* 18(10):545–554.

Documents that provide guidance related to clinical management of lactation (*n* = 2)

Holmes, A. V., A. Y. McLeod, and M. Bunik. 2013. ABM clinical protocol #5: Peripartum breastfeeding management for the healthy mother and infant at term, revision 2013. *Breastfeeding Medicine* 8(6):469–473.

Kellams, A., C. Harrel, S. Omage, C. Gregory, and C. Rosen-Carole. 2017. ABM clinical protocol #3: Supplementary feedings in the healthy term breastfed neonate, revised 2017. *Breastfeeding Medicine* 12:188–198.

Position statements that only recommend methods for preparing and storing foods, including breast milk or formula (*n* = 5)

AAP (American Academy of Pediatrics), Committee on Infectious Diseases, and Committee on Nutrition. 2014. Consumption of raw or unpasteurized milk and milk products by pregnant women and children. *Pediatrics* 133(1):175–179.

Eglash, A., L. Simon, and Academy of Breastfeeding Medicine. 2017. ABM clinical protocol #8: Human milk storage information for home use for full-term infants, revised 2017. *Breastfeeding Medicine* 12(7):390–395.

FSAI (Food Safety Authority of Ireland). 2015. *FSAI scientific committee recommendations of sodium content of bottled water suitable for infant feeding.* Corrigendum: Section 4.8.3 scientific recommendations for a national infant feeding policy, 2nd edition. Dublin, Ireland: FSAI.

Ministry of Health and New Zealand Government. 2017. *Feeding your baby infant formula: How to prepare infant formula safely.* https://www.healthed.govt.nz/system/files/resource-files/HE1306_Feeding%20your%20baby%20infant%20formula_0.pdf (accessed February 20, 2020).

WHO/FAO (World Health Organization/Food and Agriculture Organization of the United Nations). 2007. *Safe preparation, storage and handling of powdered infant formula. Guidelines.* Geneva, Switzerland: WHO.

Clinical treatment guideline for a specific disease or condition (*n* = 3)

Leung, A. K. C., V. Marchand, R. S. Sauve, Canadian Paediatric Society, and Nutrition and Gastroenterology Committee. 2012. The "picky eater": The toddler or preschooler who does not eat. *Paediatrics and Child Health* 17(8):455–460.

Reece-Stremtan, S., and K. A. Marinelli. 2015. ABM clinical protocol #21: Guidelines for breastfeeding and substance use or substance use disorder, revised 2015. *Breastfeeding Medicine* 10(3):135–141.

Thomas, D. W., and F. R. Greer. 2010. Probiotics and prebiotics in pediatrics. *Pediatrics* 126(6):1217–1231.

Documents that have the primary purpose of being a communication or dissemination tool (e.g., training manual, pamphlets) (*n* = 37)

AAP, APHA (American Public Health Association), and NRCHS (National Resource Center for Health and Safety in Child Care and Early Education). 2019. Nutrition and food service. In *Caring for our children: National health and safety performance standards; guidelines for early care and education programs*. Itasca, IL: AAP.

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Appendix B

Abstracted Recommendations

Recommendations were abstracted from each of the guideline documents and resources that were found eligible after screening. Recommendations were organized into 26 topic areas, presented in the tables that follow.[1] Within each table, recommendations are presented chronologically, beginning with the most recent. Consistency of recommendations on a given topic is summarized in Chapters 4 and 5. Citations included in the tables are found in the references list.

- TABLE B-1 Recommendations Related to Exclusive Breastfeeding
- TABLE B-2 Recommendations Related to Continuation of Breastfeeding
- TABLE B-3 Recommendations Related to Supplementary Formula Feeding of Breastfed Infants
- TABLE B-4 Recommendations Related to Duration of Infant Formula Use
- TABLE B-5 Recommendations Related to Type of Infant Formula
- TABLE B-6 Recommendations Related to Toddler Milks and Follow-On Formulas
- TABLE B-7 Recommendations Related to Milk and Milk-Based Products
- TABLE B-8 Recommendations Related to Fluids: Water, Juice, Sugar-Sweetened Beverages, and Other Nonmilk Beverages

[1] The tables in this appendix contain recommendations directly from the provided citation. Recommendations have been edited for style, which did not affect their content.

The tables begin on the next page.

TABLE B-1 Recommendations Related to Exclusive Breastfeeding

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
CPS	Unger et al., 2019	Exclusive breastfeeding is recommended for the first 6 months.	Narrative review
RCPCH	RCPCH, 2019	Key messages for health professionals: Mothers should be supported to breastfeed their healthy term infant exclusively for up to 6 months.	Narrative review
SACN	SACN, 2018	The totality of the evidence reviewed for this report supports current guidance to breastfeed exclusively for around the first 6 months of an infant's life and to continue breastfeeding for at least the first year of life. Each makes an important contribution to infant and maternal health.	Narrative review
SACN; COT	SACN and COT, 2018	The government should continue to recommend exclusive breastfeeding for around the first 6 months of life.	WHO report[a]
ESPGHAN	Fewtrell et al., 2017	Exclusive or full breastfeeding should be promoted for at least 4 months (17 weeks, beginning of the 5th month of life), and exclusive or predominant breastfeeding for approximately 6 months is considered a desirable goal.[b]	Systematic literature search
RWJF-HER	Pérez-Escamilla et al., 2017	For the first 6 months (or until the introduction of solid food), most babies only need breast milk (or formula). Breast milk provides nearly all the nutrients needed for optimal growth and strengthens the infant's immune system. The composition of breast milk changes as your baby grows to match her or his individual nutritional needs. Breastfeeding is recommended to continue until your baby is at least 1 year old.	Narrative review

Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2015	Recommend exclusive breastfeeding for the first 6 months.[c]	Narrative review
AAFP	AAFP, 2014	Almost all babies should be breastfed or receive human milk exclusively for approximately 6 months.	A Cochrane review[d]
CPS	Grueger et al., 2013 (reaffirmed 2018)	Support exclusive breastfeeding, with vitamin D supplementation, for the first 6 months of life.	Narrative review
AAP	AAP Section on Breastfeeding, 2012	Exclusive breastfeeding for about 6 months. Breastfeeding preferred; alternatively, expressed mother's milk or donor milk.[e]	Narrative review; Could not be mapped[f]
New Zealand Ministry of Health	Ministry of Health, 2012[g]	Give only breast milk until the infant is ready for and needs extra food; this will be at around 6 months of age.	Narrative review
NHMRC (Australian government)	NHMRC, 2012[h]	Encourage exclusive breastfeeding for around 6 months.	Systematic review[i,j]
		Encourage, support, and promote exclusive breastfeeding to around 6 months of age.	Previous Australian guidelines
New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	Encourage mothers to exclusively breastfeed infants until around 6 months of age and to continue to breastfeed until at least 1 year of age, or beyond.	2008 New Zealand Ministry of Health's *Food and Nutrition Guidelines for Healthy Infants and Toddlers*[k]
AHA	Gidding et al., 2005	Maintain breastfeeding as the exclusive source of nutrition for the first 4–6 months of life.	Narrative review
PAHO/WHO	PAHO/WHO, 2003	Practice exclusive breastfeeding from birth to 6 months of age, and introduce complementary foods at 6 months of age (180 days) while continuing to breastfeed.[l]	Technical consultations and documents

continued

TABLE B-1 Continued

NOTE: AAFP = American Academy of Family Physicians; AAP = American Academy of Pediatrics; AHA = American Heart Association; COT = Committee on Toxicity of Chemicals in Food, Consumer Products, and the Environment; CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; HC = Health Canada; NHMRC = National Health and Medical Research Council; PAHO = Pan American Health Organization; RCPCH = Royal College of Paediatrics and Child Health; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition; WHO = World Health Organization.

[a] WHO, 2001.

[b] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[c] © All rights reserved. *Nutrition for healthy term infants: Recommendations from birth to six months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[d] Kramer and Kakuma, 2012.

[e] This recommendation contained additional guidance unrelated to exclusive breastfeeding that has been omitted from this table.

[f] The first sentence mapped to a narrative review; the second sentence could not be mapped to its evidence.

[g] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[h] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[i] Although it is not stated in this excerpt, this recommendation pertains to food allergies.

[j] Using the NHMRC system, the strength-of-evidence ratings related to this recommendation were as follows: Grade C (for breastfeeding and asthma and atopy) and Grade D (introduction of solid foods and allergy). Grade C (suggestive association) indicates that the body of evidence provides some support for the recommendations but care should be taken in its application. Grade D indicates that the body of evidence is weak and any recommendation must be applied with caution.

[k] Ministry of Health, 2008.

[l] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Duration of Exclusive Breastfeeding and Age of Introduction of Complementary Foods, p. 10, Copyright (2003).

TABLE B-2 Recommendations Related to Continuation of Breastfeeding

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
CPS	Abrams et al., 2019	Breastfeeding should be protected, promoted, and supported for up to 2 years and beyond.[a]	Narrative review
RCPCH	RCPCH, 2019	Key messages for health professionals: Mothers should be supported to continue breastfeeding for as long as they wish; in countries such as the United Kingdom, evidence is lacking to recommend any particular duration of breastfeeding.	Narrative review
		Key messages for health professionals: We recommend that mothers should be encouraged to breastfeed beyond 6 months, alongside giving solid food.	Narrative review
ESPGHAN	Hojsak et al., 2018	Breastfeeding should be recommended as part of a healthy diet after the first year of life if mutually desired by mother and child.	Could not be mapped
SACN	SACN, 2018	The totality of the evidence reviewed for this report supports current guidance to breastfeed exclusively for around the first 6 months of an infant's life and to continue breastfeeding for at least the first year of life. Each makes an important contribution to infant and maternal health.	Narrative review
AAPD	AAPD, 2017	AAPD supports breastfeeding of infants prior to 12 months of age to ensure the best possible health and developmental and psychosocial outcomes for infants.	An AAP statement[b]
ESPGHAN	Fewtrell et al., 2017	Continued breastfeeding is recommended along with the introduction of complementary foods.[c]	Systematic literature search
RWJF-HER	Pérez-Escamilla et al., 2017	It is fine to continue breastfeeding beyond 1 year if desired by parent and child.	Narrative review

continued

TABLE B-2 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
AAP; AAPD	AAPD, 2016	To decrease the risk of developing early childhood caries, AAPD encourages professional and at-home preventive measures that include avoiding frequent consumption of liquids and/or solid foods containing sugar, in particular, and ad libitum breastfeeding after the first primary tooth begins to erupt and other dietary carbohydrates are introduced.[d]	Narrative review
AAFP	AAFP, 2014	Breastfeeding with appropriate complementary foods, including iron-rich foods, should continue through at least the first year.	An AAP statement[b]
		Health outcomes for mothers and babies are best when breastfeeding continues for at least 2 years. Breastfeeding should continue as long as mutually desired by mother and child.	*Innocenti Declaration*[e]
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Encourage continued breastfeeding, or offering 500 mL per day of homogenized (3.25% milk fat) cow milk.[f,g]	Narrative review; *2007 Eating Well with Canada's Food Guide*[b]
		Support breastfeeding for up to 2 years or beyond, as long as mother and child want to continue.[f]	Narrative review
AAP	AAP Section on Breastfeeding, 2012	Exclusive breastfeeding for about 6 months, to continue for at least the first year and beyond for as long as mutually desired by mother and child.[d]	Narrative review; Could not be mapped[i]
NHMRC (Australian government)	NHMRC, 2012[j]	Continue breastfeeding while introducing appropriate solid foods until 12 months of age and beyond, for as long as the mother and child desire.	Other national and international statements on infant feeding
		While breastfeeding is recommended for the first 6–12 months and beyond, any breastfeeding is beneficial to the infant and mother.	Other national and international statements on infant feeding

CPS	Grueger et al., 2013 (reaffirmed 2018)	Encourage continued breastfeeding for up to 2 years and beyond while providing appropriate nutritional guidance.	Narrative review
New Zealand Ministry of Health	Ministry of Health, 2012[k]	Breastfeed until at least 1 year of age, or beyond.	Narrative review
New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	Encourage mothers to exclusively breastfeed infants until around 6 months of age, and to continue to breastfeed until at least 1 year of age, or beyond.	2008 New Zealand Ministry of Health's *Food and Nutrition Guidelines for Healthy Infants and Toddlers*[l]
NICE	NICE, 2008	Child health promotion: Health visitors and the CHPP team should support mothers to continue breastfeeding for as long as they choose.	Rapid review,[m] UK Department of Health report[n]
AHA	Gidding et al., 2005	Choose breastfeeding for first nutrition; try to maintain for 12 months.	Narrative review
PAHO/WHO	PAHO/WHO, 2003	Continue frequent, on-demand breastfeeding until 2 years of age or beyond.[o]	Technical consultations and documents

NOTE: AAFP = American Academy of Family Physicians; AAP = American Academy of Pediatrics; AAPD = American Academy of Pediatric Dentistry; AHA = American Heart Association; CHPP = Child Health Promotion Programme; CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; HC = Health Canada; NHMRC = National Health and Medical Research Council; NICE = National Institute for Health and Care Excellence; PAHO = Pan American Health Organization; RCPCH = Royal College of Paediatrics and Child Health; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition; WHO = World Health Organization.

[a] Although not stated in this excerpt, this recommendation is intended for infants considered to be at high risk for allergic disease, having either a personal history of atopy or a first-degree relative with atopy.

[b] AAP Section on Breastfeeding, 2012.

[c] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[d] This recommendation contained additional guidance unrelated to continuation of breastfeeding that has been omitted from this table.

continued

TABLE B-2 Continued

[e] UNICEF, 1990. This is the reference for the first sentence of the recommendation. The second sentence did not contain a citation.

[f] © All rights reserved. *Nutrition for healthy term infants: Recommendations from six to 24 months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[g] Recommendation is applicable to older infants (6–12 months) and young children (12–24 months).

[h] Health Canada, 2007.

[i] The first half of the statement mapped to a narrative review, whereas the second half could not be mapped to its evidence.

[j] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[k] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[l] Ministry of Health, 2008.

[m] Each recommendation was associated with multiple evidence statements. Each evidence statement was taken from a review of effectiveness. Some of the evidence statements give a strength-of-evidence rating (++, +, –). There is no overall statement on the strength of the evidence for each recommendation.

[n] Department of Health, 1994.

[o] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Maintenance of Breastfeeding, p. 12, Copyright (2003).

TABLE B-3 Recommendations Related to Supplementary Formula Feeding of Breastfed Infants

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
RCPCH	RCPCH, 2019	Key messages for health professionals: Mothers should be advised that the use of infant formula "supplements" or combined breast and formula feeding may make it more difficult to establish exclusive breastfeeding.	Narrative review
AAFP	AAFP, 2014	Formula supplementation of breastfed babies should occur only when medically indicated. Family physicians should not undermine breastfeeding by providing formula samples or coupons to breastfeeding mothers.	WHO/UNICEF document;[a] a primary research article[b]
NHMRC (Australian government)	NHMRC, 2012[c]	If supplementary feeding is needed in hospital, it should only be given for specific medical indications and with the mother's agreement.	Systematic review[d]
New Zealand Ministry of Health	Ministry of Health, 2012[e]	Strongly discourage the supplementing of breastfeeding with formula, water, herbal teas, milks, or any other liquids. A breastfeeding mother who is considering supplementing breast milk with infant formula to settle an infant should be given advice on settling the infant in other ways. This should include advice on increasing the mother's supply of breast milk or introducing appropriate complementary foods if the infant is developmentally ready.	Narrative review

NOTE: AAFP = American Academy of Family Physicians; NHMRC = National Health and Medical Research Council; RCPCH = Royal College of Paediatrics and Child Health; UNICEF = United Nations Children's Fund; WHO = World Health Organization.

[a] WHO/UNICEF, 2009. Citation for the first sentence of the recommendation.

[b] Howard et al., 2000. Citation for the second sentence of the recommendation.

[c] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[d] Using the NHMRC system, the strength of evidence supporting this recommendation was Grade C (impact of prelacteal feeds on breastfeeding outcomes). Grade C (suggestive association) indicates that the body of evidence provides some support for the recommendations but care should be taken in its application.

[e] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

TABLE B-4 Recommendations Related to Duration of Infant Formula Use

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
CPS	Unger et al., 2019	For well infants, formula feeding is not required beyond 12 months of age, when whole cow milk can be introduced. Formulas designed for toddlers beyond 12 months are not necessary.	Narrative review
RWJF-HER	Pérez-Escamilla et al., 2017	Infant formula (based on either cow or goat milk) is the only suitable alternative to breast milk for babies who are under 12 months old.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	For an older infant or young child who is not breastfed or receiving breast milk: Advise that, for most healthy young children, there is no indication for the use of commercial formulas beyond one year of age.[a]	Narrative review
		For an older infant or young child who is not breastfed or receiving breast milk: Recommend commercial infant formula until 9–12 months of age.[a]	Could not be mapped
New Zealand Ministry of Health	Ministry of Health, 2012[b]	If the infant is not breastfed, then an infant formula should be used until the infant is 1 year of age. For vegan infants who are not breastfed or are partially breastfed, the use of a commercial soy-based infant formula during the first 2 years of life is recommended.	Narrative review
		If the infant is not breastfed, then use an infant formula as the milk source until the infant is 1 year of age.	Narrative review
NHMRC (Australian government)	NHMRC, 2012[c]	Use cow milk–based formulas until 12 months of age. (Note: All infant formulas available in Australia are iron fortified.)	Systematic review

NOTE: CPS = Canadian Paediatric Society; HC = Health Canada; NHMRC = National Health and Medical Research Council; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research

[a] © All rights reserved. *Nutrition for healthy term infants: Recommendations from six to 24 months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[b] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[c] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

TABLE B-5 Recommendations Related to Type of Infant Formula

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
AAP	Greer et al., 2019	There is lack of evidence that partially or extensively hydrolyzed formula prevents atopic disease in infants and children, even in those at high risk for allergic disease.	Narrative review
CPS	Unger et al., 2019	If normal birth weight infants are not breastfed, they should receive formula containing 6.5 mg/L to 13 mg/L of iron (which is the typical concentration in standard cow milk–based formulas in Canada) for the first 9–12 months.	Narrative review
RWJF-HER	Pérez-Escamilla et al., 2017	Ask your child's doctor if you are considering using hydrolyzed or "hypoallergenic" infant formulas, as these formulas have not been found to help prevent food allergies in infants.	Adapted from American Academy of Allergy, Asthma & Immunology (2015)[a] and Australasian Society of Clinical Immunology and Allergy (2016)[b]
		Infant formula (based on either cow or goat milk) is the only suitable alternative to breast milk for babies who are under 12 months old. The use of soya-based formula should only be on medical advice, and the possible health effects of soya-based formula should be kept under review.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2015	Discourage the use of homemade, evaporated milk formula. Cow milk, goat milk, soy beverage, rice beverage, or any other beverages should not be given to young infants.[c]	Narrative review
		Recommend cow milk–based, commercial infant formula for an infant who is not exclusively fed breast milk. Soy-based infant formula is indicated only for those infants who have galactosemia or who cannot consume dairy-based products for cultural or religious reasons.[c]	Narrative review

continued

TABLE B-5 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
NHMRC (Australian government)	NHMRC, 2012[d]	Use cow milk–based formulas until 12 months of age. (Note: all infant formulas available in Australia are iron fortified.) Special formulas such as extensively hydrolyzed or soy milk–based formulas may be used under medical supervision for infants who cannot take cow milk–based products or because of specific medical, cultural, or religious reasons. (Note: Goat milk–based formula is not a suitable alternative for infants with allergies to cow milk–based formulas.)	Systematic review
		Specialty formulas are indicated only for infants with confirmed pathology; health care professionals should advise parents accordingly.	2009 WHO report[e]
New Zealand Ministry of Health	Ministry of Health, 2012[f]	If the infant is not breastfed, then an infant formula should be used until the infant is 1 year of age. For vegan infants who are not breastfed or are partially breastfed, the use of a commercial soy-based infant formula during the first 2 years of life is recommended.	Narrative review
		Use cow milk formula. If concerns arise, consult a health practitioner rather than switch to an alternative.	Narrative review
AAP	Bhatia et al., 2008 (reaffirmed 2016)	In term infants, although isolated soy protein–based formulas may be used to provide nutrition for normal growth and development, there are few indications for their use in place of cow milk–based formula. These indications include (a) for infants with galactosemia and hereditary lactase deficiency (rare), and (b) in situations in which a vegetarian diet is preferred.	Narrative review[g]
		The routine use of isolated soy protein–based formula has no proven value in the prevention of atopic disease in healthy or high-risk infants.	Narrative review

	The routine use of isolated soy protein–based formula has no proven value in the prevention or management of infantile colic or fussiness.	Narrative review
	Isolated soy protein–based formula has no advantage over cow milk protein–based formula as a supplement for the breastfed infant, unless the infant has one of the indications noted previously—(a) for infants with galactosemia and hereditary lactase deficiency (rare), and (b) in situations in which a vegetarian diet is preferred).	Narrative review

NOTE: AAFP = American Academy of Family Physicians; AAP = American Academy of Pediatrics; CPS = Canadian Paediatric Society; HC = Health Canada; NHMRC = National Health and Medical Research Council; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; WHO = World Health Organization.

[a] AAAAI, 2015.

[b] ASCIA, 2016.

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[d] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[e] WHO/UNICEF, 2009.

[f] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[g] Guideline document included references related to soy protein–based formulas and infant growth and development. No references were provided for the portion of the recommendation related to galactosemia or vegetarian diets.

TABLE B-6 Recommendations Related to Toddler Milks and Follow-On Formulas

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
CPS	Unger et al., 2019	For well infants, formula feeding is not required beyond 12 months of age, when whole cow milk can be introduced. Formulas designed for toddlers beyond 12 months are not necessary.	Narrative review
RWJF-HER	Lott et al., 2019[a]	0–12 months: Avoid supplementation with transition or weaning formulas; nutrient needs should be met primarily through human milk and/or infant formula.	Narrative review
		1–5 years (12–60 months): Toddler milk is not recommended; nutrient needs should be met primarily through nutritionally adequate dietary patterns.	Narrative review
ESPGHAN	Hojsak et al., 2018	Based on available evidence there is no necessity for the routine use of [young child formula] in children from 1 to 3 years of life, but they can be used as part of a strategy to increase the intake of iron, vitamin D, and n-3 PUFAs and decrease the intake of protein compared to unfortified cow milk. Follow-on formula can be used for the same purpose.	Systematic literature review
	Domellöf et al., 2014	Follow-on formulas should be iron fortified; however, there is not enough evidence to determine the optimal iron concentration in follow-on formula.[b]	Narrative review
NHMRC (Australian government)	NHMRC, 2012[c]	Toddler milks and special and/or supplementary foods for toddlers are not required for healthy children.	Could not be mapped
New Zealand Ministry of Health	Ministry of Health, 2012[d]	Whole cow milk or a suitable alternative is recommended for toddlers. Fortified cow milk, such as toddler milk, is generally not necessary.	Narrative review

NOTE: CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; NHMRC = National Health and Medical Research Council; PUFA = polyunsaturated fatty acid; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research.

[a] Lott et al. (2019) was an expert panel report with representation from the Academy of Nutrition and Dietetics, the American Academy of Pediatric Dentistry, the American Academy of Pediatrics, and the American Heart Association.

[b] Recommendation noted as being valid for Europe and other regions with a low general prevalence of iron deficiency anemia.

[c] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[d] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

TABLE B-7 Recommendations Related to Milk and Milk-Based Products[a]

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
Infants 0–12 Months of Age			
CPS	Unger et al., 2019	For well infants, formula feeding is not required beyond 12 months of age, when whole cow milk can be introduced.	Narrative review
RWJF-HER	Lott et al., 2019[b]	0–12 months: Children under 12 months should not consume milk.	DGA, AAP, and a prior RWJF-HER expert panel on infant and toddler feeding guidelines
		0–12 months: Do not consume milk (flavored or plain).	Federal CACFP nutrition standards, and the National Academies recommendation that only unflavored milk be permitted in the WIC food package
SACN	SACN, 2018	Unmodified cow milk should not be given as a main drink to infants under 12 months of age.	Narrative review
AAP	Heyman et al., 2017	Families should be educated that, to satisfy fluid requirements, human milk and/or infant formula is sufficient for infants and low-fat/nonfat milk and water are sufficient for older children.	Narrative review
ESPGHAN	Fewtrell et al., 2017	Cow milk is a poor iron source and provides excess protein, fat, and energy when used in large amounts. It should not be used as the main drink before 12 months of age, although small volumes may be added to complementary foods.[c]	Systematic literature search
RWJF-HER	Pérez-Escamilla et al., 2017	Cow milk should *not* be offered before the child turns 1 year old because it may cause intestinal bleeding.	Narrative review

continued

TABLE B-7 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
ESPGHAN	Domellöf et al., 2014	Unmodified cow milk should not be fed as the main milk drink to infants before the age of 12 months and intake should be limited to < 500 mL daily in toddlers.[d]	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Encourage continued breastfeeding, or offering 500 mL per day of homogenized (3.25% milk fat) cow milk.[e]	Narrative review; 2007 *Eating Well with Canada's Food Guide*[f]
		For an older infant or young child who is not breastfed or receiving breast milk: Advise pasteurized homogenized (3.25% milk fat) cow milk be introduced at 9–12 months of age. Skim milk is not appropriate in the first 2 years.[e]	Narrative review
		If parents and caregivers are introducing cow milk, advise them to delay until 9–12 months of age. Recommend limiting cow milk intake to no more than 750 mL per day.[e]	Narrative review
NHMRC (Australian government)	NHMRC, 2012[g]	Any unmodified milk from nonhuman species, for example, cow, goat, and sheep milk is not suitable for human infants, and should not be given as a main drink before 12 months.	Systematic review[h]
		Cow milk should not be given as the main drink to infants under 12 months; however, small amounts may be used in the preparation of solid foods.	Systematic review[i]
		Foods can be introduced in any order provided iron-rich nutritious foods are included and the texture is suitable for the infant's stage of development. Cow milk products including full-fat yogurt, cheese and custard may be given, but not cow milk as a main drink before 12 months.	Systematic review; narrative review[j]
		Low-fat and reduced-fat milks (skim milk and milk with 2–2.5% fat) are not recommended in the first 2 years of life.	Could not be mapped
		Pasteurized full cream milk may be introduced to a child's diet as a drink at around 12 months of age and be continued throughout the second year of life, and beyond. It is an excellent source of protein, calcium, and other nutrients. Do not use unpasteurized cow or goat milk.	Systematic review; narrative review; 2003 WHO European region report[k]

New Zealand Ministry of Health	Ministry of Health, 2012[l]	After 1 year, cow milk may be introduced.	Narrative review
AAP	Baker et al., 2010	Whole milk should not be used before 12 completed months of age.	Narrative review
New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	Discuss healthy eating and remind parents to choose nutritious and tooth-friendly snacks.… Cow milk should not be given before a child is 12 months old. Whole milk is recommended for children aged 1 to 2 years. Reduced-fat and low-fat milks can be introduced from 2 years of age.[m]	Could not be mapped
WHO	WHO, 2005	Feed a variety of foods to ensure that nutrient needs are met. If adequate amounts of other animal-source foods are consumed regularly, the amount of milk needed is ~200–400 mL/day; otherwise, the amount of milk needed is ~300–500 mL/day. Acceptable milk sources include full-cream animal milk (cow, goat, buffalo, sheep, camel), ultrahigh temperature (UHT) milk, reconstituted evaporated (but not condensed) milk, fermented milk or yogurt, and expressed breast milk (heat treated if the mother is HIV positive).[n]	A background document and narrative review
Children 12–24 Months of Age			
CPS	Unger et al., 2019	For well infants, formula feeding is not required beyond 12 months of age, when whole cow milk can be introduced. Formulas designed for toddlers beyond 12 months are not necessary.	Narrative review

continued

TABLE B-7 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
RWJF-HER	Lott et al., 2019[b]	12–24 months: At 12 months of age, plain, pasteurized whole milk may be introduced; 2 to 3 cups per day (16–24 oz) whole milk is recommended until 2 years of age.* *For 12- to 24-month-olds, individual needs will depend on the amount of solid food consumed. As toddlers transition from getting most of their daily calories and nutrient needs from liquids (e.g., breast milk, formula, cow milk) to eating more solid foods, less milk is needed to meet daily calcium and caloric needs. However, milk remains an important dietary source of protein, calcium, and vitamin D for young children during this time.	DGA, AAP, and a prior RWJF-HER expert panel on infant and toddler feeding guidelines
		12–24 months: Reduced-fat (2%) or low-fat (1%) milk may be considered, in consultation with a pediatrician, especially in the presence of excessive weight gain or family history of obesity, dyslipidemia, or other cardiovascular diseases.	DGA, AAP, and a prior RWJF-HER expert panel on infant and toddler feeding guidelines
		1–5 years (12–60 months): Consume only plain, pasteurized milk; flavored milk is not recommended.	Federal CACFP nutrition standards, and the National Academies recommendation that only unflavored milk be permitted in the WIC food package
AAP	Heyman et al., 2017	Families should be educated that, to satisfy fluid requirements, human milk and/or infant formula is sufficient for infants and low-fat/nonfat milk and water are sufficient for older children.	Narrative review

RWJF-HER	Pérez-Escamilla et al., 2017	At each meal, or as part of a snack, offer your toddler 1/2 cup (4 oz) of milk.	Narrative review
		Give your toddler cow milk in a cup instead of a bottle.	Narrative review
		The American Academy of Pediatrics recommends giving pasteurized whole cow milk to 1- to 2-year-olds. However, your health care provider may recommend pasteurized reduced-fat milk (2%) instead if there is a family history of obesity or heart problems.	Narrative review
		Too much milk may decrease your toddler's appetite for other food needed to meet nutritional needs. Keep your child's total milk consumption to no more than 2 cups (16 fluid oz) per day while offering a variety of healthy food.	Narrative review
		You can offer 1/2 to 3/4 cup of yogurt in place of milk during meal or snack times, but serve only plain yogurt or yogurt without excessive total sugars (no more than 23 g per 6 oz).	Narrative review
ESPGHAN	Domellöf et al., 2014	Unmodified cow milk should not be fed as the main milk drink to infants before the age of 12 months, and intake should be limited to < 500 mL daily in toddlers.[d]	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Encourage continued breastfeeding, or offering 500 mL per day of homogenized (3.25% milk fat) cow milk.[e]	Narrative review; 2007 *Eating Well with Canada's Food Guide*[f]
		For an older infant or young child who is not breastfed or receiving breast milk: Advise pasteurized homogenized (3.25% milk fat) cow milk be introduced at 9–12 months of age. Skim milk is not appropriate in the first 2 years.[e]	Narrative review
		If parents and caregivers are introducing cow milk, advise them to delay until 9–12 months of age. Recommend limiting cow milk intake to no more than 750 mL per day.[e]	Narrative review

continued

TABLE B-7 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
NHMRC (Australian government)	NHMRC, 2012[g]	Low-fat and reduced-fat milks (skim milk and milk with 2–2.5% fat) are not recommended in the first 2 years of life.	Could not be mapped
		Pasteurized full cream milk may be introduced to a child's diet as a drink at around 12 months of age and be continued throughout the second year of life, and beyond. It is an excellent source of protein, calcium, and other nutrients. Do not use unpasteurized cow or goat milk.	Systematic review; narrative review; WHO European region report[k]
New Zealand Ministry of Health	Ministry of Health, 2012[l]	If the infant is not breastfed, then use an infant formula as the milk source until the infant is 1 year of age. After 1 year, cow milk may be introduced.	Narrative review
		It is recommended that toddlers consume no more than 500 mL of cow milk each day.	Narrative review
		Whole cow milk or a suitable alternative is recommended for toddlers. Fortified cow milk, such as toddler milk, is generally not necessary.	Narrative review
AAP	Baker et al., 2010	Whole milk should not be used before 12 completed months of age.	Narrative review
New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	Discuss healthy eating and remind parents to choose nutritious and tooth-friendly snacks.… Cow milk should not be given before a child is 12 months old. Whole milk is recommended for children aged 1 to 2 years. Reduced-fat and low-fat milks can be introduced from 2 years of age.[m]	Could not be mapped
		Emphasize water/full-fat cow milk as drinks of choice.	Could not be mapped
WHO	WHO, 2005	Feed a variety of foods to ensure that nutrient needs are met. If adequate amounts of other animal-source foods are consumed regularly, the amount of milk needed is ~200–400 mL/day; otherwise, the amount of milk needed is ~300–500 mL/day. Acceptable milk sources include full-cream animal milk (cow, goat, buffalo, sheep, camel), ultrahigh temperature (UHT) milk, reconstituted evaporated (but not condensed) milk, fermented milk or yogurt, and expressed breast milk (heat treated if the mother is HIV positive).[n]	A background document and narrative review

Flavored Milk			
RWJF-HER	Lott et al., 2019[b]	0–12 months: Do not consume milk (flavored or plain).	Federal CACFP nutrition standards, and the National Academies recommendation that only unflavored milk be permitted in the WIC food package
		12–24 months: At 12 months of age, plain, pasteurized whole milk may be introduced; 2 to 3 cups per day (16–24 oz) whole milk is recommended until 2 years of age.* *For 12- to 24-month-olds, individual needs will depend on the amount of solid food consumed. As toddlers transition from getting most of their daily calories and nutrient needs from liquids (e.g., breast milk, formula, cow milk) to eating more solid foods, less milk is needed to meet daily calcium and caloric needs. However, milk remains an important dietary source of protein, calcium, and vitamin D for young children during this time.	DGA, AAP, and a prior RWJF-HER expert panel on infant and toddler feeding guidelines
		1–5 years (12–60 months): Consume only plain, pasteurized milk; flavored milk is not recommended.	Federal CACFP nutrition standards, and the National Academies recommendation that only unflavored milk be permitted in the WIC food package
RWJF-HER	Pérez-Escamilla et al., 2017	Offer cow milk with no added sugars (e.g., no flavored milks).	Narrative review

continued

TABLE B-7 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
ESPGHAN	Fidler Mis et al., 2017	Smoothies and sweetened milk drinks/products (i.e., milk products containing a higher concentration of sugars than unprocessed human, cow, or goat milk, such as chocolate milks, condensed milks, fruit yogurts) are not specifically mentioned in the WHO definition; however, they are an important source of free sugars and their intake should be limited.[o]	Systematic literature search
		Sugar-containing beverages and foods (SSBs, fruit juices, fruit-based smoothies, and sweetened milk drinks/products) should be replaced by water or, in the latter case, with unsweetened milk drinks/products with lactose up to the amount naturally present in milk and unsweetened milk products.[o]	Systematic literature search

NOTE: AAP = American Academy of Pediatrics; CACFP = Child and Adult Care Food Program; CPS = Canadian Paediatric Society; DGA = *Dietary Guidelines for Americans*; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; HC = Health Canada; NHMRC = National Health and Medical Research Council; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition; SSB = sugar-sweetened beverage; WHO = World Health Organization; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

[a] This table does not include milk-based infant formulas or human milk.

[b] Lott et al. (2019) was an expert panel report with representation from the Academy of Nutrition and Dietetics, the American Academy of Pediatric Dentistry, the American Academy of Pediatrics, and the American Heart Association.

[c] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[d] Recommendation noted as being valid for Europe and other regions with a low general prevalence of iron deficiency anemia.

[e] © All rights reserved. *Nutrition for healthy term infants: Recommendations from six to 24 months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[f] Health Canada, 2007.

[g] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[h] For cow milk and goat milk only; no literature was presented for sheep milk.

[i] Using the NHMRC system, the strength-of-evidence rating related to this recommendation was a draft Grade D (for risks associated with feeding unmodified cow milk to infants less than 12 months of age). Grade D indicates that the body of evidence is weak and any recommendation must be applied with caution.

[j] Portions of this recommendation could be mapped to a systematic review prepared for this guideline document; other portions appeared to be related to a narrative review of the evidence. Using the NHMRC system, the strength-of-evidence rating related to this recommendation was Grade D (risk associated with cow milk). Grade D indicates that the body of evidence is weak and any recommendation must be applied with caution.

[k] Portions of this recommendation could be mapped to a systematic review prepared for this guideline document; other portions appeared to be related to a narrative review of the evidence and a WHO report (Michaelsen et al., 2003). Using the NHMRC system, the strength-of-evidence rating related to this recommendation was Grade D (risk associated with cow milk). Grade D indicates that the body of evidence is weak and any recommendation must be applied with caution. There was insufficient evidence to provide an evidence statement on unpasteurized cow or goat milk.

[l] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[m] This recommendation contained additional guidance unrelated to milk or milk-based products that has been omitted from this table.

[n] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 12, Copyright (2005).

[o] Recommendation did not specify an age group. The guideline document is aimed at infants, children, and adolescents.

TABLE B-8 Recommendations Related to Fluids: Water, Juice, Sugar-Sweetened Beverages, and Other Nonmilk Beverages[a,b]

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
Water and Fluid Needs			
RWJF-HER	Lott et al., 2019[c]	0–6 months: No supplemental drinking water needed.	Narrative review
		6–12 months: Offer a total of 1/2 to 1 cup (4–8 oz) per day of plain, fluoridated drinking water in a cup during mealtimes.	Narrative review
		1–3 years (12–36 months): 1–4 cups (8–32 oz) per day of plain, fluoridated drinking water.* *The specific amount of plain water consumed between 1 and 5 years is determined for each child based on the total amount of milk consumed per day. For example, if a 3-year-old does not consume any milk in a given day, all fluid needs should be met via plain water, and thus 4 cups of plain water would be advised. However, if the same 3-year-old drank 2 cups of milk in a given day, approximately 2 cups of plain water per day would suffice to meet total fluid needs.	Narrative review
		If 100% juice is consumed, this additional fluid should also be factored into the amount of plain drinking water to consume. If plain drinking water is the only fluid consumed to meet total fluid needs, careful dietary planning is essential to promote adequate nutrient intake from foods.	
SACN	SACN, 2018	Breast milk, infant formula, and water should be the only drinks offered after 6 months of age.	Narrative review
AAP	Heyman et al., 2017	Families should be educated that, to satisfy fluid requirements, human milk and/or infant formula is sufficient for infants and low-fat/nonfat milk and water are sufficient for older children.	Narrative review

RWJF-HER	Pérez-Escamilla et al., 2017	Once your baby starts solid food, it is recommended to offer a total of 4–8 oz per day of plain drinking water in a cup.	Narrative review
		Your toddler needs about 2 cups of water per day to cover her or his fluids needs. Use a cup to offer water.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Advise limiting fruit juice and sweetened beverages. Encourage offering water to satisfy thirst.[d,e]	Narrative review; 2007 *Eating Well with Canada's Food Guide*[f]
NHMRC (Australian government)	NHMRC, 2012[g]	Exclusively breastfed infants do not require additional fluids up to 6 months of age.	Narrative review
New Zealand Ministry of Health	Ministry of Health, 2012[b]	Additional breastfeeds or fluids (in formula-fed infants) may be required if the infant or toddler is unwell or the weather is hot.	Narrative review
		For toddlers, provide plenty of liquids each day such as water, breast milk, or cow milk (although no more than 500 mL per day of cow milk).	Narrative review
		Fruit juices or sweet drinks are not recommended for infants and toddlers. Infants need only milk (breast milk or infant formula) to drink. Toddlers need only breast milk, cow milk, and water to drink.	Narrative review
		For vegetarian and vegan toddlers, provide plenty of liquids each day, as water, breast milk, cow milk, or plant-based milks only (and no more than 500 mL of milk per day).	Narrative review
		Strongly discourage the supplementing of breastfeeding with formula, water, herbal teas, milks, or any other liquids.	Narrative review
New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	Emphasize water/full-fat cow milk as drinks of choice.	Could not be mapped

continued

TABLE B-8 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
NICE	NICE, 2008	Oral Health. Health visitors, GPs, dentists, dental hygienists/assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should encourage parents and carers to provide milk and water to drink between meals (diluted fruit juice can be provided with meals—1 part juice to 10 parts water).	Rapid review,[i] UK Department of Health report[j]
WHO	WHO, 2005	Nonbreastfed infants and young children need at least 400–600 mL/day of extra fluids (in addition to the 200–700 mL/day of water that is estimated to come from milk and other foods) in a temperate climate, and 800–1,200 mL/day in a hot climate. Plain, clean (boiled, if necessary) water should be offered several times per day to ensure that the infant's thirst is satisfied.[k]	A background document and narrative review
Juice[l]			
RWJF-HER	Lott et al., 2019[c]	0–6 months: Juice is not recommended.	2015 DGA and 2017 AAP recommendations for 100% fruit juice consumption
		6–12 months: Juice is not recommended.	2015 DGA and 2017 AAP recommendations for 100% fruit juice consumption
		1–3 years (12–36 months): No more than 4 oz of 100% juice per day.	2015 DGA and 2017 AAP recommendations for 100% fruit juice consumption

AAP	Heyman et al., 2017	Juice should not be introduced into the diet of infants before 12 months of age unless clinically indicated. The intake of juice should be limited to, at most, 4 oz/day in toddlers 1 through 3 years of age, and 4–6 oz/day for children 4–6 years of age.	Narrative review
		Pediatricians should advocate for a reduction in fruit juice in the diets of young children and the elimination of fruit juice in children with abnormal (poor or excessive) weight gain.	Narrative review
		Toddlers should not be given juice from bottles or easily transportable covered cups that allow them to consume juice easily throughout the day. Toddlers should not be given juice at bedtime.	Narrative review
AAPD	AAPD, 2017	AAPD supports the AAP recommendations on fruit juice in infants, children, and adolescents.	2017 AAP recommendations on fruit juice[m]
ESPGHAN	Fewtrell et al., 2017	No sugar or salt should be added to complementary foods, and fruit juices or sugar-sweetened beverages should be avoided.[n]	Systematic literature search
	Fidler Mis et al., 2017	Sugar-containing beverages and foods (SSBs, fruit juices, fruit-based smoothies, and sweetened milk drinks/products) should be replaced by water or, in the latter case, with unsweetened milk drinks/products with lactose up to the amount naturally present in milk and unsweetened milk products.[o]	Systematic literature search
RWJF-HER	Pérez-Escamilla et al., 2017	If you decide to offer 100% fruit juice to your toddler, limit intake to no more than 4 oz per day and offer it with a cup, not a bottle.	Narrative review
AAP; AAPD	AAPD, 2016	To decrease the risk of developing early childhood caries, AAPD encourages professional and at-home preventive measures that include avoiding frequent consumption of liquids and/or solid foods containing sugar, in particular … sugar-sweetened beverages (e.g., juices, soft drinks, sports drinks, sweetened tea) in a baby bottle or no-spill training cup.[p]	Narrative review

continued

TABLE B-8 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Advise limiting fruit juice and sweetened beverages. Encourage offering water to satisfy thirst.[d]	Narrative review; based on the 2007 *Eating Well with Canada's Food Guide*[f]
NHMRC (Australian government)	NHMRC, 2012[g]	Fruit juice is not necessary or recommended for infants. Consumption may interfere with their intake of breast milk or infant formula.	Narrative review
		Avoid juices and sugar-sweetened drinks. Limit intake of all foods with added sugars.	Systematic review[q]
		Do not offer tea, herbal teas, coffee, soft drinks, cordials, or other beverages.	Narrative review
New Zealand Ministry of Health	Ministry of Health, 2012[h]	Fruit juices or sweet drinks are not recommended for infants and toddlers. Infants need only milk (breast milk or infant formula) to drink. Toddlers need only breast milk, cow milk, and water to drink.	Narrative review
NICE	NICE, 2008	Oral Health. Health visitors, GPs, dentists, dental hygienists/assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should encourage parents and carers to provide milk and water to drink between meals (diluted fruit juice can be provided with meals—1 part juice to 10 parts water).	Rapid review,[i] UK Department of Health report[j]
		Oral Health. Health visitors, GPs, dentists, dental hygienists/assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should discourage parents and carers from offering baby juices or sugary drinks at bedtime.	Rapid review,[i] UK Department of Health report[j]

New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	Advise parents that fruit drinks and juice, cordials, and other sweetened drinks (including soft drinks and sports drinks) are not recommended.[r]	Narrative review
		Discuss healthy eating and remind parents to choose nutritious and tooth-friendly snacks. Sweet drinks, such as fruit drinks and juice, cordials, and soft drinks, are not recommended.[p]	Could not be mapped
AHA	Gidding et al., 2005	Improving nutritional quality after weaning: Delay the introduction of 100% juice until at least 6 months of age and limit to no more than 4–6 oz/day; juice should only be fed from a cup.	Could not be mapped
WHO	WHO, 2005	Feed a variety of foods to ensure that nutrient needs are met. Avoid giving drinks with low nutrient value, such as tea, coffee, and sugary soft drinks. Limit the amount of juice offered, to avoid displacing more nutrient-rich foods.[s]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Feed a variety of foods to ensure that nutrient needs are met…. Avoid giving drinks with low nutrient value, such as tea, coffee, and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.[t]	Technical consultations and documents
Sugar-Sweetened Beverages			
RWJF-HER	Lott et al., 2019[c]	0–5 years: SSBs are not recommended, including, but not limited to, soft drinks/soda, fruit drinks, fruit-flavored drinks, fruitades, sports drinks, energy drinks, sweetened waters, and sweetened coffee and tea beverages.	Narrative review
ESPGHAN	Fewtrell et al., 2017	No sugar or salt should be added to complementary foods and fruit juices or SSBs should be avoided.[n]	Systematic literature search
	Fidler Mis et al., 2017	Sugar-containing beverages and foods (SSBs, fruit juices, fruit-based smoothies, and sweetened milk drinks/products) should be replaced by water or, in the latter case, with unsweetened milk drinks/products with lactose up to the amount naturally present in milk and unsweetened milk products.[o]	Systematic literature search

continued

TABLE B-8 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
RWJF-HER	Pérez-Escamilla et al., 2017	It is strongly recommended to offer *no* SSBs such as flavored drinks, including Kool-Aid, fruit drinks, sodas, horchata (sweetened rice water), sports drinks, sweetened teas, or any other SSBs, to your baby during the first year of life. Doing so could reinforce your baby's strong preference for sugary food and beverages and make it more difficult for her or him to learn to like healthy food such as vegetables, fruits, and plain water.	Narrative review
AAP; AAPD	AAPD, 2016	To decrease the risk of developing early childhood caries, AAPD encourages professional and at-home preventive measures that include avoiding frequent consumption of liquids and/or solid foods containing sugar, in particular … SSBs (e.g., juices, soft drinks, sports drinks, sweetened tea) in a baby bottle or no-spill training cup.[u]	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Advise limiting fruit juice and sweetened beverages. Encourage offering water to satisfy thirst.	Narrative review; based on the 2007 *Eating Well with Canada's Food Guide*[f]
NHMRC (Australian government)	NHMRC, 2012[g]	Avoid juices and sugar-sweetened drinks. Limit intake of all foods with added sugars.	Systematic review[q]
		Do not offer tea, herbal teas, coffee, soft drinks, cordials, or other beverages.	Narrative review
New Zealand Ministry of Health	Ministry of Health, 2012[b]	Fruit juices or sweet drinks are not recommended for infants and toddlers. Infants need only milk (breast milk or infant formula) to drink. Toddlers need only breast milk, cow milk, and water to drink.	Narrative review
NICE	NICE, 2008	Oral Health. Health visitors, GPs, dentists, dental hygienists/assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should discourage parents and carers from offering baby juices or sugary drinks at bedtime.	Rapid review,[i] UK Department of Health report[j]

New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	Advise parents that fruit drinks and juice, cordials, and other sweetened drinks (including soft drinks and sports drinks) are not recommended.[r]	Narrative review
		Discuss healthy eating and remind parents to choose nutritious and tooth-friendly snacks.… Sweet drinks such as fruit drinks and juice, cordials, and soft drinks, are not recommended.[u]	Could not be mapped
WHO	WHO, 2005	Feed a variety of foods to ensure that nutrient needs are met. Avoid giving drinks with low nutrient value, such as tea, coffee, and sugary soft drinks. Limit the amount of juice offered, to avoid displacing more nutrient-rich foods.[s]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Feed a variety of foods to ensure that nutrient needs are met.… Avoid giving drinks with low nutrient value, such as tea, coffee, and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.[t]	Technical consultations and documents
Coffee and Tea			
RWJF-HER	Lott et al., 2019[c]	0–5 years: SSBs are not recommended, including, but not limited to, soft drinks/soda, fruit drinks, fruit-flavored drinks, fruitades, sports drinks, energy drinks, sweetened waters, and sweetened coffee and tea beverages.	Narrative review
NHMRC (Australian government)	NHMRC, 2012[g]	Do not offer tea, herbal teas, coffee, soft drinks, cordials, or other beverages.	Narrative review
New Zealand Ministry of Health	Ministry of Health, 2012[h]	Coffee, tea, herbal teas, caffeine-containing beverages, smart or energy drinks, carbonated beverages, and alcohol are not recommended for infants and toddlers.	Narrative review
		Do not give infants and toddlers alcohol, coffee, cordials, juice, soft drinks, tea (including herbal teas), and other drinks containing caffeine.	Narrative review

continued

TABLE B-8 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
WHO	WHO, 2005	Feed a variety of foods to ensure that nutrient needs are met. Avoid giving drinks with low nutrient value, such as tea, coffee, and sugary soft drinks. Limit the amount of juice offered, to avoid displacing more nutrient-rich foods.[s]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Feed a variety of foods to ensure that nutrient needs are met…. Avoid giving drinks with low nutrient value, such as tea, coffee, and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.[t]	Technical consultations and documents
Caffeinated Beverages			
RWJF-HER	Lott et al., 2019[c]	0–5 years: Do not consume caffeinated beverages.	Narrative review
New Zealand Ministry of Health	Ministry of Health, 2012[b]	Coffee, tea, herbal teas, caffeine-containing beverages, smart or energy drinks, carbonated beverages, and alcohol are not recommended for infants and toddlers.	Narrative review
		Do not give infants and toddlers alcohol, coffee, cordials, juice, soft drinks, tea (including herbal teas), and other drinks containing caffeine.	Narrative review
Beverages of Low Nutrient Value			
WHO	WHO, 2005	Feed a variety of foods to ensure that nutrient needs are met. Avoid giving drinks with low nutrient value, such as tea, coffee, and sugary soft drinks. Limit the amount of juice offered, to avoid displacing more nutrient-rich foods.[s]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Feed a variety of foods to ensure that nutrient needs are met…. Avoid giving drinks with low nutrient value, such as tea, coffee, and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.[t]	Technical consultations and documents

Plant-Based Beverages			
RWJF-HER	Lott et al., 2019[c]	0–12 months: Plant milks/nondairy beverages are not recommended.	DGAs
		1–5 years (12–60 months): Plant milks/nondairy beverages are not recommended for exclusive consumption in place of dairy milk (with the exception of soy milk); consume only when medically indicated or to meet specific dietary preferences.	DGAs
	Pérez-Escamilla et al., 2017	Plant-based beverages (e.g., soy, rice, almond milks) are *not* recommended for your child in place of breast milk or formula, unless prescribed by your pediatrician (e.g., commercially prepared soy-based infant formula). These beverages are not designed to meet the nutritional needs of your child to the same extent as breast milk or infant formula.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2015	Discourage the use of homemade, evaporated milk formula. Cow milk, goat milk, soy beverage, rice beverage, or any other beverages should not be given to young infants.[v,w]	Narrative review
	Health Canada et al., 2014	For an older infant or young child who is not breastfed or receiving breast milk: Advise that soy, rice, or other plant-based beverages, whether or not they are fortified, are inappropriate alternatives to cow milk in the first 2 years.[d]	Narrative review
New Zealand Ministry of Health	Ministry of Health, 2012[b]	For vegetarian and vegan toddlers, provide plenty of liquids each day, as water, breast milk, cow milk, or plant-based milks only (and no more than 500 mL of milk per day).	Narrative review
		For toddlers who do not have cow milk or milk products, calcium-fortified milk alternatives can provide calcium.	Narrative review

continued

TABLE B-8 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
NHMRC (Australian government)	NHMRC, 2012[g]	Rice and oat milk can be used after 12 months, as long as a full-fat, fortified variety (at least 100 mg of calcium per 100 mL) is used and alternative forms of protein and vitamin B12 are included in the diet. These products are suitable when used under health professional supervision.	Could not be mapped
		Soy (except fortified soy products and soy formula where specifically indicated), and other nutritionally incomplete alternate milks or milk substitutes (e.g., goat milk, sheep milk, coconut milk, almond milk) are inappropriate alternatives to breast milk, formula, or pasteurized whole cow milk in the first 2 years of life.	Systematic review;[x] narrative review

NOTE: AAP = American Academy of Pediatrics; AAPD = American Academy of Pediatric Dentistry; AHA = American Heart Association; CPS = Canadian Paediatric Society; DGA = *Dietary Guidelines for Americans*; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; GP = general practitioner; HC = Health Canada; mg = milligrams; mL = milliliters; NHMRC = National Health and Medical Research Council; NICE = National Institute for Health and Care Excellence; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition; SSB = sugar-sweetened beverage; UK = United Kingdom; WHO = World Health Organization.

[a] This table does not include recommendations related to infant formulas. Recommendations are duplicated in this table if they address multiple subtopics (italicized text).

[b] One recommendation on beverages containing low-calorie sweetener has been omitted from this table, but it is found in Table B-9, Recommendations Related to Substances to Avoid or Limit.

[c] Lott et al. (2019) was an expert panel report with representation from the Academy of Nutrition and Dietetics, the American Academy of Pediatric Dentistry, the American Academy of Pediatrics, and the American Heart Association.

[d] © All rights reserved. *Nutrition for healthy term infants: Recommendations from six to 24 months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[e] This recommendation pertains to children 12–24 months of age.

[f] Health Canada, 2007.

[g] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[h] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[i] Each recommendation was associated with multiple evidence statements. Each evidence statement was taken from a review of effectiveness. Some of the evidence statements give a strength-of-evidence rating (++, +, –). There is no overall statement on the strength of the evidence for each recommendation.

[j] Department of Health, 1994.

[k] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Fluid Needs, p. 20, Copyright (2005).

[l] Recommendations listed in this section include those focused specifically on juice and those in which juice is one of multiple beverages listed.

[m] Heyman et al., 2017.

[n] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[o] Recommendation did not specify an age group. The guideline document is aimed at infants, children, and adolescents.

[p] This recommendation contained additional guidance unrelated to juice that has been omitted from this table.

[q] Using the NHMRC system, the strength-of-evidence rating related to this recommendation was Grade C (for intake of sugar and risk of dental disease). Grade C (suggestive association) indicates that the body of evidence provides some support for the recommendations but care should be taken in its application.

[r] Recommendation was given for both infants 6–12 months of age and toddlers 12–24 months of age.

[s] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 12, Copyright (2005).

[t] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

[u] This recommendation contained additional guidance unrelated to sugar-sweetened beverages that has been omitted from this table.

[v] © All rights reserved. *Nutrition for healthy term infants: Recommendations from birth to six months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[w] Recommendation is applicable to infants from birth to 6 months of age.

[x] Portions of this recommendation could be mapped to a systematic review prepared for this guideline document; other portions appeared to be related to a narrative review of the evidence. There was insufficient evidence to provide an evidence statement on unpasteurized cow or goat milk.

TABLE B-9 Recommendations Related to Substances to Avoid or Limit[a]

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
AAP	Baker-Smith et al., 2019	No advice can be provided on the use of nonnutritive sweeteners in children younger than 2 years old given the absence of data on this age group.	Lack of evidence[b]
RWJF-HER	Lott et al., 2019[c]	0–5 years: Beverages with low-calorie sweeteners are not recommended.	Narrative review[d]
SACN	SACN, 2018	In view of the high intakes of salt (sodium chloride) and free sugars in this age group, there is a need to reemphasize the risks associated with added salt and free sugars in foods given to infants during the complementary feeding period and to keep reported intakes under review.	Narrative review
AAPD	AAPD, 2017	AAPD supports the recommendation of national and international organizations to reduce the consumption of sugar to less than 10% of total energy intake and, to reduce children's risk of weight gain and dental caries, sugar intake should be less than 5% of total energy intake (less than 16 g of sugar for children aged 4–8).[e]	DGA, WHO, and AHA
ESPGHAN	Fewtrell et al., 2017	No sugar or salt should be added to complementary foods, and fruit juices or SSBs should be avoided.[f]	Systematic literature search
	Fidler Mis et al., 2017	Intakes of free sugars should be reduced and minimized with a desirable upper limit of < 5% energy intake in children and adolescents aged ≥ 2–18 years. This represents: 15–28 g of free sugars (3.5–7 teaspoons) for girls; 16–37 g (4–9 teaspoons) for boys, according to age. Intakes should be even lower in infants and toddlers < 2 years.	Systematic literature search
		Sugars should preferably be consumed in a natural form such as human milk, milk, unsweetened dairy products, fresh fruits, rather than as SSBs, fruit juices, smoothies, and/or sweetened milk drinks/products, and as a part of a main meal, not as snacks.[g]	Systematic literature search

RWJF-HER	Pérez-Escamilla et al., 2017	Avoid feeding your toddler food that is high in sodium (salt) such as processed meats like ham, lunch meats, and packaged breaded chicken and fish.	Narrative review
		During the transition to family food, continue to expose your baby to healthy food including plenty of vegetables and fruits, and avoid offering unhealthy food such as SSBs, sweets, salty food/snacks, and fried food/snacks that are high in added sugars, calories, and/or salt.	Narrative review
		Limit your toddler's consumption of snacks high in sodium and with added sugars.	Narrative review
		Offer healthy meals and snacks to the entire family, and do not have unhealthy food around her or him, including SSBs, sweets, salty snacks, and fried food/snacks.	Narrative review
		When preparing food for your infant, do not add salt or sugar. Likewise, when choosing baby food that is already prepared, choose options without (or with limited amounts of) added salt or sugars.	Narrative review
		You can offer 1/2 to 3/4 cup of yogurt in place of milk during meal or snack times, but serve only plain yogurt or yogurt without excessive total sugars (no more than 23 g per 6 oz).	Narrative review
AAP; AAPD	AAPD, 2016	To decrease the risk of developing early childhood caries, AAPD encourages professional and at-home preventive measures that include avoiding frequent consumption of liquids and/or solid foods containing sugar, in particular: a. SSBs (e.g., juices, soft drinks, sports drinks, sweetened tea) in a baby bottle or no-spill training cup. b. ad libitum breastfeeding after the first primary tooth begins to erupt and other dietary carbohydrates are introduced. c. baby bottle use after 12–18 months.	Narrative review

continued

TABLE B-9 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Recommend foods prepared with little or no added salt or sugar.[b]	Narrative review; 2007 *Eating Well with Canada's Food Guide*[i]
NHMRC (Australian government)	NHMRC, 2012[j]	Avoid juices and sugar-sweetened drinks. Limit intake of all foods with added sugars.	Systematic review[k]
		Consumption of nutrient-poor discretionary foods with high levels of saturated fat, added sugars, and/or added salt (e.g., cakes, biscuits and potato chips) should be avoided.	Systematic reviews[l]
		Do not add salt to foods for infants. This is an important safety issue as infant kidneys are immature and unable to excrete excess salt.	Systematic review[m]
		Do not add sugar or honey to infant foods as this increases the risk of dental caries.	Systematic review[k]
		Do not dip pacifiers or bottle teats in sugar, jam, honey, or any other sugary substance.	Could not be mapped
New Zealand Ministry of Health	Ministry of Health, 2012[n]	Do not dip pacifiers or bottle teats in sugar or honey.	2008 New Zealand Dental Association guide[o]
		Dried fruit is not recommended as a snack between meals because it sticks to teeth and is cariogenic.	2008 New Zealand Dental Association guide[o]
		For infants, prepare or choose pre-prepared complementary foods with no added fat, salt, sugar, honey, or other sweeteners.	Narrative review
		For toddlers, prepare foods or choose pre-prepared foods, drinks, and snacks that are low in salt, but if using salt, use iodized salt, and that have little added sugar (and limit the toddler's intake of high-sugar foods).	Narrative review

		Liver and pâté are excellent sources of vitamin A. However, infants should not be offered liver or pâté more than once per week, and no more than 10 g per serving.	Narrative review
New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	If a pacifier is used, advise parents not to dip the pacifier in sugar, honey, or any other sweetened drinks.	2008 New Zealand Ministry of Health guidelines[p]
		Remind parents that if sugar foods are eaten they should be taken at mealtimes instead of as snacks.	2005 NHS Scotland guideline[q]
		Remind parents to choose foods and drinks low in sugar.	Narrative review
NICE	NICE, 2008	Child health promotion. Health visitors and the CHPP team should encourage and support parents and carers to make home-prepared foods for infants and young children without adding salt, sugar, or honey.	Rapid review,[r] UK Department of Health report[s]
		Oral Health. Health visitors, GPs, dentists, dental hygienists/ assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should discourage parents and carers from adding sugar or any solid food to bottle feeds.	Rapid review,[r] UK Department of Health report[s]
		Oral Health. Health visitors, GPs, dentists, dental hygienists/ assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should discourage parents and carers from adding sugar or honey to weaning (solid) foods.	Rapid review,[r] UK Department of Health report[s]
		Oral Health. Health visitors, GPs, dentists, dental hygienists/ assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should encourage parents and carers to avoid giving biscuits or sweets as treats.	Rapid review,[r] UK Department of Health report[s]

continued

TABLE B-9 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
NICE (continued)	NICE, 2008	Oral Health. Health visitors, GPs, dentists, dental hygienists/ assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should encourage parents and carers to encourage snacks free of salt and added sugar (such as vegetables and fruit) between meals.	Rapid review,[r] UK Department of Health report[s]
		Oral Health. Health visitors, GPs, dentists, dental hygienists/ assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should encourage parents and carers to limit sugary foods to mealtimes only.	Rapid review,[r] UK Department of Health report[s]
AHA	Gidding et al., 2005	Improving nutritional quality after weaning: Introduce healthy foods and continue offering if initially refused; do not introduce foods without overall nutritional value simply to provide calories.	Narrative review

NOTE: AAP = American Academy of Pediatrics; AAPD = American Academy of Pediatric Dentistry; AHA = American Heart Association; CHPP = Child Health Promotion Programme; CPS = Canadian Paediatric Society; DGA = *Dietary Guidelines for Americans*; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; g = grams; GP = general practitioner; HC = Health Canada; NHMRC = National Health and Medical Research Council; NHS = National Health Service (United Kingdom); NICE = National Institute for Health and Care Excellence; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SSB = sugar-sweetened beverage; UK = United Kingdom; WHO = World Health Organization.

[a] With the exception of the recommendation related to beverages containing low-calorie sweeteners, this section has omitted recommendations that only address beverages. Recommendations specifically related to beverages are found in Table B-8. Recommendations related to the risk of botulism with honey intake are found in Table B-21.

[b] The guideline, which was based on narrative review, notes that there is a lack of evidence on this topic; accordingly, no evidence was cited.

[c] Lott et al. (2019) was an expert panel report with representation from the Academy of Nutrition and Dietetics, the American Academy of Pediatric Dentistry, the American Academy of Pediatrics, and the American Heart Association.

[d] The guideline, which was based on narrative review, notes that there is a lack of evidence for young children; accordingly, the recommendation was based on expert opinion.

[e] It is unclear if this statement is relevant to children from birth to 24 months.

[f] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[g] Recommendation did not specify an age group. The guideline document is aimed at infants, children, and adolescents.

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[i] Health Canada, 2007.

[j] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[k] Using the NHMRC system, the strength-of-evidence rating related to this recommendation was Grade C (for sugar's effect on risk of dental disease). Grade C (suggestive association) indicates that the body of evidence provides some support for the recommendations but care should be taken in its application.

[l] The systematic reviews were only related to sugar and salt. Using the NHMRC system, the strength-of-evidence ratings related to this recommendation were as follows: Grade A (for salt or sodium having an effect on blood pressure in children and adolescents) and Grade C (for sugar's effect on risk of dental disease). Grade A (convincing association) indicates that the body of evidence can be trusted to guide practice. Grade C (suggestive association) indicates that the body of evidence provides some support for the recommendations but care should be taken in its application.

[m] Using the NHMRC system, the strength-of-evidence rating related to this recommendation was Grade A (for salt or sodium having an effect on blood pressure in children and adolescents). Grade A (convincing association) indicates that the body of evidence can be trusted to guide practice. The rationale related to infant kidney immaturity could not be mapped to its evidence.

[n] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[o] New Zealand Dental Association, 2008.

[p] Ministry of Health, 2008.

[q] NHS Scotland, 2005.

[r] Each recommendation was associated with multiple evidence statements. Each evidence statement was taken from a review of effectiveness. Some of the evidence statements give a strength-of-evidence rating (++, +, –). There is no overall statement on the strength of the evidence for each recommendation.

[s] Department of Health, 1994.

TABLE B-10 Recommendations Related to Variety and Healthy, Nutritious Foods

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
SACN	SACN, 2018	Dietary, flavor, and texture diversification should proceed incrementally throughout the complementary feeding period, taking into account the variability between infants in developmental attainment and the need to satisfy nutritional requirements. When introducing new foods it should be recognized that they may need to be presented to infants on many occasions before they are accepted, particularly as infants get older.	Narrative review
ESPGHAN	Fewtrell et al., 2017	Recommendations on specific types of complementary foods should take into consideration traditions and feeding patterns in the population. Infants should be offered a varied diet including foods with different flavors and textures including bitter-tasting green vegetables.[a]	Systematic literature search
RWJF-HER	Pérez-Escamilla et al., 2017	During the transition to family food, continue to expose your baby to healthy food including plenty of vegetables and fruits, and avoid offering unhealthy food such as sugar-sweetened beverages, sweets, salty food/snacks, and fried food/snacks that are high in added sugars, calories, and/or salt.	Narrative review
		Feed your baby only healthy food that provides plenty of vitamins, minerals, and fiber, including fresh vegetables, fruits, and age-appropriate whole grain products. Also, make sure to feed your baby nutritious food that provides an adequate amount of protein (such as eggs, fish, meat) and energy.[b]	Narrative review
		Offer your child the recommended portion of healthy food from the different food groups (fruits, vegetables, grains, proteins, dairy) at each meal, and let her or him decide how much to eat.[c]	Narrative review
		Provide healthy, tasty food that is appropriate for your child's age at regular times and in a pleasant environment, and let your baby decide how much she or he wants to eat.[b]	Narrative review

		Remember that it may take more tries for your baby to learn to like vegetables than other healthy food like fruits. Continue offering a variety of vegetables and other healthy food, and let your child decide when she or he is ready.	Narrative review
SIGENP; SIAIP	Alvisi et al., 2015[d]	The child's diet will be better inasmuch as the family will follow a correct and balanced diet, mindful of the caloric and protein intake. It is therefore of paramount importance to provide parents with the right information about a nutritionally balanced diet, and encourage them to recognize and respect every child's self-regulatory capacity. It is also important to promote the daily consumption of fruits and vegetables.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Explain to parents and caregivers that nutritious, higher-fat foods are an important source of energy for young children.[e]	Narrative review; 2007 *Eating Well with Canada's Food Guide*[f]
		Ensure that lumpy textures are offered no later than 9 months. Encourage progress toward a variety of textures, modified from family foods, by 1 year of age.[e]	Narrative review
		Recommend a regular schedule of meals and snacks, offering a variety of foods from the four food groups.[e]	Narrative review; 2007 *Eating Well with Canada's Food Guide*[f]
		Recommend iron-rich meat, meat alternatives, and iron-fortified cereal as the first complementary foods. Encourage parents and caregivers to progress to introduce a variety of nutritious foods from the family meals.[e]	Narrative review

continued

TABLE B-10 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
New Zealand Ministry of Health	Ministry of Health, 2012[g]	The variety of complementary foods should be increased to ensure an additional intake of nutrients, especially zinc. At around 6 months of age, meat or chicken purées can be added. As chewing skills develop, finely chopped meats can be introduced. Infants should be eating family foods by around 1 year of age.	Narrative review
		(For vegetarian and vegan infants and toddlers): Toddlers should be offered a variety of nutritious foods from each of the major food groups each day. The food groups are vegetables and fruit; breads and cereals, preferably wholemeal; milk and milk products or suitable alternatives; vegetarian protein foods, such as pulses (peas, beans, lentils, soy), grains (wheat, oats, rice, barley, buckwheat, millet, pasta, bread), nuts (not whole), meat substitutes, eggs, and nut butters.	Narrative review
		(For vegetarian and vegan infants and toddlers): Once an infant has started complementary foods, the variety should be increased to ensure an additional intake of nutrients, especially energy, protein, iron, calcium, and vitamin B12.	Narrative review
		Increase the texture, variety, flavor, and amount of food offered so the infant receives an additional intake of nutrients, especially iron and vitamin C, and is eating some family foods by around 1 year of age.	Narrative review
		Infants and toddlers should be offered a wide variety of vegetables and fruit, including dark-green leafy vegetables (spinach, silverbeet, or pūhā) and yellow, red, and orange-colored vegetables and fruit (carrots, pumpkin, kūmara, tomatoes, apricots, tamarillos).	Narrative review
		Maintain healthy growth and development of the infant and toddler by providing them with appropriate food and physical activity opportunities every day.	Narrative review

		Offer toddlers a variety of nutritious foods from each of the major food groups each day. The food groups are vegetables and fruit; breads and cereals, including wholemeal; milk and milk products or suitable alternatives; lean meat, poultry, seafood, eggs, legumes, nuts, and seeds.* *Do not give small hard foods like whole nuts and large seeds until children are at least 5 years old.	Narrative review
		The variety of complementary foods should be increased to ensure an additional intake of nutrients, especially iron. Iron-fortified infant cereals are suitable starter foods, and absorption can be enhanced if the infant is also given foods containing vitamin C. Once the infant is around 6 months of age, meat or chicken purées can be added to their feeds, and as they develop chewing skills finely chopped meats can be introduced. Infants should be eating some family foods by around 1 year of age.	Narrative review
NICE	NICE, 2008	Child health promotion: Health visitors and the CHPP team should provide mothers and other family members with support to introduce a variety of nutritious foods (in addition to milk) to ensure the child is offered a progressively varied diet from 6 months.	Rapid review,[b] UK Department of Health report[i]
AHA	Gidding et al., 2005	Improving nutritional quality after weaning: Introduce healthy foods and continue offering if initially refused; do not introduce foods without overall nutritional value simply to provide calories.	Narrative review
WHO	WHO, 2005	Feed a variety of foods to ensure that nutrient needs are met. Avoid giving drinks with low nutrient value, such as tea, coffee and sugary soft drinks. Limit the amount of juice offered, to avoid displacing more nutrient-rich foods.[j]	A background document and narrative review

continued

TABLE B-10 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
WHO (continued)	WHO, 2005	Feed a variety of foods to ensure that nutrient needs are met. Dairy products are the richest sources of calcium. If dairy products are not consumed in adequate amounts, other foods that contain relatively large amounts of calcium, such as small fish that include the bones (dried or fresh, with the bones crushed or otherwise processed so that they are safe to eat) and lime-treated maize tortillas, can fill the gap. Other foods such as soybeans, cabbage, carrots, squash, papaya, dark green leafy vegetables, guava, and pumpkin are useful additional sources of calcium.[j]	A background document and narrative review
		Feed a variety of foods to ensure that nutrient needs are met. If adequate amounts of other animal-source foods are consumed regularly, the amount of milk needed is ~200–400 mL/day; otherwise, the amount of milk needed is ~300–500 mL/day. Acceptable milk sources include full-cream animal milk (cow, goat, buffalo, sheep, camel), ultrahigh temperature (UHT) milk, reconstituted evaporated (but not condensed) milk, fermented milk or yogurt, and expressed breast milk (heat treated if the mother is HIV positive).[j]	A background document and narrative review
		Feed a variety of foods to ensure that nutrient needs are met. If milk and other animal-source foods are not eaten in adequate amounts, both grains and legumes should be consumed daily, if possible within the same meal, to ensure adequate protein quality.[j]	A background document and narrative review
		Feed a variety of foods to ensure that nutrient needs are met. Meat, poultry, fish, or eggs should be eaten daily, or as often as possible, because they are rich sources of many key nutrients such as iron and zinc. Milk products are rich sources of calcium and several other nutrients. Diets that do not contain animal-source foods (meat, poultry, fish, or eggs, plus milk products) cannot meet all nutrient needs at this age unless fortified products or nutrient supplements are used.[j]	A background document and narrative review

		Feed a variety of foods to ensure that nutrient needs are met. Provide diets with adequate fat content. If animal source foods are not consumed regularly, 10–20 g of added fats or oils are needed unless a fat-rich food is given (such as foods or pastes made from groundnuts, other nuts, and seeds). If animal-source foods are consumed, up to 5 g of additional fats or oils may be needed.[j]	A background document and narrative review
		Feed a variety of foods to ensure that nutrient needs are met. The daily diet should include vitamin A–rich foods (e.g., dark colored fruits and vegetables, red palm oil, vitamin A–fortified oil or foods); vitamin C–rich foods (e.g., many fruits, vegetables, and potatoes) consumed with meals to enhance iron absorption; and foods rich in the B vitamins including riboflavin (e.g., liver, egg, dairy products, green leafy vegetables, soybeans), vitamin B6 (e.g., meat, poultry, fish, banana, green leafy vegetables, potato and other tubers, peanuts), and folate (e.g., legumes, green leafy vegetables, orange juice).[j]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Feed a variety of foods to ensure that nutrient needs are met. Meat, poultry, fish, or eggs should be eaten daily, or as often as possible. Vegetarian diets cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used.… Vitamin A–rich fruits and vegetables should be eaten daily. Provide diets with adequate fat content.… Avoid giving drinks with low nutrient value, such as tea, coffee, and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.[k]	Technical consultations and documents

NOTE: AHA = American Heart Association; CHPP = Child Health Promotion Programme; CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; HC = Health Canada; NICE = National Institute for Health and Care Excellence; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition; SIAIP = Italian Society of Pediatric Allergology and Immunology; SIGENP = Italian Society of Gastroenterology, Hepatology and Pediatric Nutrition; UK = United Kingdom; WHO = World Health Organization.

[a] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[b] Recommendation is applicable to infants 6–12 months of age.

continued

TABLE B-10 Continued

[c] Recommendation is applicable to children 12–24 months of age.

[d] Alvisi et al., 2015, is licensed under CC BY 4.0 (http://creativecommons.org/licenses/by/4.0).

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[f] Health Canada, 2007.

[g] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[h] Each recommendation was associated with multiple evidence statements. Each evidence statement was taken from a review of effectiveness. Some of the evidence statements give a strength-of-evidence rating (++, +, –). There was no overall statement on the strength of the evidence for each recommendation.

[i] Department of Health, 1994.

[j] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, pp. 12–13, Copyright (2005).

[k] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

TABLE B-11 Recommendations Related to Fruits and Vegetables

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
AAP	Heyman et al., 2017	Children should be encouraged to eat whole fruit to meet their recommended daily fruit intake and should be educated regarding the benefit of fiber intake and the longer time to consume the same kilocalories when consuming whole fruit compared with fruit juice.	Narrative review
ESPGHAN	Fewtrell et al., 2017	Recommendations on specific types of complementary foods should take into consideration traditions and feeding patterns in the population. Infants should be offered a varied diet including foods with different flavors and textures including bitter-tasting green vegetables.[a]	Systematic literature search
RWJF-HER	Pérez-Escamilla et al., 2017	During the transition to family food, continue to expose your baby to healthy food including plenty of vegetables and fruits, and avoid offering unhealthy food such as sugar-sweetened beverages, sweets, salty food/snacks, and fried food/snacks that are high in added sugars, calories, and/or salt.	Narrative review
		Feed your baby only healthy food that provides plenty of vitamins, minerals, and fiber, including fresh vegetables, fruits, and age-appropriate whole grain products. Also, make sure to feed your baby nutritious food that provides an adequate amount of protein (such as eggs, fish, meat) and energy.	Narrative review
		Include a variety of vegetables, especially dark green, red, and orange types. These vegetables are rich in many nutrients that are difficult to get in adequate amounts from other food.	Narrative review
		Remember that it may take more tries for your baby to learn to like vegetables than other healthy food like fruits. Continue offering a variety of vegetables and other healthy food, and let your child decide when she or he is ready.	Narrative review

continued

TABLE B-11 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
RWJF-HER (continued)	Pérez-Escamilla et al., 2017	When introducing a new vegetable, it is recommended to mix it first with a familiar food such as breast milk, formula, or cereal. Combining new food items that are more difficult to accept by babies, such as some vegetables, with food they are already familiar with can help your baby accept and learn to like vegetables more readily.	Narrative review
		Whenever possible, offer fresh fruit instead of 100% fruit juice to your toddler since whole fruit provides less sugar and more fiber than juice.	Narrative review
		After introducing iron- and zinc-fortified baby cereals or mashed meats, there is no particular order to follow for introducing solid food. At this point, your baby is able to digest and absorb the nutrients from healthy food belonging to different food groups. However, it is important to keep in mind that the earlier vegetables are introduced (once your baby is ready to consume solid food), the more she or he is likely to easily accept them.	Narrative review
SIGENP; SIAIP	Alvisi et al., 2015[b]	The child's diet will be better inasmuch as the family will follow a correct and balanced diet, mindful of the caloric and protein intake. It is therefore of paramount importance to provide parents with the right information about a nutritionally balanced diet, and encourage them to recognize and respect every child's self-regulatory capacity. It is also important to promote the daily consumption of fruits and vegetables.	Narrative review
New Zealand Ministry of Health	Ministry of Health, 2012[c]	Dried fruit is not recommended as a snack between meals because it sticks to teeth and is cariogenic.	2008 New Zealand Dental Association guide[d]
		Infants and toddlers should be offered a wide variety of vegetables and fruit, including dark-green leafy vegetables (spinach, silverbeet or pūhā) and yellow, red, and orange-colored vegetables and fruit (carrots, pumpkin, kūmara, tomatoes, apricots, tamarillos).	Narrative review

AAP	Baker et al., 2010	Toddlers 1 through 3 years of age should have an iron intake of 7 mg/day. This would be best delivered by eating red meats, cereals fortified with iron, vegetables that contain iron, and fruits with vitamin C, which augments the absorption of iron. For toddlers not receiving this iron intake, liquid supplements are suitable for children 12–36 months of age, and chewable multivitamins can be used for children 3 years and older.	Iron DRIs[e]
NICE	NICE, 2008	Oral Health. Health visitors, GPs, dentists, dental hygienists/assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should encourage parents and carers to encourage snacks free of salt and added sugar (such as vegetables and fruit) between meals.	Rapid review,[f] UK Department of Health report[g]
PAHO/WHO	PAHO/WHO, 2003	Feed a variety of foods to ensure that nutrient needs are met. Meat, poultry, fish, or eggs should be eaten daily, or as often as possible. Vegetarian diets cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used.… Vitamin A–rich fruits and vegetables should be eaten daily. Provide diets with adequate fat content.… Avoid giving drinks with low nutrient value, such as tea, coffee, and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.[h]	Technical consultations and documents

NOTE: AAP = American Academy of Pediatrics; DRI = Dietary Reference Intake; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; GP = general practitioner; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SIAIP = Italian Society of Pediatric Allergology and Immunology; SIGENP = Italian Society of Gastroenterology, Hepatology and Pediatric Nutrition; UK = United Kingdom; WHO = World Health Organization.

[a] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[b] Alvisi et al., 2015, is licensed under CC BY 4.0 (http://creativecommons.org/licenses/by/4.0).

[c] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[d] New Zealand Dental Association, 2008.

[e] Citation pertains to the first sentence. Evidence could not be mapped for the remainder of the recommendation.

[f] Each recommendation was associated with multiple evidence statements. Each evidence statement was taken from a review of effectiveness. Some of the evidence statements give a strength-of-evidence rating (++, +, –). There is no overall statement on the strength of the evidence for each recommendation.

[g] Department of Health, 1994.

[h] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

TABLE B-12 Recommendations Related to Vegetarian and Vegan Diets

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
RWJF-HER	Lott et al., 2019[a]	1–5 years (12–60 months): Plant milks/nondairy beverages are not recommended for exclusive consumption in place of dairy milk (with the exception of soy milk); consume only when medically indicated or to meet specific dietary preferences.	DGA
ESPGHAN	Fewtrell et al., 2017	Vegan diets should only be used under appropriate medical or dietetic supervision to ensure that the infant receives a sufficient supply of vitamin B12, vitamin D, iron, zinc, folate, n-3 LCPUFA, protein, and calcium, and that the diet is sufficiently nutrient and energy dense. Parents should understand the serious consequences of failing to follow advice regarding supplementation of the diet.[b]	Systematic literature search
AND	AND, 2016	It is the position of the Academy of Nutrition and Dietetics that appropriately planned vegetarian, including vegan, diets are healthful, nutritionally adequate, and may provide health benefits in the prevention and treatment of certain diseases. These diets are appropriate for all stages of the life cycle, including pregnancy, lactation, infancy, childhood, adolescence, older adulthood, and for athletes.	Narrative review
NHMRC (Australian government)	NHMRC, 2012[c]	To prevent iron deficiency, iron-containing nutritious foods are recommended to be the first foods. Iron-containing foods include iron-fortified cereals, as well as puréed meat and poultry dishes. Cooked plain tofu and legumes/beans are also sources of iron. Care needs to be taken particularly with a plant-based diet to ensure that supplies of iron are adequate. This is an important issue because of the neurocognitive development implications.	Narrative review

New Zealand Ministry of Health	Ministry of Health, 2012[d]	Dark-green leafy vegetables, puréed or mashed lentils, chickpeas, and peas are suitable alternatives for vegetarian infants, although the iron is less well absorbed and should be eaten with a source of vitamin C.	Narrative review
		(For vegetarian and vegan infants and toddlers): Toddlers should be offered a variety of nutritious foods from each of the major food groups each day. The food groups are vegetables and fruit; breads and cereals, preferably wholemeal; milk and milk products or suitable alternatives; vegetarian protein foods, such as pulses (peas, beans, lentils, soy), grains (wheat, oats, rice, barley, buckwheat, millet, pasta, bread), nuts (not whole), meat substitutes, eggs, and nut butters.	Narrative review
		(For vegetarian and vegan infants and toddlers): Once an infant has started complementary foods, the variety should be increased to ensure an additional intake of nutrients, especially energy, protein, iron, calcium, and vitamin B12.	Narrative review
		Dark-green leafy vegetables, sieved lentils, chickpeas, and peas are suitable alternatives to increase zinc intake for vegetarian infants.	Narrative review
		For vegetarian and vegan toddlers, provide plenty of liquids each day, as water, breast milk, cow milk, or plant-based milks only (and no more than 500 mL of milk per day).	Narrative review
		If the infant is not breastfed, then an infant formula should be used until the infant is 1 year of age. For vegan infants who are not breastfed or are partially breastfed, the use of a commercial soy-based infant formula during the first 2 years of life is recommended.	Narrative review
		For toddlers who do not have cow milk or milk products, calcium-fortified milk alternatives can provide calcium. Foods that can be used include mashed canned fish with bones (e.g., sardines and salmon), tofu, nut pastes, green vegetables (e.g., broccoli, leeks, cabbage and spinach), and cooked dried beans.	Narrative review

continued

TABLE B-12 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
CPS	Amit et al., 2010 (reaffirmed in 2018)	A well-balanced vegetarian diet as a healthy lifestyle choice is an acceptable option to provide for the needs of growth and development in the young.	Narrative review[e]
		Both lacto-ovo-vegetarian and vegan diets have increased iron needs (1.8-fold) compared with omnivores, and caregivers will require sound knowledge of food sources that are iron fortified or rich in iron. Iron supplementation may be required during periods of rapid growth.	Narrative review[e]
		Calcium intake in strict vegans needs careful attention to assure recommended consumption of fortified foods or supplements.	Narrative review[e]
		Energy needs in strict vegans may require intake of calorie-dense foods to provide for adequate growth. Growth should be monitored closely.	Narrative review[f]
		Foods containing the precursor of the essential fatty acid linolenic acid should be included in strict vegan diets (flaxseed, canola, nut oils, and soya products).	Narrative review[g]
		Infants, children, and adolescents on vegan diets should ensure adequate intake of vitamin B12–fortified food or be provided with 5 µg to 10 µg of daily supplement.	Narrative review[b]
		Lacto-ovo-vegetarian diets should be adequate to meet all nutrient needs comparable with omnivores (standard recommendations regarding supplementation).	Narrative review[e]

CPS (continued)	Amit et al., 2010 (reaffirmed in 2018)	Protein requirements in strict vegans will need to be increased to account for the lower digestibility of plant protein.	Narrative review[i]
		Vitamin D recommendations for infants in Canada are standard. Children and adolescents who consume less than 500 mL of vitamin D–fortified milk product per day should be supplemented with 400 U daily. For children younger than 2 years of age living above a northern latitude of 55°, those with dark skin, and those avoiding sunlight, 800 U of vitamin D per day should be provided in the winter months.	Narrative review[e]
		Zinc needs for breastfed infants of vegan mothers will require fortified foods after 7 months of age. Strict vegans will need to consume 50% more zinc to account for bioavailability.	Narrative review[e]
AAP	Bhatia et al., 2008	In term infants, although isolated soy protein–based formulas may be used to provide nutrition for normal growth and development, there are few indications for their use in place of cow milk–based formula. These indications include (a) for infants with galactosemia and hereditary lactase deficiency (rare), and (b) in situations in which a vegetarian diet is preferred.	Narrative review[j]
		Isolated soy protein–based formula has no advantage over cow milk protein-based formula as a supplement for the breastfed infant, unless the infant has one of the indications noted previously—(a) for infants with galactosemia and hereditary lactase deficiency (rare), and (b) in situations in which a vegetarian diet is preferred).	Narrative review[j]

continued

TABLE B-12 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
WHO	WHO, 2005	Feed a variety of foods to ensure that nutrient needs are met. Meat, poultry, fish, or eggs should be eaten daily, or as often as possible, because they are rich sources of many key nutrients such as iron and zinc. Milk products are rich sources of calcium and several other nutrients. Diets that do not contain animal-source foods (meat, poultry, fish, or eggs, plus milk products) cannot meet all nutrient needs at this age unless fortified products or nutrient supplements are used.[k]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Feed a variety of foods to ensure that nutrient needs are met. Meat, poultry, fish, or eggs should be eaten daily, or as often as possible. Vegetarian diets cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used.… Vitamin A–rich fruits and vegetables should be eaten daily. Provide diets with adequate fat content.… Avoid giving drinks with low nutrient value, such as tea, coffee, and sugary drinks such as soda. Limit the amount of juice offered so as to avoid displacing more nutrient-rich foods.[l]	Technical consultations and documents

NOTE: µg = microgram; AAP = American Academy of Pediatrics; AND = Academy of Nutrition and Dietetics; CPS = Canadian Paediatric Society; DGA = *Dietary Guidelines for Americans*; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; n-3 LCPUFA = omega-3 long-chain polyunsaturated fatty acid; NHMRC = National Health and Medical Research Council; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; WHO = World Health Organization.

[a] Lott et al. (2019) was an expert panel report with representation from the Academy of Nutrition and Dietetics, the American Academy of Pediatric Dentistry, the American Academy of Pediatrics, and the American Heart Association.

[b] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[c] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[d] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[e] Using the Canadian Task Force on Preventive Health Care system, the strength-of-evidence rating related to this recommendation was BII. A rating with the letter B indicates "fair evidence from well-designed case controlled and cohort studies."

[f] Using the Canadian Task Force on Preventive Health Care system, the strength-of-evidence rating related to this recommendation was CII. A rating with the letter C indicates "existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making."

[g] Using the Canadian Task Force on Preventive Health Care system, the strength-of-evidence rating related to this recommendation was BIII. A rating with the letter B indicates "fair evidence from well-designed case controlled and cohort studies."

[h] No rating was given for this recommendation.

[i] Using the Canadian Task Force on Preventive Health Care system, the strength-of-evidence rating related to this recommendation was CIII. A rating with the letter C indicates "existing evidence is conflicting and does not allow to make a recommendation for or against use of the clinical preventive action; however, other factors may influence decision-making."

[j] Guideline document included references related to soy protein–based formulas and infant growth and development. No references were provided for the portion of the recommendation related to galactosemia or vegetarian diets.

[k] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 12, Copyright (2005).

[l] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

TABLE B-13 Recommendations Related to Foods Associated with Food Allergy and Celiac Disease

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
AAP	Greer et al., 2019	No conclusions can be made about the role of any duration of breastfeeding in either preventing or delaying the onset of specific food allergies.	Narrative review
		The new recommendations for the prevention of peanut allergy are based largely on the LEAP trial and are endorsed by AAP. An expert panel has advised peanut introduction as early as 4–6 months of age for infants at high risk for peanut allergy (presence of severe eczema and/or egg allergy). The recommendations contain details of implementation for high-risk infants, including appropriate use of testing (specific IgE measurement, skin-prick test, and oral food challenges) and introduction of peanut-containing foods in the health care provider's office versus the home setting, as well as amount and frequency. For infants with mild to moderate eczema, the panel recommended introduction of peanut-containing foods at around 6 months of age, and for infants at low risk for peanut allergy (no eczema or any food allergy), the panel recommended introduction of peanut-containing food when age appropriate and depending on family preferences and cultural practices (i.e., after 6 months of age if exclusively breastfeeding).	Togias et al., 2017
		There are no short- or long-term advantages for exclusive breastfeeding beyond 3–4 months for prevention of atopic disease.	Narrative review
		There is lack of evidence that partially or extensively hydrolyzed formula prevents atopic disease in infants and children, even in those at high risk for allergic disease.	Narrative review
		There is no evidence that delaying the introduction of allergenic foods, including peanuts, eggs, and fish, beyond 4–6 months prevents atopic disease.	Narrative review
		There is now evidence that the early introduction of infant-safe forms of peanuts reduces the risk for peanut allergies. Data are less clear for timing of introduction of eggs.	Narrative review

CPS	Abrams et al., 2019	Allergenic foods should be introduced one at a time, to gauge reaction, without unnecessary delay between each new food.	Could not be mapped
		For high-risk infants, and based on developmental readiness, consider introducing common allergenic solids at around 6 months of age, but not before an infant is 4 months of age.	Narrative review
		For infants at no or low risk for food allergy, introducing complementary foods at about 6 months is recommended.	Could not be mapped
		If an infant appears to be tolerating a common allergenic food, advise parents to offer it a few times per week to maintain tolerance. If an adverse reaction is observed, advise parents to consult with a primary care provider about next steps.	Could not be mapped
RCPCH	RCPCH, 2019	Key messages for health professionals: All infants require solid foods from 6 months for adequate nutrition. Solid food should never be introduced before 4 months (17 weeks) as this is associated with increased short-term risk of infection and later risk of obesity, allergy, and CD.	Narrative review
SACN	SACN, 2018	Advice on complementary feeding should state that foods containing peanut and hen egg can be introduced from around 6 months of age and need not be differentiated from other solid foods. The deliberate exclusion of peanut or hen egg beyond 6–12 months of age may increase the risk of allergy to the same foods. Once introduced, and where tolerated, these foods should be part of an infant's usual diet, to suit both the individual child and family. If initial exposure is not continued as part of an infant's usual diet, then this may increase the risk of sensitization and subsequent food allergy. Families of infants with a history of early-onset eczema or suspected food allergy may wish to seek medical advice before introducing these foods.	Narrative review

continued

TABLE B-13 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
SACN; COT	SACN and COT, 2018	Advice on complementary feeding should state that foods containing peanut and hen egg need not be differentiated from other complementary foods. Complementary foods should be introduced in age-appropriate form from around 6 months of age, alongside continued breastfeeding, at a time and in a manner to suit both the family and individual child.	Systematic review;[a] BRAFO methodology
		Families of infants with a history of early-onset eczema or suspected food allergy may wish to seek medical advice before introducing these foods.	Systematic review;[a] BRAFO methodology
		The deliberate exclusion of peanut or hen egg beyond 6–12 months of age may increase the risk of allergy to the same foods. Once introduced, and where tolerated, these foods should be part of the infant's usual diet, to suit both the individual child and family. If initial exposure is not continued as part of the infant's usual diet, then this may increase the risk of sensitization and subsequent food allergy.	Systematic review;[a] BRAFO methodology
ESPGHAN	Fewtrell et al., 2017	Allergenic foods may be introduced when complementary food is commenced any time after 4 months (17 weeks).[b]	Systematic literature search
		Gluten may be introduced between 4 and 12 months of age. Consumption of large quantities of gluten should be avoided during the first weeks after gluten introduction and also during infancy.[b]	Systematic literature search
		Infants at high risk of peanut allergy (those with severe eczema, egg allergy, or both as defined in the LEAP study) should have peanut introduced (e.g., as smooth peanut butter) between 4 and 11 months, following evaluation by an appropriately trained professional.[b]	Systematic literature search

NIH/NIAID[c]	Togias et al., 2017	The [Expert Panel] recommends that infants with severe eczema, egg allergy, or both have introduction of age-appropriate peanut-containing food as early as 4–6 months of age to reduce the risk of peanut allergy. Other solid foods should be introduced before peanut-containing foods to show that the infant is developmentally ready. The [Expert Panel] recommends that evaluation with peanut-specific IgE (peanut sIgE) measurement, SPTs, or both be strongly considered before introduction of peanut to determine if peanut should be introduced and, if so, the preferred method of introduction.	Balance of benefits and harms; LEAP Trial;[a] expert opinion
		The [Expert Panel] suggests that infants with mild-to-moderate eczema should have introduction of age-appropriate peanut-containing food around 6 months of age, in accordance with family preferences and cultural practices, to reduce the risk of peanut allergy. Other solid foods should be introduced before peanut-containing foods to show that the infant is developmentally ready. The [Expert Panel] recommends that infants in this category may have dietary peanut introduced at home without an in-office evaluation. However, the [Expert Panel] recognizes that some caregivers and health care providers may desire an in-office supervised feeding, evaluation, or both.	LEAP Trial;[d] balance of benefits and harms; expert opinion; Enquiring About Tolerance Trial[e]
		The [Expert Panel] suggests that infants without eczema or any food allergy have age-appropriate peanut-containing foods freely introduced in the diet together with other solid foods and in accordance with family preferences and cultural practices.	Balance of benefits and harms; expert opinion[d]

continued

TABLE B-13 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
RWJF-HER	Pérez-Escamilla et al., 2017	Ask your child's doctor if you are considering using hydrolyzed or "hypoallergenic" infant formulas as these formulas have not been found to help prevent food allergies in infants.	American Academy of Allergy, Asthma & Immunology (2015)[f] and Australasian Society of Clinical Immunology and Allergy (2016)[g]
		If the biological parent has allergies to any food items, talk to your child's doctor about any precautions you need to take regarding the introduction of common allergenic food items (such as products with peanuts, eggs, dairy, or wheat) to your infant.	
		Introduce common allergenic food items to your baby after other solid food has been fed and tolerated, and with the first taste being at home. If no reaction occurs, then you can gradually increase the amount at a rate of one new food every 3 to 5 days.	
		You can introduce common allergenic food items to your baby when she or he is ready to eat solid food (usually between 4 and 6 months of age). These food items include dairy products such as yogurt or cow milk protein formula, eggs, soy, wheat, peanut butter, fish, and shellfish.	
ESPGHAN	Szajewska et al., 2016	Gluten can be introduced into the infant's diet between the ages of 4 and 12 completed months. The age of gluten introduction in infants in this age range does not seem to influence the absolute risk of developing CDA or CD during childhood.	Systematic review[h]
		Introducing gluten while the infant is being breastfed cannot be recommended as a means of reducing the risk of developing CD. Breastfeeding should, however, be promoted for its other well-established health benefits.	Systematic review[h]
		Neither the optimal amounts of gluten to be introduced at weaning nor the effects of different wheat preparations on the risks of developing CD and CDA have been established. Despite the limited evidence regarding the exact amounts and with no RCTs to support it, ESPGHAN suggests that consumption of large amounts of gluten should be discouraged during the first months after gluten introduction.	Systematic review[h]

		No recommendation can be made regarding the type of gluten to be used at introduction.	Systematic review[h]
		No recommendation was made on gluten introduction in children from families with first-degree relatives with CD.	Systematic review
		Recommendations on breastfeeding should not be modified because of considerations regarding prevention of CD.	Systematic review[h]
SIGENP; SIAIP	Alvisi et al., 2015[i]	It is not advisable to delay the introduction of potentially allergenic foods, nor of gluten with the purpose of preventing the development of allergic diseases; there is no ideal timing for gluten introduction in relation with the onset of CD and T1DM.	Narrative review

NOTE: AAP = American Academy of Pediatrics; BRAFO = Benefit-Risk Analysis for Foods; CD = celiac disease; CDA = celiac disease autoimmunity; COT = Committee on Toxicity of Chemicals in Food, Consumer Products, and the Environment; CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; IgE = immunoglobulin E; LEAP = Learning Early About Peanut Allergy; NIAID = National Institute of Allergy and Infectious Diseases; NIH = National Institutes of Health; RCPCH = Royal College of Paediatrics and Child Health; RCT = randomized controlled trial; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory-Committee on Nutrition; SIAIP = Italian Society of Pediatric Allergology and Immunology; SIGENP = Italian Society of Gastroenterology, Hepatology and Pediatric Nutrition; SPT = skin prick test; T1DM = type 1 diabetes mellitus.

[a] Using GRADE, the strength of the evidence for the recommendation was rated as Moderate ("further research is likely to have an effect on the quality of the body of evidence and may cthe hange the recommendation").

[b] Recommendation was noted as being relevant to European infants, "typically in relatively affluent populations with access to clean water and good healthcare."

[c] For Togias et al. (2017), the National Institute of Allergy and Infectious Diseases convened a coordinating committee with members representing 25 professional organization, along with a 26-member expert panel.

[d] Using GRADE, the strength of the evidence for the recommendation was rated as Low ("further research is very likely to have an important effect on the body of evidence and is likely to change the recommendation").

[e] Perkin et al., 2016.

[f] AAAAI, 2015.

[g] ASCIA, 2016.

[h] Using GRADE, this was rated as a "conditional recommendation." The strength of a recommendation was graded as strong when the evidence showed that the benefit of the intervention clearly outweighed the undesirable effects. The strength of a recommendation was graded as conditional when the trade-offs were less certain.

[i] Alvisi et al., 2015, is licensed under CC BY 4.0 (http://creativecommons.org/licenses/by/4.0).

TABLE B-14 Recommendations Related to Iron and Iron-Fortified Formula

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
CPS	Unger et al., 2019	For the healthy term infant, iron-rich complementary foods, such as meat, meat alternatives, and iron-fortified infant cereals, should be introduced at about 6 months. Access to traditional iron-rich foods should be encouraged and facilitated in indigenous communities. In populations with higher risk for IDA, case-selecting infants for testing may be one approach to assess the benefit from receiving supplementation with oral iron drops before 6 months. If an infant is developmentally ready, introducing iron-rich complementary foods between 4 and 6 months could also be considered when there is high risk for IDA.	Narrative review
		If normal birth weight infants are not breastfed, they should receive formula containing 6.5 mg/L to 13 mg/L of iron (which is the typical concentration in standard cow milk–based formulas in Canada) for the first 9–12 months. Formula-fed infants who may be at higher risk for iron deficiency (e.g., owing to low socioeconomic status; maternal anemia; low intake of iron-rich complementary foods; or living in an indigenous community that may be challenged by poverty, food insecurity, high consumption of evaporated milk or cow milk, and a high burden of *H. pylori* infection) should receive formula with a higher iron content (13 mg/L of iron).[a]	Narrative review
		There is insufficient evidence to recommend routine iron supplementation or laboratory screening for iron deficiency in healthy term infants with no risk factors who are exclusively breastfed for 6 months.	Narrative review
EFSA	EFSA Panel on Nutrition et al., 2019	Infants at risk of iron depletion (exclusively breastfed infants born to mothers with low iron status, or with early umbilical cord clamping [< 1 min after birth], or born preterm, or born small for gestational age or with high growth velocity) may benefit from introduction of complementary foods that are a source of iron before 6 months of age.[b]	Systematic review

ABM	Taylor and ABM, 2018	Iron supplementation to the 4-month-old, full-term, exclusively breastfed infant is associated with improved hematological indices. However, the long-term benefit of improved hematologic indices at 4–6 months is not known. If iron supplementation is given before 6 months, it should be given as a 1 mg/kg/day distinct iron supplement until iron-fortified cereals (7–7.5 mg ferrous sulfate/day) or other iron-rich foods such as meat, tofu, beans, and others are initiated at 6 months of age with other complementary foods.	Review of evidence[c,d]
ESPGHAN	Hojsak et al., 2018	Based on available evidence there is no necessity for the routine use of [young child formula] in children from 1 to 3 years of life, but they can be used as part of a strategy to increase the intake of iron, vitamin D, and n-3 PUFAs and decrease the intake of protein compared to unfortified cow milk. Follow-on formula can be used for the same purpose.	Systematic literature review
SACN	SACN, 2018	A wide range of solid foods, including iron-containing foods, should be introduced in an age-appropriate form from around 6 months of age, alongside continued breastfeeding, at a time and in a manner to suit both the family and individual child.	Narrative review
		Healthy infants do not require iron supplements. To optimize iron status throughout the first year of life, SACN and NICE recommendations on delayed cord clamping should be implemented and monitored.	Narrative review
ESPGHAN	Fewtrell et al., 2017	All infants should receive iron-rich complementary foods including meat products and/or iron-fortified foods. The strategy used will depend on the population, cultural factors, and available foods but can include iron-fortified foods or infant formulas, foods naturally rich in iron such as meat, or iron supplements.[e]	Systematic literature search
		Vegan diets should only be used under appropriate medical or dietetic supervision to ensure that the infant receives a sufficient supply of vitamin B12, vitamin D, iron, zinc, folate, n-3 LCPUFA, protein, and calcium, and that the diet is sufficiently nutrient and energy dense. Parents should understand the serious consequences of failing to follow advice regarding supplementation of the diet.[e]	Systematic literature search

continued

TABLE B-14 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
RWJF-HER	Pérez-Escamilla et al., 2017	After introducing iron- and zinc-fortified baby cereals or mashed meats, there is no particular order to follow for introducing solid food. At this point, your baby is able to digest and absorb the nutrients from healthy food belonging to different food groups. However, it is important to keep in mind that the earlier vegetables are introduced (once your baby is ready to consume solid food), the more she or he is likely to easily accept them.	Narrative review
		Exclusively breastfed babies need to get started on solid foods that are rich in iron and zinc sometime between 4 and 6 months, because by that time breast milk does not provide enough of these nutrients. Iron-zinc fortified baby cereals or puréed/mashed meats are recommended as first solid foods for exclusively breastfed babies.	Narrative review
		If you are not feeding your baby breast milk, iron-fortified formula is the next best choice to satisfy your baby's nutritional needs during the first 6 months of life. Do not feed low-iron formulas (those that have less than 6.7 milligrams of iron per liter) to your baby.	Narrative review
		(For 6–12 months): If you choose to formula feed, it is recommended that you give your baby formula fortified with iron and zinc.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2015	Recommend meat, meat alternatives, and iron-fortified cereal as an infant's first complementary foods.[f]	Narrative review
		Continue to recommend a variety of iron-rich foods. Ensure that foods such as meat and meat alternatives and iron-fortified cereal are offered a few times each day.[f]	Narrative review
		Recommend iron-rich meat, meat alternatives, and iron-fortified cereal as the first complementary foods. Encourage parents and caregivers to progress to introduce a variety of nutritious foods from the family meals.[f]	Narrative review
AAFP	AAFP, 2014	Breastfeeding with appropriate complementary foods, including iron-rich foods, should continue through at least the first year.	An AAP statement[g]

ESPGHAN	Domellöf et al., 2014	Follow-on formulas should be iron fortified; however, there is not enough evidence to determine the optimal iron concentration in follow-on formula.[h]	Narrative review
		Formula-fed infants up to 6 months of age should receive iron-fortified infant formula, with an iron content of 4 to 8 mg/L.[h]	Narrative review
		From the age of 6 months, all infants and toddlers should receive iron-rich (complementary) foods, including meat products and/or iron-fortified foods.[h]	Narrative review
		There is no need for general iron supplementation of healthy European infants and toddlers of normal birth weight.[h]	Narrative review
CPS	Grueger et al., 2013 (reaffirmed 2018)	Advise mothers to introduce iron-fortified foods in the form of meat, fish, or iron-fortified cereals as first foods, to avoid iron deficiency.	Narrative review
AAP	AAP Section on Breastfeeding, 2012	Complementary foods rich in iron and other micronutrients should be introduced at about 6 months of age.	Could not be mapped
NHMRC (Australian government)	NHMRC, 2012[i]	Encourage exclusive breastfeeding for around 6 months. There is no particular order that is advised for the introduction of solid foods or rate that new foods can be introduced, other than first foods should be nutritious and iron rich.	Systematic review[j]
		Foods can be introduced in any order provided iron-rich nutritious foods are included and the texture is suitable for the infant's stage of development. Cow milk products including full-fat yogurt, cheese, and custard may be given, but not cow milk as a main drink before 12 months.	Systematic review; narrative review[k]
		To prevent iron deficiency, iron-containing nutritious foods are recommended to be the first foods. Iron-containing foods include iron-fortified cereals, puréed meat, and poultry dishes. Cooked plain tofu and legumes/beans are also sources of iron. Care needs to be taken particularly with a plant-based diet to ensure that supplies of iron are adequate. This is an important issue because of the neurocognitive development implications.	Narrative review
		Use cow milk–based formulas until 12 months of age. (Note: All infant formulas available in Australia are iron fortified.)	Systematic review

continued

TABLE B-14 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
New Zealand Ministry of Health	Ministry of Health, 2012[l]	Dark-green leafy vegetables, puréed or mashed lentils, chickpeas, and peas are suitable alternatives for vegetarian infants, although the iron is less well absorbed and should be eaten with a source of vitamin C.	Narrative review
		(For vegetarian and vegan infants and toddlers): Once an infant has started complementary foods, the variety should be increased to ensure an additional intake of nutrients, especially energy, protein, iron, calcium, and vitamin B12.	Narrative review
		Increase the texture, variety, flavor, and amount of food offered so the infant receives an additional intake of nutrients, especially iron and vitamin C, and is eating some family foods by around 1 year of age.	Narrative review
		Infants and toddlers may need iron supplements under certain circumstances, for example, if an infant is diagnosed with iron deficiency or has been exclusively breastfed for a prolonged period.	Narrative review
		The variety of complementary foods should be increased to ensure an additional intake of nutrients, especially iron. Iron-fortified infant cereals are suitable starter foods, and absorption can be enhanced if the infant is also given foods containing vitamin C. Once the infant is around 6 months of age, meat or chicken purées can be added to their feeds, and as they develop chewing skills finely chopped meats can be introduced. Infants should be eating some family foods by around 1 year of age.	Narrative review
AAP	Baker et al., 2010	Exclusively breastfed infants are at increasing risk of iron deficiency after 4 completed months of age. Therefore, at 4 months of age, breastfed infants should be supplemented with 1 mg/kg per day of oral iron beginning at 4 months of age until appropriate iron-containing complementary foods (including iron-fortified cereals) are introduced in the diet.	Friel et al., 2003

		For formula-fed infants, the iron needs for the first 12 months of life can be met by a standard infant formula (iron content: 10–12 mg/L) and the introduction of iron-containing complementary foods after 4–6 months of age, including iron-fortified cereals. Whole milk should not be used before 12 completed months of age.	Narrative review
		For partially breastfed infants, the proportion of human milk versus formula is uncertain; therefore, beginning at 4 months of age, partially breastfed infants (more than half of their daily feedings as human milk) who are not receiving iron-containing complementary foods should also receive 1 mg/kg per day of supplemental iron.	Narrative review
		The iron intake between 6 and 12 months of age should be 11 mg/day. When infants are given complementary foods, red meat and vegetables with higher iron content should be introduced early. To augment the iron supply, liquid iron supplements are appropriate if iron needs are not being met by the intake of formula and complementary foods.	Iron DRIs[m]
		Toddlers 1 through 3 years of age should have an iron intake of 7 mg/day. This would be best delivered by eating red meats, cereals fortified with iron, vegetables that contain iron, and fruits with vitamin C, which augments the absorption of iron. For toddlers not receiving this iron intake, liquid supplements are suitable for children 12 through 36 months of age, and chewable multivitamins can be used for children 3 years and older.	Iron DRIs[m]
CPS	Amit et al., 2010 (reaffirmed in 2018)	Both lacto-ovo-vegetarian and vegan diets have increased iron needs (1.8-fold) compared with omnivores, and caregivers will require sound knowledge of food sources that are iron fortified or rich in iron. Iron supplementation may be required during periods of rapid growth.	Narrative review[n]

continued

TABLE B-14 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
WHO	WHO, 2005	As needed, use fortified foods or vitamin-mineral supplements (preferably mixed with or fed with food) that contain iron (8–10 mg/d at 6–12 months, 5–7 mg/d at 12–24 months). If adequate amounts of animal-source foods are not consumed, these fortified foods or supplements should also contain other micronutrients, particularly zinc, calcium, and vitamin B12.[o]	A background document and narrative review
		Feed a variety of foods to ensure that nutrient needs are met. Meat, poultry, fish, or eggs should be eaten daily, or as often as possible, because they are rich sources of many key nutrients such as iron and zinc. Milk products are rich sources of calcium and several other nutrients. Diets that do not contain animal-source foods (meat, poultry, fish, or eggs, plus milk products) cannot meet all nutrient needs at this age unless fortified products or nutrient supplements are used.[p]	A background document and narrative review

NOTE: AAFP = American Academy of Family Physicians; AAP = American Academy of Pediatrics; ABM = Academy of Breastfeeding Medicine; CPS = Canadian Paediatric Society; DRI = Dietary Reference Intake; EFSA = European Food Safety Authority; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; HC = Health Canada; IDA = iron deficiency anemia; mg/d = milligrams per day; mg/kg = milligrams per kilogram; mg/L = milligrams per liter; n-3 LCPUFA = omega-3 long-chain polyunsaturated fatty acid; n-3 PUFA = omega-3 polyunsaturated fatty acid; NHMRC = National Health and Medical Research Council; NICE = National Institute for Health and Care Excellence; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition; WHO = World Health Organization.

[a] All dosage recommendations were noted as referring to elemental iron.

[b] Document includes a strength-of-evidence rating for each question related to introduction of complementary foods and health outcomes (e.g., age of introduction of fish and odds of developing asthma-like symptom); the conclusion statements were not accompanied by a rating of strength.

[c] Using the National Guideline Clearinghouse system, the level-of-evidence rating related to this recommendation was IB ("evidence from at least one randomized controlled trial").

[d] Statements of the evidence are accompanied by a level-of-evidence rating. It is unclear, however, if it is based on a systematic or narrative review.

[e] Recommendations were noted as being relevant to European infants, "typically in relatively affluent populations with access to clean water and good healthcare."

[f] © All rights reserved. *Nutrition for healthy term infants: Recommendations from birth to six months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[g] AAP Section on Breastfeeding, 2012.

[h] Recommendations were noted as being relevant to Europe and other regions with a low general prevalence of iron deficiency anemia.

[i] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[j] Using the NHMRC system, the strength-of-evidence ratings related to this recommendation were as follows: Grade C (for breastfeeding and asthma and atopy) and Grade D (introduction of solid foods and allergy). No grade could be mapped to the portion of the recommendation related to iron. Grade C (suggestive association) indicates that the body of evidence provides some support for the recommendations but care should be taken in its application. Grade D indicates that the body of evidence is weak and any recommendation must be applied with caution.

[k] Portions of this recommendation could be mapped to a systematic review prepared for this guideline document; other portions appeared to be related to a narrative review of the evidence. Using the NHMRC system, the strength-of-evidence rating related to this recommendation was Grade D (risk associated with cow milk). No grade could be mapped to the portion of the recommendation related to iron. Grade D indicates that the body of evidence is weak and any recommendation must be applied with caution.

[l] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[m] Citation pertains to the first sentence. Evidence could not be mapped for the remainder of the recommendation.

[n] Using the Canadian Task Force on Preventive Health Care system, the strength-of-evidence rating related to this recommendation was BII. A rating with the letter B indicates "fair evidence from well-designed case controlled and cohort studies."

[o] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Use of Vitamin-Mineral Supplements or Fortified Products, p. 18, Copyright (2005).

[p] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 12, Copyright (2005).

TABLE B-15 Recommendations Related to Vitamin D

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
ABM	Taylor and ABM, 2018	The breastfeeding infant should receive vitamin D supplementation shortly after birth in doses of 10–20 µg/day (400–800 IU/day).	Review of evidence[a,b]
		The breastfeeding infant should receive vitamin D supplementation shortly after birth.... This supplement should be cholecalciferol, vitamin D3, because of superior absorption unless a vegetable source such as ergocaliferol vitamin D2, is desired.	Review of evidence[b,c]
SACN	SACN, 2018	All infants from birth to 1 year of age who are being exclusively or partially breastfed should be given a daily supplement containing 8.5 to 10 µg of vitamin D (340–400 IU/d). Infants who are fed infant formula should not be given a vitamin D supplement unless they are consuming less than 500 mL (about 1 pint) of infant formula per day, as infant formula is fortified with vitamin D.	Narrative review
RWJF-HER	Pérez-Escamilla et al., 2017	It is recommended that exclusively breastfed infants receive a daily supplement of vitamin D (400 IU), because this vitamin is low in breast milk. Infant formulas are fortified with vitamin D. However, if your baby consumes less than 1 liter per day of formula, your doctor may advise a vitamin D supplement for your baby.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2015	Recommend a daily vitamin D supplement of 10 µg (400 IU) for breastfed infants.[d,e]	Narrative review
	Health Canada et al., 2014	Recommend a daily vitamin D supplement of 10 µg (400 IU) for infants and young children who are breastfed or receiving breast milk.[f,g]	Narrative review
AAP	Golden et al., 2014	Because human milk contains inadequate amounts of vitamin D (unless the lactating mother is taking supplements of approximately 6,000 IU/d), breastfed and partially breastfed infants should be supplemented with 400 IU of vitamin D per day beginning in the first few days of life and continued until the infant has been weaned and is drinking at least 1 L/day of vitamin D–fortified infant formula or cow milk.	Vitamin D DRIs

ESPGHAN	Braegger et al., 2013	All infants should receive an oral supplementation of 400 IU/day of vitamin D. The implementation should be ensured and supervised by pediatricians and other health care professionals.	Narrative review
		For children in risk groups identified above, oral supplementation of vitamin D must be considered beyond 1 year of age.[h]	Narrative review
CPS	Grueger et al., 2013 (reaffirmed 2018)	Support exclusive breastfeeding, with vitamin D supplementation, for the first 6 months of life.	Narrative review
New Zealand Ministry of Health	Ministry of Health, 2013	Infants who are exclusively or partially breastfed (who receive less than 500 mL of formula per day, based on current NRVs; NHMRC 2006) and have one or more of the risk factors above may benefit from vitamin D supplementation.[i]	Narrative review
		It would be reasonable to wait until breastfeeding is well established in full-term, high-risk infants, such as until 6 weeks of age, before introducing vitamin D supplementation.	Narrative review
	Ministry of Health, 2012[j]	Evidence does not support the routine use of vitamin D supplements for breastfed infants in New Zealand. However, pregnant or breastfeeding women, and infants and toddlers at risk for vitamin D deficiency, may need a vitamin D supplement taken with the supervision of a health practitioner.	Narrative review
		Vitamin D supplements may be required by infants of vitamin D–deficient mothers and toddlers at risk of vitamin D deficiency.	Narrative review
CPS	Amit et al., 2010 (reaffirmed in 2018)	Vitamin D recommendations for infants in Canada are standard. Children and adolescents who consume less than 500 mL of a vitamin D–fortified milk product per day should be supplemented with 400 U daily. For children younger than 2 years of age living above a northern latitude of 55°, those with dark skin and those avoiding sunlight, 800 U of vitamin D per day should be provided in the winter months.	Narrative review[k]
	Godel et al., 2007 (reaffirmed in 2017)	Subsequent vitamin D dosage should be 400 IU/day for all infants during the fi year, with an increase to 800 IU/day from all sources between October and April north of the 55th parallel (approximate latitude of Edmonton) and between the 40th and 55th parallel in individuals with risk factors for vitamin D defi other than latitude alone.	Narrative review[l]

continued

TABLE B-15 Continued

NOTE: µg = micrograms; AAP = American Academy of Pediatrics; ABM = Academy of Breastfeeding Medicine; CPS = Canadian Paediatric Society; HC = Health Canada; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; IU = international units; L/d = liters per day; mL = milliliter; NHMRC = National Health and Medical Research Council; NRV = nutrient reference value; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition.

[a] Using the National Guideline Clearinghouse system, the level-of-evidence rating related to this recommendation was IB ("evidence from at least one randomised controlled trial").

[b] Statements of the evidence are accompanied by a level-of-evidence rating. It is unclear, however, if it is based on a systematic or narrative review.

[c] Using the National Guideline Clearinghouse system, the level-of-evidence rating related to this recommendation was IIA ("evidence from at least one controlled study without randomization").

[d] © All rights reserved. *Nutrition for healthy term infants: Recommendations from birth to six Months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[e] Recommendation is applicable to infants birth to 6 months of age.

[f] © All rights reserved. *Nutrition for healthy term infants: Recommendations from six to 24 months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[g] Recommendation is applicable to infants 6–12 months and young children 12–24 months.

[h] The risk groups were identified as breastfed infants not adhering to the present recommendation of vitamin D supplementation, children and adolescents with dark skin living in northern countries, children and adolescents without adequate sun exposure (excessive use of sunscreen with high SPF, staying indoors for much of the day, wearing clothes covering most of the skin, living in northern latitudes during wintertime), and obese children.

[i] Infants at higher risk of vitamin D deficiency were identified as breastfed infants with one or more of the following: a naturally dark skin, a sibling diagnosed with rickets or hypocalcaemic seizures, a mother who is deficient in vitamin D or is at a higher risk of becoming deficient, all preterm infants with a body weight less than 2.5 kilograms, and infants who are breastfed over winter months in New Zealand.

[j] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[k] Using the Canadian Task Force on Preventive Health Care system, the strength-of-evidence rating related to this recommendation was BII. A rating with the letter B indicates "fair evidence from well-designed case controlled and cohort studies."

[l] Using the Canadian Task Force on Preventive Health Care system, the strength-of-evidence rating related to this recommendation was Grade B. A rating with the letter B indicates "fair evidence from well-designed case controlled and cohort studies."

TABLE B-16 Recommendations Related to Iodine

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
New Zealand Ministry of Health	Ministry of Health, 2012[a]	For toddlers, prepare foods or choose pre-prepared foods, drinks and snacks that … are low in salt, but if using salt, use iodized salt.[b]	Narrative review
		Gradually introduce foods containing iodine. In September 2009 mandatory iodine fortification of bread, will over time, help to address the suboptimal iodine status of New Zealanders, including pregnant and breastfeeding mothers.	Narrative review
		If required, iodine supplementation for infants and toddlers should be managed by a medical practitioner. Kelp tablets are not recommended.	Narrative review
		If salt is added when family food is cooked, use small amounts of iodized salt. Rock salt and sea salt have negligible levels of iodine, so unless iodized they are not recommended.	Narrative review
		Introduce foods containing iodine, such as fish and seafood, meat and poultry, eggs, milk and milk products, seameal custard, and bread gradually into infants' and toddlers' diets. Prioritize these foods for infants who are exclusively breastfed.	Narrative review
WHO	WHO Secretariat et al., 2007	Pregnant and lactating women have no need for iodine supplements, nor do children aged 0–24 months require them. Indeed, the amount of iodine stored in the thyroid of a child at birth, when added to the iodine intake from the mother's breast milk, is likely to be sufficient to meet a child's need for iodine for the first 6 months of life and even up to 24 months of age.	Could not be mapped

NOTE: WHO = World Health Organization.

[a] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[b] This recommendation contained additional guidance unrelated to iodine that has been omitted from this table.

TABLE B-17 Recommendations Related to Supplementation[a]

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
ABM	Taylor and ABM, 2018	Zinc supplementation, above dietary intake, to the lactating mother or breastfeeding infant is not associated with improved outcomes and, therefore, is not recommended.	Review of evidence[b,c]
RWJF-HER	Pérez-Escamilla et al., 2017	Multivitamins are not needed if your child is eating a healthy nutritious diet. If your doctor or health care provider recommends giving multivitamins to your child, choose brands that are low in sugar.	Narrative review
USPSTF	Moyer, 2014[d]	USPSTF recommends that primary care clinicians prescribe oral fluoride supplementation starting at age 6 months for children whose water supply is deficient in fluoride.	Systematic review[e]
NHMRC (Australian government)	NHMRC, 2012[f]	Fluoride supplementation is not recommended.	CDC recommendation[g]
New Zealand Ministry of Health	Ministry of Health, 2012[h]	Infants and toddlers generally do not require supplements. A healthy well-balanced diet is the best way to provide nutrients for the body.	Narrative review
		Selenium supplements are recommended only under specialized nutritional and medical advice.	Narrative review
WHO	WHO, 2005	As needed, use fortified foods or vitamin-mineral supplements (preferably mixed with or fed with food) that contain iron (8–10 mg/day at 6–12 months, 5–7 mg/day at 12–24 months). If adequate amounts of animal-source foods are not consumed, these fortified foods or supplements should also contain other micronutrients, particularly zinc, calcium, and vitamin B12.[i]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Vegetarian diets cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used.[j]	Technical consultations and documents
		Use fortified complementary foods or vitamin-mineral supplements for the infant, as needed.[k]	Technical consultations and documents

NOTE: ABM = Academy of Breastfeeding Medicine; CDC = Centers for Disease Control and Prevention; mg/d = milligrams per day; NHMRC = National Health and Medical Research Council; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; USPSTF = U.S. Preventive Services Task Force; WHO = World Health Organization.

[a] This table omits recommendations that only pertain to iron, iodine, or vitamin D supplementation. Those recommendations are found in their respective tables above. This table also omits recommendations specific to vegetarian or vegan diets. Those recommendations are found in Table B-12, Recommendations Related to Vegetarian and Vegan Diets.

[b] Using the National Guideline Clearinghouse system, the level-of-evidence rating related to this recommendation was IB ("evidence from at least one randomised controlled trial").

[c] Statements of the evidence are accompanied by a level-of-evidence rating. It is unclear, however, if it is based on a systematic or narrative review.

[d] At the time of abstraction, this guideline was in the process of being updated.

[e] Using the USPSTF grading system, this recommendation was graded as B, meaning "The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial."

[f] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativcommons.org.au).

[g] CDC, 2001.

[h] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[i] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Use of Vitamin-Mineral Supplements or Fortified Products, p. 18, Copyright (2005).

[j] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

[k] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Use of Vitamin-Mineral Supplements or Fortified Products for Infant and Mother, p. 25, Copyright (2003).

TABLE B-18 Recommendations Related to Dietary Fat[a]

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
RWJF-HER	Pérez-Escamilla et al., 2017	Offering a variety of vegetables and fruits and avoiding food of limited nutritional value, such as those high in calories, sugar, salt, and fat (e.g., french fries, sugary cereals, cookies) helps your child gain a healthy amount of weight.	Narrative review
		It is important to introduce your baby to a large variety of vegetables and fruits prepared in different healthy ways and textures before she or he turns 1 year old. This will expose your baby to an array of flavors and textures that will make it easier for her or him to accept and learn to like healthy food from all the food groups (fruits, vegetables, whole grains, dairy, and protein). Your baby will also learn to self-control the desire for unhealthy food that has excessive amounts of added sugars, sodium (salt), saturated fat, and calories.	Narrative review
		Offer your toddler deboned fish such as salmon, white tuna, and trout. Fish is a good source of healthy fats known as omega-3s that are very important for brain development.	Narrative review
		Choose food for your toddler prepared with healthy oils, such as olive, canola, corn, or sunflower oil.	Narrative review
		Read food labels and the list of ingredients when choosing already prepared food for your toddler. Avoid food that has high amounts of any type of added sugars, including high-fructose corn syrup (e.g., SSBs like Kool-Aid, sodas, sports drinks) or sodium (e.g., packaged macaroni and cheese) or that contains any amount of trans fats (e.g., french fries).	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Explain to parents and caregivers that nutritious, higher-fat foods are an important source of energy for young children.[b]	Narrative review

NHMRC (Australian government)	NHMRC, 2012[c]	Consumption of nutrient-poor discretionary foods with high levels of saturated fat, added sugars, and/or added salt (e.g., cakes, biscuits, and potato chips) should be avoided.	Systematic reviews[d]
New Zealand Ministry of Health	Ministry of Health, 2012[e]	Use margarine derived from polyunsaturated plant oils as a spread, and margarine and reduced-fat milk in baking.	Narrative review
CPS	Amit et al., 2010 (reaffirmed in 2018)	Foods containing the precursor of the essential fatty acid linolenic acid should be included in strict vegan diets (flaxseed, canola, nut oils, and soya products).	Narrative review[f]
WHO	WHO, 2005	Feed a variety of foods to ensure that nutrient needs are met. Provide diets with adequate fat content. If animal-source foods are not consumed regularly, 10–20 g of added fats or oils are needed unless a fat-rich food is given (such as foods or pastes made from groundnuts, other nuts, and seeds). If animal-source foods are consumed, up to 5 g of additional fats or oils may be needed.[g]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Provide diets with adequate fat content.[h]	Technical consultations and documents

NOTE: CPS = Canadian Paediatric Society; HC = Health Canada; NHMRC = National Health and Medical Research Council; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SSB = sugar-sweetened beverage; WHO = World Health Organization.

[a] This table omits recommendations related to milk fat. Those recommendations are found in Table B-7, Recommendations Related to Milk and Milk-Based Products.

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[c] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[d] The systematic reviews were only related to sugar and salt. Using the NHMRC system, the strength-of-evidence ratings related to this recommendation were as follows: Grade A (for salt or sodium having an effect on blood pressure in children and adolescents) and Grade C (for sugar's effect on risk of dental disease). Grade A (convincing association) indicates that the body of evidence can be trusted to guide practice. Grade C (suggestive association) indicates that the body of evidence provides some support for the recommendations but care should be taken in its application.

[e] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[f] Using the Canadian Task Force on Preventive Health Care system, the strength-of-evidence rating related to this recommendation was BIII. A rating with the letter B indicates "fair evidence from well-designed case controlled and cohort studies."

[g] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Nutrient Content of Foods, p. 12, Copyright (2005).

[h] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Nutrient Content of Complementary Foods, p. 22, Copyright (2003).

TABLE B-19 Recommendations Related to Bottle Use and Propping

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
AAP	Heyman et al., 2017	Toddlers should not be given juice from bottles or easily transportable covered cups that allow them to consume juice easily throughout the day. Toddlers should not be given juice at bedtime.	Narrative review
ESPGHAN	Fewtrell et al., 2017	By 12 months, infants should drink mainly from a cup or training cup rather than a bottle.[a]	Systematic literature search
RWJF-HER	Pérez-Escamilla et al., 2017	Be cautious about the volume of formula or expressed breast milk given at each feed. Studies have shown that bottle size matters. The bigger the bottle used, the more likely the baby will be to consume more than needed.	Narrative review
		Bottle feeding is strongly discouraged after 12 months. Try to wean your child from the bottle by the time she or he is 1 year old. Doing so will reduce the risk of dental cavities and other dental problems later on.	Narrative review
		Do not give a bottle or food to your baby as a reward for behaving the way you want. Only offer food in response to your baby's hunger signals.	Narrative review
		Do not force your baby to finish the bottle or continue eating from your breast, since this will interfere with the baby's natural ability for appetite control down the road.	Narrative review
		Do not put your toddler to sleep with a bottle or sippy cup. This can cause dental cavities and other oral health problems.	Narrative review
		It is not recommended to mix cereal with formula or breast milk in a bottle. There is no evidence that this helps babies sleep longer, and it could be a choking hazard.	Narrative review
		You should not put your baby to bed with a bottle. This practice can affect the health of the baby's teeth and is an example of nonresponsive feeding.	Narrative review

		Do not practice bottle propping (leaning the bottle against a pillow or other support at the stage when babies cannot hold the bottle on their own).	Narrative review
AAP; AAPD	AAPD, 2016	To decrease the risk of developing early childhood caries, AAPD encourages professional and at-home preventive measures that include avoiding frequent consumption of liquids and/or solid foods containing sugar, in particular … SSBs (e.g., juices, soft drinks, sports drinks, sweetened tea) in a baby bottle or no-spill training cup … baby bottle use after 12–18 months.[b]	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2015	Warn of the risk of choking if infants are left alone while feeding. Explain the dangers of propping a bottle.[c]	Narrative review
	Health Canada et al., 2014	For an older infant or young child who is not breastfed or receiving breast milk: Recommend avoiding prolonged bottle feeding and giving bottles at night.[d]	Narrative review
NHMRC (Australian government)	NHMRC, 2012[e]	As with breastfeeding, bottle feeding according to need is appropriate. It is important for parents to be aware that information on formula packages recommending certain amounts for various ages is a guide only and does not necessarily suit every infant.	Could not be mapped
		Put an infant to bed without a bottle or take the bottle away when the infant has finished feeding or before they fall asleep; do not let the infant keep sucking on the bottle.	Could not be mapped
		Avoid feeding an infant using a "propped" bottle.	Could not be mapped
		Avoid leaving an infant unattended with a bottle containing liquids (i.e., no bottle propping).	Could not be mapped

continued

TABLE B-19 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
New Zealand Ministry of Health	Ministry of Health, 2012[f]	Avoid leaving a feeding bottle in the mouth of a sleeping infant or using one as a pacifier.	2008 New Zealand Dental Association guide[g]
		Avoid nighttime and long-term use of infant bottles containing liquids other than water.	2008 New Zealand Dental Association guide[g]
		Fully ventilated bottles should be used when bottle feeding.	Narrative review
		Never leave an infant unattended and feeding from a bottle.	Narrative review
NICE	NICE, 2008	Oral Health. Health visitors, GPs, dentists, dental hygienists/assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should discourage parents and carers from adding sugar or any solid food to bottle feeds.	Rapid review,[h] UK Department of Health report[i]
		Oral Health. Health visitors, GPs, dentists, dental hygienists/assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should encourage parents and carers to discourage feeding from a bottle from 1 year onward.	Rapid review,[h] UK Department of Health report[i]
		Oral Health. Health visitors, GPs, dentists, dental hygienists/assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should encourage parents and carers to use a bottle for expressed breast milk, infant formula, or cooled boiled water only.	Rapid review,[h] UK Department of Health report[i]
New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	Advise parents to hold the baby while bottle feeding and not to put baby to bed with a bottle.	Could not be mapped
		If bottle feeding, advise parents to use only expressed breast milk or infant formula.	Could not be mapped
		Reinforce the message to hold the baby while bottle feeding and not to put the baby to bed with a bottle.	Could not be mapped

NOTE: AAP = American Academy of Pediatrics; AAPD = American Academy of Pediatric Dentistry; CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; GP = general practitioner; HC = Health Canada; NHMRC = National Health and Medical Research Council; NICE = National Institute for Health and Care Excellence; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SSB = sugar-sweetened beverage; UK = United Kingdom.

[a] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[b] This recommendation contained additional guidance unrelated to bottle use or bottle propping that has been omitted from this table.

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[e] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[f] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[g] New Zealand Dental Association, 2008.

[h] Each recommendation was associated with multiple evidence statements. Each evidence statement was taken from a review of effectiveness. Some of the evidence statements give a strength-of-evidence rating (++, +, –). There was no overall statement on the strength of the evidence for each recommendation.

[i] Department of Health, 1994.

TABLE B-20 Recommendations Related to Cup Use

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
RWJF-HER	Lott et al., 2019[a]	6–12 months: Offer a total of 1/2 to 1 cup (4–8 oz) per day of plain, fluoridated drinking water in a cup during mealtimes.	Narrative review
AAP	Heyman et al., 2017	Toddlers should not be given juice from bottles or easily transportable covered cups that allow them to consume juice easily throughout the day.	Narrative review
ESPGHAN	Fewtrell et al., 2017	By 12 months, infants should drink mainly from a cup or training cup rather than a bottle.[b]	Systematic literature search
RWJF-HER	Pérez-Escamilla et al., 2017	Between 6 and 12 months, it is recommended to transition infants from using a bottle to a cup.	Narrative review
		Do not put your toddler to sleep with a bottle or sippy cup. This can cause dental cavities and other oral health problems.[c]	Narrative review
		Give your toddler cow milk in a cup instead of a bottle.	Narrative review
		If you decide to offer 100% fruit juice to your toddler, limit intake to no more than 4 oz per day and offer it with a cup, not a bottle.	Narrative review
		Once your baby starts solid food, it is recommended to offer a total of 8 oz per day of plain drinking water in a cup. This will help your baby get familiar with the taste and to learn to like plain water.	Narrative review 4–
		Your toddler needs about 2 cups of water per day to cover her or his fluids needs. Use a cup to offer water.[c]	Narrative review
AAP; AAPD	AAPD, 2016	To decrease the risk of developing early childhood caries, AAPD encourages professional and at-home preventive measures that include avoiding frequent consumption of liquids and/or solid foods containing sugar, in particular … sugar-sweetened beverages (e.g., juices, soft drinks, sports drinks, sweetened tea) in a baby bottle or no-spill training cup.[d]	Narrative review

Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Encourage use of an open cup, initially with help.[e]	Narrative review
NHMRC (Australian government)	NHMRC, 2012[f]	A cup can be introduced at around 6 months, to teach infants the skill of sipping from a cup.	Narrative review
		Milk and other drinks should be offered in a cup rather than a feeding bottle.	Narrative review
New Zealand Ministry of Health	Ministry of Health, 2012[g]	If the mother is feeding expressed breast milk, suggest she tries using a cup and seeks advice from a health practitioner if she has questions about this method.	Narrative review
NICE	NICE, 2008	Oral Health. Health visitors, GPs, dentists, dental hygienists/assistants, community and day care nursery nurses, home-based child carers, and others who work with young children should encourage parents and carers to offer drinks in a nonvalved, free-fl cup from age 6 months to 1 year.	Rapid review,[h] UK Department of Health report[i]
New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	If not breastfeeding, expressed breast milk or formula can also be provided by cup feeding.[j]	Could not be mapped
		If a mother is temporarily unable to breastfeed, expressed breast milk can be given to the infant by cup feeding.	Could not be mapped
AHA	Gidding et al., 2005	Improving nutritional quality after weaning: Delay the introduction of 100% juice until at least 6 months of age and limit to no more than 4–6 oz/day; juice should only be fed from a cup.	Could not be mapped

NOTE: AAP = American Academy of Pediatrics; AAPD = American Academy of Pediatric Dentistry; AHA = American Heart Association; CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; GP = general practitioner; HC = Health Canada; NHMRC = National Health and Medical Research Council; NICE = National Institute for Health and Care Excellence; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; UK = United Kingdom.

[a] Lott et al. (2019) was an expert panel report with representation from Academy of Nutrition and Dietetics, the American Academy of Pediatric Dentistry, the American Academy of Pediatrics, and the American Heart Association.

continued

TABLE B-20 Continued

[b] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[c] Recommendation was noted as being applicable to children in the second year of life.

[d] This recommendation contained additional guidance unrelated to cup use that has been omitted from this table.

[e] *Nutrition for healthy term infants: Recommendations from six to 24 months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[f]

[g]

[h] Each recommendation was associated with multiple evidence statements. Each evidence statement was taken from a review of effectiveness. Some of the evidence statements give a strength-of-evidence rating (++, +, –). There is no overall statement on the strength of the evidence for each recommendation.

[i] Department of Health, 1994.

[j] Recommendation applicable to infants 6–12 months.

TABLE B-21 Recommendations Related to Safety of Foods and Feeding Practices

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
Pasteurized Juice, Milk, and Dairy Products			
RWJF-HER	Lott et al., 2019[a]	12–24 months: At 12 months of age, plain, pasteurized whole milk may be introduced. 2 to 3 cups per day (16–24 oz) whole milk is recommended until 2 years of age.	DGA, AAP, and a prior RWJF-HER expert panel
		1–5 years (12–60 months): Consume only plain, pasteurized milk; flavored milk is not recommended.	Federal CACFP nutrition standards, and the National Academies recommendation that only unflavored milk be permitted in the WIC food package
AAP	Heyman et al., 2017	Consumption of unpasteurized juice products should be strongly discouraged in infants, children, and adolescents.	Narrative review
RWJF-HER	Pérez-Escamilla et al., 2017	Do not offer your child unpasteurized juice, milk, or dairy products.	FoodSafety.gov
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Promote safe food preparation and storage to prevent foodborne illness. Recommend avoiding products that contain raw or undercooked meat, eggs, poultry, or fish; unpasteurized milk or milk products; unpasteurized juice; and cross-contamination between cooked and uncooked foods.[b]	Narrative review

continued

TABLE B-21 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
NHMRC (Australian government)	NHMRC, 2012[c]	Pasteurized full-cream milk may be introduced to a child's diet as a drink at around 12 months of age and be continued throughout the second year of life, and beyond. It is an excellent source of protein, calcium, and other nutrients. Do not use unpasteurized cow or goat milk.	Systematic review; narrative review; WHO European region report[d]
		Soy (except fortified soy products and soy formula where specifically indicated), and other nutritionally incomplete alternate milks or milk substitutes (e.g., goat milk, sheep milk, coconut milk, almond milk) are inappropriate alternatives to breast milk, formula, or pasteurized whole cow milk in the first 2 years of life.	Systematic review; narrative review[e]
Honey[f]			
RWJF-HER	Pérez-Escamilla et al., 2017	Honey should *not* be given to children under 12 months old because it may cause a serious condition known as botulism.	Narrative review
NHMRC (Australian government)	NHMRC, 2012[c]	To prevent botulism, do not feed honey to infants aged under 12 months.	Single journal article[g]
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Advise parents and caregivers not to give honey to a child under 1 year of age. This helps to prevent infant botulism.[b]	Narrative review
Consumption of Raw or Undercooked Foods			
SACN	SACN, 2018	A wide range of solid foods, including iron-containing foods, should be introduced in an age-appropriate form* from around 6 months of age, alongside continued breastfeeding, at a time and in a manner to suit both the family and individual child. *Infants and young children should never be left alone while they are eating. Children under 5 years old must not be given whole nuts, as they can choke on them.	Narrative review

			Infants, children, pregnant women, and elderly people can safely eat raw or lightly cooked eggs that are produced under the British Lion Code of Practice. The revised advice (updated October 2017), based on the latest scientific evidence, means that people vulnerable to infection or who are likely to suffer serious symptoms from food poisoning (such as infants, children, pregnant women, and elderly people) can now safely eat raw or lightly cooked hen eggs or foods containing them. The existing advice on UK non-Lion eggs has not changed; nonhen eggs and eggs from outside the United Kingdom should always be cooked thoroughly for vulnerable groups. Eggs from other birds, such as duck, goose, and quail eggs, should always be cooked thoroughly.	
SACN; COT	SACN and COT, 2018	Advice on complementary feeding should state that foods containing peanut and hen egg need not be differentiated from other complementary foods. Complementary foods should be introduced in age-appropriate* form from around 6 months of age, alongside continued breastfeeding, at a time and in a manner to suit both the family and individual child. *Infants and young children should never be left alone while they are eating. Children under 5 years old must not be given whole nuts, as they can choke on them. Currently it is advised that infants and young children should not eat raw eggs, eggs with runny yolks, or any food that contains raw eggs and is uncooked or only lightly cooked. These can cause food poisoning and serious illness although this advice is currently under review as a result of the ACMSF recommendations (ACMSF, 2016). Eggs from other birds such as duck, goose, and quail eggs should always be cooked thoroughly, and this will not change following the current review.	Systematic review;[h] BRAFO methodology
RWJF-HER	Pérez-Escamilla et al., 2017	Do not offer your child undercooked meats, poultry, eggs (e.g., runny eggs), or seafood.	Narrative review

continued

TABLE B-21 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Promote safe food preparation and storage to prevent foodborne illness. Recommend avoiding products that contain raw or undercooked meat, eggs, poultry, or fish; unpasteurized milk or milk products; unpasteurized juice; and cross-contamination between cooked and uncooked foods.[b]	Narrative review
NHMRC (Australian government)	NHMRC, 2012[c]	To prevent salmonella poisoning, cook all eggs thoroughly (i.e., until the white is completely set and yolk begins to thicken) and do not use uncooked products containing raw eggs such as homemade ice cream or mayonnaise.	Could not be mapped
Choking			
CPS	Abrams et al., 2019	The texture or size of any complementary food should be age appropriate to prevent choking. For young infants, smooth peanut butter can be diluted with water or mixed with a previously tolerated puréed fruit or vegetable, or with breast milk (HealthLinkBC, 2017; Togias et al., 2017). For older infants, smooth peanut butter can be spread lightly on a piece of thin toast crust, or a peanut puff product could be offered (Togias et al., 2017).	Narrative review
SACN	SACN, 2018	A wide range of solid foods, including iron-containing foods, should be introduced in an age-appropriate form* from around 6 months of age, alongside continued breastfeeding, at a time and in a manner to suit both the family and individual child. *Infants and young children should never be left alone while they are eating. Children under 5 years old must not be given whole nuts, as they can choke on them.[i]	Narrative review
SACN; COT	SACN and COT, 2018	Advice on complementary feeding should state that foods containing peanut and hen egg need not be differentiated from other complementary foods. Complementary foods should be introduced in age-appropriate* form from around 6 months of age, alongside continued breastfeeding, at a time and in a manner to suit both the family and individual child.	Systematic review;[h] BRAFO methodology

		*Infants and young children should never be left alone while they are eating. Children under 5 years old must not be given whole nuts, as they can choke on them.[i]	
RWJF-HER	Pérez-Escamilla et al., 2017	It is not recommended to mix cereal with formula or breast milk in a bottle. There is no evidence that this helps babies sleep longer, and it could be a choking hazard.	Narrative review
		Supervise your child during feeding time, and avoid offering food items that are a choking hazard such as nuts, grapes, popcorn, hot dogs, and hard candies.	Narrative review
		If you offer fish to your toddler, which is strongly recommended, make sure it is completely deboned.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2015	Warn of the risk of choking if infants are left alone while feeding. Explain the dangers of propping up a bottle.[j]	Narrative review
	Health Canada et al., 2014	Recommend parents and caregivers avoid offering hard, small, and round, or smooth and sticky, solid foods. These may cause aspiration and choking.[b]	Narrative review
NHMRC (Australian government)	NHMRC, 2012	Avoid whole nuts and other hard foods to reduce the risk of choking.	UK Food Standards recommendations
		Hard, small, round, and/or sticky solid foods are not recommended because they can cause choking and aspiration.	Could not be mapped
New Zealand Ministry of Health	Ministry of Health, 2012[k]	Be aware of foods that are more likely to cause choking.[l]	Narrative review
		Offer toddlers a variety of nutritious foods from each of the major food groups each day. The food groups are vegetables and fruit; breads and cereals, including wholemeal; milk and milk products or suitable alternatives; lean meat, poultry, seafood, eggs, legumes, nuts, and seeds.* *Do not give small, hard foods like whole nuts and large seeds until children are at least 5 years old.	Narrative review
New Zealand Dental Association; New Zealand Ministry of Health	New Zealand Dental Association, 2008	Discuss healthy eating and remind parents to choose nutritious and tooth-friendly snacks.* *Any whole pieces of food can cause children to choke. Do not give small, hard foods such as whole nuts until children are at least 5 years old. Altering food texture may be helpful, such as grating, cooking, mashing, or puréeing foods.[i]	Could not be mapped

continued

TABLE B-21 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
WHO	WHO, 2005	Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. Infants can eat puréed, mashed, and semisolid foods beginning at 6 months. By 8 months most infants can also eat finger foods (snacks that can be eaten by children alone). By 12 months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods). Avoid foods in a form that may cause choking (i.e., items that have a shape and/or consistency that may cause them to become lodged in the trachea, such as whole nuts, whole grapes, or raw carrots, whole or in pieces).[m]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. Infants can eat puréed, mashed, and semisolid foods beginning at 6 months. By 8 months most infants can also eat finger foods (snacks that can be eaten by children alone). By 12 months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods). Avoid foods that may cause choking (i.e., items that have a shape and/or consistency that may cause them to become lodged in the trachea, such as nuts, grapes, and raw carrots).[n]	Technical consultations and documents
Supervision			
SACN	SACN, 2018	A wide range of solid foods, including iron-containing foods, should be introduced in an age-appropriate form* from around 6 months of age, alongside continued breastfeeding, at a time and in a manner to suit both the family and individual child. *Infants and young children should never be left alone while they are eating. Children under 5 years old must not be given whole nuts, as they can choke on them.[o]	Narrative review

SACN; COT	SACN and COT, 2018	Advice on complementary feeding should state that foods containing peanut and hen egg need not be differentiated from other complementary foods. Complementary foods should be introduced in age-appropriate* form from around 6 months of age, alongside continued breastfeeding, at a time and in a manner to suit both the family and individual child. *Infants and young children should never be left alone while they are eating. Children under 5 years old must not be given whole nuts, as they can choke on them.[o]	Systematic review;[s] BRAFO methodology
RWJF-HER	Pérez-Escamilla et al., 2017	Supervise your child during feeding time, and avoid offering food items that are a choking hazard such as nuts, grapes, popcorn, hot dogs, and hard candies.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2015	Warn of the risk of choking if infants are left alone while feeding. Explain the dangers of propping a bottle.[j]	Narrative review
	Health Canada et al., 2014	Recommend infants and young children always be supervised during feeding.[b]	Narrative review
NHMRC (Australian government)	NHMRC, 2012	Avoid leaving an infant unattended with a bottle containing liquids (i.e., no bottle propping).	Could not be mapped
		Ensure that infants and toddlers are always supervised during feeding.	Could not be mapped
New Zealand Ministry of Health	Ministry of Health, 2012[k]	Never leave an infant unattended and feeding from a bottle.	Narrative review
NICE	NICE, 2008	Child Health Promotion: Health visitors and the CHPP team should advise parents and carers not to leave infants alone when they are eating or drinking.	Rapid review,[p] UK Department of Health report[q]

NOTE: AAP = American Academy of Pediatrics; BRAFO = Benefit-Risk Analysis for Foods; CACFP = Child and Adult Care Food Program; CHPP = Child Health Promotion Programme; COT = Committee on Toxicity of Chemicals in Food, Consumer Products, and the Environment; CPS = Canadian Paediatric Society; DGA = *Dietary Guidelines for Americans*; HC = Health Canada; NHMRC = National Health and Medical Research Council; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientifi Advisory Committee on Nutrition; UK = United Kingdom; WHO = World Health Organization; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

continued

TABLE B-21 Continued

[a] Lott et al. (2019) was an expert panel report with representation from Academy of Nutrition and Dietetics, the American Academy of Pediatric Dentistry, the American Academy of Pediatrics, and the American Heart Association.

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[c] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[d] Portions of this recommendation could be mapped to a systematic review prepared for this guideline document; other portions appeared to be related to a narrative review of the evidence and a WHO report (Michaelsen et al., 2003). Using the NHMRC system, the strength-of-evidence rating related to this recommendation was Grade D (risk associated with cow milk). Grade D indicates that the body of evidence is weak and any recommendation must be applied with caution. There was insufficient evidence to provide an evidence statement on unpasteurized cow or goat milk.

[e] Portions of this recommendation could be mapped to a systematic review prepared for this guideline document; other portions appeared to be related to a narrative review of the evidence. There was insufficient evidence to provide an evidence statement on unpasteurized cow or goat milk.

[f] Recommendations related to avoiding or limiting honey generally or related to dental caries are presented in Table B-9, Recommendations Related to Substances to Limit or Avoid.

[g] Brook, 2007. The cited article is a narrative review on infant botulism.

[h] Using GRADE, the strength of the evidence for the recommendation was rated as Moderate ("further research is likely to have an effect on the quality of the body of evidence and may change the recommendation").

[i] Portions of this recommendation not related to the prevention of choking have been omitted.

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[k] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[l] A list of such foods is provided in the guideline document.

[m] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Food Consistency, p. 9, Copyright (2005).

[n] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Food Consistency, p. 20, Copyright (2003).

[o] Portions of this recommendation not related to supervision have been omitted.

[p] Each recommendation was associated with multiple evidence statements. Each evidence statement was taken from a review of effectiveness. Some of the evidence statements give a strength-of-evidence rating (++, +, –). There is no overall statement on the strength of the evidence for each recommendation.

[q] Department of Health, 1994.

TABLE B-22 Recommendations Related to Introduction of Complementary Foods (CFs)

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
CPS	Abrams et al., 2019	For infants at no or low risk for food allergy, introducing complementary foods at about 6 months is recommended.	Could not be mapped
EFSA	EFSA Panel on Nutrition et al., 2019	As long as the foods are given in an age-appropriate texture, are nutritionally appropriate, and prepared according to good hygiene practices, there is no convincing evidence that the introduction of CFs is associated with either adverse or beneficial health effects (except for infants at risk of iron depletion) at any age investigated in the included studies (< 1 months to < 6 months for earlier introduction).	Systematic review[a]
		For nutritional reasons, the majority of infants need CFs from around 6 months of age.	Systematic review[a]
		Infants at risk of iron depletion (exclusively breastfed infants born to mothers with low iron status, or with early umbilical cord clamping [< 1 min after birth], or born preterm, or born small for gestational age or with high growth velocity) may benefit from introduction of CFs that are a source of iron before 6 months of age.	Systematic review[a]
		The available data do not allow the determination of a single age for the introduction of CFs for infants living in Europe. The appropriate age range depends on the individual's characteristics and development, even more so if the infant were born preterm.	Systematic review[a]
		The fact that an infant may be ready from a neurodevelopmental point of view to progress from a liquid to a more diversified diet before 6 months of age does not imply that there is a need to introduce CFs.	Systematic review[a]
RCPCH	RCPCH, 2019	Key messages for health professionals: All infants require solid foods from 6 months on for adequate nutrition. Solid food should never be introduced before 4 months (17 weeks) as this is associated with increased short-term risk of infection and later risk of obesity, allergy, and celiac disease.	Narrative review

continued

TABLE B-22 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
SACN	SACN, 2018	A wide range of solid foods, including iron-containing foods, should be introduced in an age-appropriate form from around 6 months of age, alongside continued breastfeeding, at a time and in a manner to suit both the family and individual child.	Narrative review
		Current advice on the age of introduction of complementary feeding should remain unchanged. That is, most infants should not start solid foods until around the age of 6 months, having achieved developmental readiness.	Narrative review
		Dietary, flavor, and texture diversification should proceed incrementally throughout the complementary feeding period, taking into account the variability between infants in developmental attainment and the need to satisfy nutritional requirements. When introducing new foods it should be recognized that they may need to be presented to infants on many occasions before they are accepted, particularly as infants get older.	Narrative review
SACN; COT	SACN and COT, 2018	Complementary foods should be introduced in age-appropriate form from around 6 months of age, alongside continued breastfeeding, at a time and in a manner to suit both the family and individual child.	WHO report[b]
ESPGHAN	Fewtrell et al., 2017	Complementary foods (i.e., solid foods and liquids other than breast milk or infant formula) should not be introduced before 4 months but should not be delayed beyond 6 months.[c]	Systematic literature search

RWJF-HER	Pérez-Escamilla et al., 2017	After introducing iron- and zinc-fortified baby cereals or mashed meats, there is no particular order to follow for introducing solid food. At this point, your baby is able to digest and absorb the nutrients from healthy food belonging to different food groups. However, it is important to keep in mind that the earlier vegetables are introduced (once your baby is ready to consume solid food), the more she or he is likely to easily accept them.	Narrative review
		Exclusively breastfed babies need to get started on solid foods that are rich in iron and zinc sometime between 4 and 6 months, because by that time breast milk does not provide enough of these nutrients. Iron-zinc fortified baby cereals or puréed/mashed meats are recommended as first solid foods for exclusively breastfed babies.	Narrative review
		Infants should be fed only breast milk and/or formula for about 6 months. However, babies may be ready to be introduced to solid food between 4 and 6 months if they are able to sit with good head control and showing other signs of readiness.	Narrative review
		It is not recommended to introduce solid food before baby is 4 months old as the baby's body is not ready and this adds unnecessary calories to her or his diet.	Narrative review
		When introducing a new vegetable, it is recommended to mix it first with a familiar food such as breast milk, formula, or cereal. Combining new food items that are more difficult to accept by babies, such as some vegetables, with food they are already familiar with can help your baby accept and learn to like vegetables more readily.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2015	Recommend meat, meat alternatives, and iron-fortified cereal as an infant's first complementary foods.[d]	Narrative review

continued

TABLE B-22 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
SIGENP; SIAIP	Alvisi et al., 2015[e]	Solid introduction should privilege family, ethnic, and regional habits, considering the nutritional needs of every child.	Narrative review
		The age of introduction of solid foods should be defined individually, based on the competences acquired and on the interest of the infant towards food (to be assessed together with parents). The beginning of the introduction of solid foods at 6 months of age remains a desirable goal also in Western societies and for exclusively breastfed infants, although it would be advisable to introduce solid foods together with breast milk before such age. We would however suggest to introduce complementary foods not before 4 months of age and not after 6 months of age.	Narrative review
		A synthesis of baby-led weaning and traditional solid introduction, probably spontaneously adopted by many families, allows the child to benefi both from the positive implications of meal sharing and from a nutritionally adequate meal, with attention placed on the moment when the infant expresses her or his desire to experiment with new foods.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Recommend iron-rich meat, meat alternatives, and iron-fortified cereal as the first complementary foods. Encourage parents and caregivers to progress to introduce a variety of nutritious foods from the family meals.[f]	Narrative review
CPS	Grueger et al., 2013 (reaffirmed in 2018)	Advise slow, progressive, natural weaning whenever possible.	Narrative review
		Advise mothers to introduce iron-fortified foods in the form of meat, fish, or iron-fortified cereals as first foods, to avoid iron deficiency.	Narrative review
AAP	AAP Section on Breastfeeding, 2012	Complementary foods rich in iron and other micronutrients should be introduced at about 6 months of age.	Could not be mapped

NHMRC (Australian government)	NHMRC, 2012[g]	Encourage exclusive breastfeeding for around 6 months. There is no particular order that is advised for the introduction of solid foods or rate that new foods can be introduced, other than first foods should be nutritious and iron rich.	Systematic review[h]
		Foods can be introduced in any order provided iron-rich nutritious foods are the fi foods and the texture is suitable for the infant's stage of development. Cow milk products including full-fat yogurt, cheese, and custard may be given, but not cow milk as a main drink before 12 months.	Systematic review; narrative review[i]
		Introduce solid foods at around 6 months to meet the infant's increasing nutritional and developmental needs.	Systematic review[j]
New Zealand Ministry of Health	Ministry of Health, 2012[k]	Give only breast milk until the infant is ready for and needs extra food; this will be at around 6 months of age.	Narrative review
		After an infant is 6 months of age, the contribution of energy from complementary food increases. However, in the first year of life, most infants and toddlers still obtain most of their energy from breast milk (or infant formula if breast milk is unavailable).	Narrative review
		Increase the texture, variety, flavor, and amount of food offered so the infant receives an additional intake of nutrients, especially iron and vitamin C, and is eating some family foods by around 1 year of age.	Narrative review
		Introduce infants to new foods one at a time to allow the detection of reactions to individual components of foods. At first, a new food should be added only every 2 to 4 days.	Narrative review
		The variety of complementary foods should be increased to ensure an additional intake of nutrients, especially iron. Iron-fortifi infant cereals are suitable starter foods, and absorption can be enhanced if the infant is also given foods containing vitamin C. Once the infant is around 6 months of age, meat or chicken purées can be added to their feeds, and as they develop chewing skills fi chopped meats can be introduced. Infants should be eating some family foods by around 1 year of age.	Narrative review
		As sources of carbohydrate and dietary fiber, start infant with white or wholemeal bread.	Narrative review

continued

TABLE B-22 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
AAP	Baker et al., 2010	The iron intake between 6 and 12 months of age should be 11 mg/day. When infants are given complementary foods, red meat and vegetables with higher iron content should be introduced early. To augment the iron supply, liquid iron supplements are appropriate if iron needs are not being met by the intake of formula and complementary foods.	Iron DRIs[l]
WHO	WHO, 2005	Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. Infants can eat puréed, mashed, and semisolid foods beginning at 6 months. By 8 months most infants can also eat finger foods (snacks that can be eaten by children alone). By 12 months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods). Avoid foods in a form that may cause choking (i.e., items that have a shape and/or consistency that may cause them to become lodged in the trachea, such as whole nuts, whole grapes, or raw carrots, whole or in pieces).[m]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. Infants can eat puréed, mashed, and semisolid foods beginning at 6 months. By 8 months most infants can also eat finger foods (snacks that can be eaten by children alone). By 12 months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods). Avoid foods that may cause choking (i.e., items that have a shape and/or consistency that may cause them to become lodged in the trachea, such as nuts, grapes, and raw carrots).[n]	Technical consultations and documents

	Practice exclusive breastfeeding from birth to 6 months of age, and introduce complementary foods at 6 months of age (180 days) while continuing to breastfeed.[o]	Technical consultations and documents
	Start at 6 months of age with small amounts of food, and increase the quantity as the child gets older, while maintaining frequent breastfeeding.[p]	Technical consultations and documents

NOTE: AAP = American Academy of Pediatrics; BRAFO = Benefit-Risk Analysis for Foods; CF = complementary food; COT = Committee on Toxicity of Chemicals in Food, Consumer Products, and the Environment; CPS = Canadian Paediatric Society; EFSA = European Food Safety Authority; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; HC = Health Canada; NHMRC = National Health and Medical Research Council; PAHO = Pan American Health Organization; RCPCH = Royal College of Paediatrics and Child Health; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition; SIAIP = Italian Society of Pediatric Allergology and Immunology; SIGENP = Italian Society of Gastroenterology, Hepatology and Pediatric Nutrition; WHO = World Health Organization.

[a] Document includes strength-of-evidence rating for each question related to introduction of complementary foods and health outcomes (e.g., age of introduction of fish and odds of developing asthma-like symptom); the conclusion statements were not accompanied by a rating of strength.

[b] WHO, 2001.

[c] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[d] © All rights reserved. *Nutrition for healthy term infants: Recommendations from birth to six Months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[e] Alvisi et al., 2015, is licensed under CC BY 4.0 (http://creativecommons.org/licenses/by/4.0).

[f] © All rights reserved. *Nutrition for healthy term infants: Recommendations from six to 24 months*. Health Canada. Adapted and reproduced with permission from the Minister of Health, 2020.

[g] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[h] Using the NHMRC system, the strength-of-evidence ratings related to this recommendation were as follows: Grade C (for breastfeeding and asthma and atopy) and Grade D (introduction of solid foods and allergy). Grade C (suggestive association) indicates that the body of evidence provides some support for the recommendations but care should be taken in its application. Grade D indicates that the body of evidence is weak and any recommendation must be applied with caution.

[i] Portions of this recommendation could be mapped to a systematic review prepared for this guideline document; other portions appeared to be related to a narrative review of the evidence. Using the NHMRC system, the strength-of-evidence rating related to this recommendation was Grade D (risk associated with cow milk). Grade D indicates that the body of evidence is weak and any recommendation must be applied with caution.

continued

TABLE B-22 Continued

[j] Using the NHMRC system, the strength-of-evidence ratings related to this recommendation were as follows: Grade C (for overweight outcomes) and Grade D (introduction of solid foods and allergy). Grade C (suggestive association) indicates that the body of evidence provides some support for the recommendations but care should be taken in its application. Grade D indicates that the body of evidence is weak and any recommendation must be applied with caution.

[k] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[l] Citation pertains to the first sentence. Evidence could not be mapped for the remainder of the recommendation.

[m] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Food Consistency, p. 9, Copyright (2005).

[n] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Food Consistency, p. 20, Copyright (2003).

[o] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Duration of Exclusive Breastfeeding and Age of Introduction of Complementary Foods, p. 10, Copyright (2003).

[p] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Amount of Complementary Food Needed, p. 18, Copyright (2003).

TABLE B-23 Recommendations Related to Food Consistency and Texture

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
CPS	Abrams et al., 2019	The texture or size of any complementary food should be age-appropriate to prevent choking. For young infants, smooth peanut butter can be diluted with water or mixed with a previously tolerated puréed fruit or vegetable, or with breast milk (HealthLinkBC, 2017; Togias et al., 2017). For older infants, smooth peanut butter can be spread lightly on a piece of thin toast crust, or a peanut puff product could be offered (Togias et al., 2017).	Narrative review
SACN	SACN, 2018	Dietary, flavor, and texture diversification should proceed incrementally throughout the complementary feeding period, taking into account the variability between infants in developmental attainment and the need to satisfy nutritional requirements. When introducing new foods it should be recognized that they may need to be presented to infants on many occasions before they are accepted, particularly as infants get older.	Narrative review
ESPGHAN	Fewtrell et al., 2017	Foods should be of an appropriate texture and consistency for the infant's developmental stage, ensuring timely progression to finger foods and self-feeding. Prolonged use of puréed foods should be discouraged, and infants should be eating lumpy foods by 8–10 months at the latest. By 12 months, infants should drink mainly from a cup or training cup rather than a bottle.[a]	Systematic literature search
		Recommendations on specific types of complementary foods should take into consideration traditions and feeding patterns in the population. Infants should be offered a varied diet including foods with different flavors and textures including bitter-tasting green vegetables.[a]	Systematic literature search
RWJF-HER	Pérez-Escamilla et al., 2017	From around 6–12 months, your baby will progress from assisted feeding to self-feeding. During this time offer your baby food of different flavors and textures.	Narrative review

continued

TABLE B-23 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
RWJF-HER (continued)	Pérez-Escamilla et al., 2017	Eating habits are established early in life, so it is important that parents only offer healthy food to their babies. Offer your baby a variety of soft/cooked vegetables, fruits, and other healthy food with different flavors and textures so that she or he learns to like them.	Narrative review
SIGENP; SIAIP	Alvisi et al., 2015[b]	Offer ground, chopped, or finger food only once the child has developed the necessary postural and oral motor skills.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Ensure that lumpy textures are offered no later than 9 months. Encourage progress towards a variety of textures, modified from family foods, by 1 year of age.[c]	Narrative review
		Promote offering finger foods to encourage self-feeding.[c]	Narrative review
		Recommend iron-rich meat, meat alternatives, and iron-fortified cereal as the first complementary foods. Encourage parents and caregivers to progress to introduce a variety of nutritious foods from the family meals.[c]	Narrative review
NHMRC (Australian government)	NHMRC, 2012[d]	Ensure that solid foods are of appropriate texture. The texture of foods that are introduced should be suited to an infant's developmental stages, moving from puréed to lumpy to normal textures during the 6–12 month period.	Narrative review
		From 12 months of age and beyond, toddlers should be consuming family foods consistent with the *Australian Dietary Guidelines*.	Could not be mapped

New Zealand Ministry of Health	Ministry of Health, 2012[e]	The variety of complementary foods should be increased to ensure an additional intake of nutrients, especially zinc. At around 6 months of age, meat or chicken purées can be added. As chewing skills develop, finely chopped meats can be introduced. Infants should be eating family foods by around 1 year of age.	Narrative review
		Increase the texture, variety, flavor, and amount of food offered so the infant receives an additional intake of nutrients, especially iron and vitamin C, and is eating some family foods by around 1 year of age.	Narrative review
WHO	WHO, 2005	Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. Infants can eat puréed, mashed, and semisolid foods beginning at 6 months. By 8 months most infants can also eat finger foods (snacks that can be eaten by children alone). By 12 months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods). Avoid foods in a form that may cause choking (i.e., items that have a shape and/or consistency that may cause them to become lodged in the trachea, such as whole nuts, whole grapes, or raw carrots, whole or in pieces).[f]	A background document and narrative review
		Practice responsive feeding, applying the principles of psychosocial care. Specifically (a) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; (b) feed slowly and patiently, and encourage children to eat, but do not force them; (c) if children refuse many foods, experiment with different food combinations, tastes, textures, and methods of encouragement; (d) minimize distractions during meals if the child loses interest easily; (e) remember that feeding times are periods of learning and love—talk to children during feeding, with eye-to-eye contact.[g]	A background document and narrative review

continued

TABLE B-23 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
PAHO/WHO	PAHO/WHO, 2003	Gradually increase food consistency and variety as the infant gets older, adapting to the infant's requirements and abilities. Infants can eat puréed, mashed, and semisolid foods beginning at 6 months. By 8 months most infants can also eat finger foods (snacks that can be eaten by children alone). By 12 months, most children can eat the same types of foods as consumed by the rest of the family (keeping in mind the need for nutrient-dense foods). Avoid foods that may cause choking (i.e., items that have a shape and/or consistency that may cause them to become lodged in the trachea, such as nuts, grapes, and raw carrots).[h]	Technical consultations and documents
		Practice responsive feeding, applying the principles of psychosocial care (Engle et al., 2000; Pelto et al., 2003). Specifically (a) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; (b) feed slowly and patiently, and encourage children to eat, but do not force them; (c) if children refuse many foods, experiment with different food combinations, tastes, textures, and methods of encouragement; (d) minimize distractions during meals if the child loses interest easily; (e) remember that feeding times are periods of learning and love—talk to children during feeding, with eye-to-eye contact.[i]	Technical consultations and documents

NOTE: CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; HC = Health Canada; NHMRC = National Health and Medical Research Council; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientifi Advisory Committee on Nutrition; SIAIP = Italian Society of Pediatric Allergology and Immunology; SIGENP = Italian Society of Gastroenterology, Hepatology and Pediatric Nutrition; WHO = World Health Organization.

[a] Recommendation was noted as being relevant to European infants, "typically in relatively affluent populations with access to clean water and good healthcare."

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[d] NHMRC, 2012, is licensed under CC BY 4.0 Australia (https://creativecommons.org.au).

[e] Ministry of Health, 2012, is licensed under CC BY 4.0 International (http://creativecommons.org/licenses/by/4.0).

[f] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Food Consistency, p. 9, Copyright (2005).

[g] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Responsive Feeding, p. 22, Copyright (2005).

[h] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Food Consistency, p. 20, Copyright (2003).

[i] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Responsive Feeding, p. 14, Copyright (2003).

TABLE B-24 Recommendations Related to Meal Frequency

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
RWJF-HER	Pérez-Escamilla et al., 2017	Establish a consistent regular schedule for your baby's meals, snacks, and sleep times.	Narrative review
		Once your child is 1 year old, structure eating occasions—she or he needs to eat three meals and two to three healthy snacks at about the same time every day. Following a regular schedule will help your child learn when and what to expect to eat during the day.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Recommend a regular schedule of meals and snacks, offering a variety of foods from the four food groups.[a]	Narrative review; 2007 *Eating Well with Canada's Food Guide*[b]
		Recommend gradually increasing the number of times per day that complementary foods are offered while continuing to breastfeed.[a]	Narrative review
AHA	Gidding et al., 2005	Parent, guardian, and caregiver responsibilities for children's nutrition: Control when food is available and when it can be eaten (nutrient quality, portion size, snacking, regular meals).	Narrative review
WHO	WHO, 2005	For the average healthy infant, meals should be provided 4–5 times per day, with additional nutritious snacks (such as pieces of fruit or bread or chapatti with nut paste) offered 1–2 times per day, as desired. The appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding. If energy density or amount of food per meal is low, more frequent meals may be required.[c]	Based on theoretical estimates of the number of feedings required, calculated from energy requirements

PAHO/WHO	PAHO/WHO,	2003	Increase the number of times that the child is fed complementary foods as she or he gets older. The appropriate number of feedings depends on the energy density of the local foods and the usual amounts consumed at each feeding. For the average healthy breastfed infant, meals of complementary foods should be provided 2–3 times per day at 6–8 months of age and 3–4 times per day at 9–11 and 12–24 months of age. Additional nutritious snacks (such as a piece of fruit or bread or chapatti with nut paste) may be offered 1–2 times per day, as desired. Snacks are defi as foods eaten between meals—usually self-fed, convenient, and easy to prepare. If energy density or amount of food per meal is low, or the child is no longer breastfed, more frequent meals may be required.[d]	Technical consultations and documents

NOTE: AHA = American Heart Association; CPS = Canadian Paediatric Society; HC = Health Canada; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; WHO = World Health Organization.

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[b] Health Canada, 2007.

[c] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Meal Frequency and Energy Density, p. 10, Copyright (2005).

[d] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Meal Frequency and Energy Density, p. 21, Copyright (2003).

TABLE B-25 Recommendations Related to Hunger and Satiety Cues

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
ESPGHAN	Fewtrell et al., 2017	Parents should be encouraged to respond to their infant's hunger and satiety queues and to avoid feeding to comfort or as a reward.[a]	Systematic literature search
RWJF-HER	Pérez-Escamilla et al., 2017	Do not give a bottle or food to your baby as a reward for behaving the way you want. Only offer food in response to your baby's hunger signals.	Narrative review
		Do not force your baby to finish the bottle or continue eating from your breast, because this will interfere with the baby's natural ability for appetite control later in life.	Narrative review
		Do not pressure your toddler to finish her or his plate.	Narrative review
		During night awakenings, first give your baby an opportunity to self-soothe back to sleep before picking her or him up. If this does not work, before feeding try using other soothing strategies that work for your baby.	Narrative review
SIGENP; SIAIP	Alvisi et al., 2015[b]	The child's diet will be better inasmuch as the family will follow a correct and balanced diet, mindful of the caloric and protein intake. It is therefore of paramount importance to provide parents with the right information about a nutritionally balanced diet, and encourage them to recognize and respect every child's self-regulatory capacity. It is also important to promote the daily consumption of fruits and vegetables.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Encourage responsive feeding based on the child's hunger and satiety cues.[c]	Narrative review

AHA	Gidding et al., 2005	Improving nutritional quality after weaning: Respond to satiety clues and do not overfeed; infants and young children can usually self-regulate total caloric intake; do not force children to finish meals if not hungry as they often vary caloric intake from meal to meal.	Narrative review
WHO	WHO, 2005	Practice responsive feeding, applying the principles of psychosocial care. Specifically (a) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; (b) feed slowly and patiently, and encourage children to eat, but do not force them; (c) if children refuse many foods, experiment with different food combinations, tastes, textures, and methods of encouragement; (d) minimize distractions during meals if the child loses interest easily; (e) remember that feeding times are periods of learning and love—talk to children during feeding, with eye-to-eye contact.[d]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Practice responsive feeding, applying the principles of psychosocial care (Engle et al., 2000; Pelto et al., 2003). Specifically (a) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; (b) feed slowly and patiently, and encourage children to eat, but do not force them; (c) if children refuse many foods, experiment with different food combinations, tastes, textures, and methods of encouragement; (d) minimize distractions during meals if the child loses interest easily; (e) remember that feeding times are periods of learning and love—talk to children during feeding, with eye-to-eye contact.[e]	Technical consultations and documents

continued

TABLE B-25 Continued

NOTE: AHA = American Heart Association; CPS = Canadian Paediatric Society; ESPGHAN = European Society for Paediatric Gastroenterology, Hepatology and Nutrition; HC = Health Canada; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SIAIP = Italian Society of Pediatric Allergology and Immunology; SIGENP = Italian Society of Gastroenterology, Hepatology and Pediatric Nutrition; WHO = World Health Organization.

[a] Recommendation was noted as being relevant to European infants, typically in relatively affluent populations with access to clean water and good health care.

[b] Alvisi et al., 2015, is licensed under CC BY 4.0 (http://creativecommons.org/licenses/by/4.0).

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[d] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Responsive Feeding, p. 22, Copyright (2005).

[e] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Responsive Feeding, p. 14, Copyright (2003).

TABLE B-26 Recommendations Related to Responsive Feeding Practices

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
SACN	SACN, 2018	Dietary, flavor, and texture diversification should proceed incrementally throughout the complementary feeding period, taking into account the variability between infants in developmental attainment and the need to satisfy nutritional requirements. When introducing new foods it should be recognized that they may need to be presented to infants on many occasions before they are accepted, particularly as infants get older.	Narrative review
RWJF-HER	Pérez-Escamilla et al., 2017	Actively engage in conversations with your baby while feeding her or him and as you change routines throughout the day.	Narrative review
		Avoid distractions while feeding your baby, including using your smartphone.	Narrative review
		Do not give up if your baby does not accept the food the first time you offer it. Try again during a different eating occasion. It may take as many as 15 to 20 tries before your baby learns to like a new food.	Narrative review
		Provide healthy, tasty food that is appropriate for your child's age at regular times and in a pleasant environment, and let your baby decide how much she or he wants to eat.	Narrative review
		Remember that it may take more tries for your baby to learn to like vegetables than other healthy food like fruits. Continue offering a variety of vegetables and other healthy food, and let your child decide when she or he is ready.	Narrative review
SIGENP; SIAIP	Alvisi et al., 2015[a]	A synthesis of baby-led weaning and "traditional" solid introduction, probably spontaneously adopted by many families, allows the child to benefit both from the positive implications of meal sharing and from a nutritionally adequate meal, with attention placed on the moment when the infant expresses their desire to experiment new foods.	Narrative review

continued

TABLE B-26 Continued

Organization	Citation	Recommendation	Evidence Mapped to Recommendation
SIGENP; SIAIP (continued)	Alvisi et al., 2015[a]	It is recommended to encourage the sharing of mealtimes and the satisfaction of the infant's curiosity and requests with small tastings of food.	Narrative review
		Offer ground, chopped, or finger food only once the child has developed the necessary postural and oral motor skills.	Narrative review
		The child's diet will be better inasmuch as the family will follow a correct and balanced diet, mindful of the caloric and protein intake. It is therefore of paramount importance to provide parents with the right information about a nutritionally balanced diet, and encourage them to recognize and respect every child's self-regulatory capacity. It is also important to promote the daily consumption of fruits and vegetables.	Narrative review
Breastfeeding Committee for Canada; CPS; Dietitians of Canada; HC	Health Canada et al., 2014	Encourage parents and caregivers to be role models and instill lifelong healthy eating habits.[b]	Narrative review; 2007 *Eating Well with Canada's Food Guide*[c]
		Promote offering finger foods to encourage self-feeding.[b]	Narrative review
NHMRC (Australian government)	NHMRC, 2012[d]	As with breastfeeding, bottle feeding according to need is appropriate. It is important for parents to be aware that information on formula packages recommending certain amounts for various ages is a guide only and does not necessarily suit every infant.	Could not be mapped
NICE	NICE, 2008	Child health promotion: Health visitors and the CHPP team should encourage families to eat together and encourage parents and carers to set a good example by the food choices they make for themselves.	Rapid review,[e] UK Department of Health report[f]

AHA	Gidding et al., 2005	Parent, guardian, and caregiver responsibilities for children's nutrition: Control when food is available and when it can be eaten (nutrient quality, portion size, snacking, regular meals).	Narrative review
		Parent, guardian, and caregiver responsibilities for children's nutrition: Serve as role models and lead by example; do as I do rather than do as I say.	Narrative review
		Provide social context for eating behavior (family meals, role of food in social intercourse).	Narrative review
		Improving nutritional quality after weaning: Introduce healthy foods and continue offering if initially refused; do not introduce foods without overall nutritional value simply to provide calories.	Narrative review
WHO	WHO, 2005	Practice responsive feeding, applying the principles of psychosocial care. Specifically (a) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; (b) feed slowly and patiently, and encourage children to eat, but do not force them; (c) if children refuse many foods, experiment with different food combinations, tastes, textures, and methods of encouragement; (d) minimize distractions during meals if the child loses interest easily; (e) remember that feeding times are periods of learning and love—talk to children during feeding, with eye-to-eye contact.[g]	A background document and narrative review
PAHO/WHO	PAHO/WHO, 2003	Practice responsive feeding, applying the principles of psychosocial care (Engle et al., 2000; Pelto et al., 2003). Specifically (a) feed infants directly and assist older children when they feed themselves, being sensitive to their hunger and satiety cues; (b) feed slowly and patiently, and encourage children to eat, but do not force them; (c) if children refuse many foods, experiment with different food combinations, tastes, textures, and methods of encouragement; (d) minimize distractions during meals if the child loses interest easily; (e) remember that feeding times are periods of learning and love—talk to children during feeding, with eye-to-eye contact.[h]	Technical consultations and documents

continued

TABLE B-26 Continued

NOTE: AHA = American Heart Association; CHPP = Child Health Promotion Programme; CPS = Canadian Paediatric Society; HC = Health Canada; NHMRC = National Health and Medical Research Council; NICE = National Institute for Health and Care Excellence; PAHO = Pan American Health Organization; RWJF-HER = Robert Wood Johnson Foundation-Healthy Eating Research; SACN = Scientific Advisory Committee on Nutrition; SIAIP = Italian Society of Pediatric Allergology and Immunology; SIGENP = Italian Society of Gastroenterology, Hepatology and Pediatric Nutrition; UK = United Kingdom; WHO = World Health Organization.

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[e] Each recommendation was associated with multiple evidence statements. Each evidence statement was taken from a review of effectiveness. Some of the evidence statements give a strength-of-evidence rating (++, +, –). There is no overall statement on the strength of the evidence for each recommendation.

[f] Department of Health, 1994.

[g] Reprinted from *Guiding principles for feeding non-breastfed children 6–24 months of age*, World Health Organization, Responsive Feeding, p. 22, Copyright (2005).

[h] Reprinted from *Guiding principles for complementary feeding of the breastfed child*, Pan American Health Organization/World Health Organization, Responsive Feeding, p. 14, Copyright (2003).

Appendix C

Committee Member Biographical Sketches

Kathryn Dewey, Ph.D. (*Chair*), is a Distinguished Professor Emerita in the Department of Nutrition at the University of California, Davis. Her research focuses on maternal and child nutrition in both low-income and higher-income populations, particularly infant and young child feeding, growth during infancy and early childhood, micro- and macronutrient status of infants and young children, maternal nutrition during pregnancy and lactation, risk factors for early lactation difficulties, and the short- and long-term consequences of interventions to improve nutrition of mothers and their children. She has conducted clinical and community-based research in Bangladesh, Costa Rica, Ghana, Guatemala, Honduras, Malawi, Mexico, Peru, and the United States. Her professional service includes consultation for the World Health Organization (WHO), UNICEF, Pan American Health Organization, National Institutes of Health, and March of Dimes; scientific advisory committees for the Bill & Melinda Gates Foundation and the UK Medical Research Council; and serving as president of the Society for International Nutrition Research and of the International Society for Research on Human Milk and Lactation. She is currently a member of the Board of Directors for the Global Alliance for Improved Nutrition, the U.S. Food and Nutrition Board, the U.S. 2020 Dietary Guidelines Advisory Committee, the WHO Guidelines Development Group on Complementary Feeding, and several technical advisory groups. She has a Ph.D. in biological sciences from the University of Michigan.

Stephanie A. Atkinson, Ph.D., D.Sc. (Hon), is a professor and a nutrition clinician-scientist in the Department of Pediatrics at McMaster University

and McMaster Children's Hospital in Hamilton, Ontario. Her research focuses on investigations of the developmental origins of health and disease (DOHaD) designed to explore the environmental (nutrition), genetic, and biochemical factors during fetal, neonatal, and early childhood life that play a role in defining the offspring phenotype and as risk determinants for noncommunicable diseases such as obesity and osteoporosis. This includes conducting randomized clinical trials and epidemiological investigations in Canada and globally under the Canadian Institutes of Health Research–funded Healthy Life Trajectories Initiative (HeLTI) as well as leading the DOHaD birth cohort harmonization project ReACH. In knowledge translation activities, Dr. Atkinson has served as an expert advisor to many projects by Health Canada; the National Academies of Sciences, Engineering, and Medicine; the U.S. Food and Drug Administration; and the Office of Dietary Supplements of the National Institutes of Health that involved development of the Dietary Reference Intakes (DRIs), dietary guidelines for Canadians and Americans, and feeding practice guidelines for premature and term infants. Recent recognition honors include election as the president and also a fellow of the American Society of Nutrition; a fellow of the Canadian Academy of Health Sciences; a Doctorate of Science, *honoris causa*, from Western University; and the Khursheed Jeejeebhoy Award for Best Application of Clinical Nutrition Research to Clinical Practice from the Canadian Nutrition Society. Dr. Atkinson received her Ph.D. from the University of Toronto and completed postdoctoral training at The Hospital for Sick Children, Toronto.

Susan Baker, M.D., Ph.D., is a professor of pediatrics in the Department of Pediatrics in the Jacobs School of Medicine and Biomedical Sciences at the University at Buffalo. Her specialties includes hepatology, nutrition, pediatric gastroenterology, and pediatrics. Dr. Baker has been awarded the American Physiological Society's Distinction in Scholarship in Physiological Genomics award, the American Academy of Pediatrics' Murray Davidson Award, and the U.S. Food and Drug Administration's Pediatric Advisory Committee Recognition Award. She received her M.D. from the Temple University School of Medicine and her Ph.D. in human nutrition from the Massachusetts Institute of Technology. She completed a residency in pediatrics at Buffalo Children's Hospital and a fellowship in gastroenterology and nutrition at Boston Children's Hospital. One of her research focuses is nutrition support for infants and children. Dr. Baker was also appointed to and served on the editorial boards of *Pediatrics* and the *Journal of Pediatric Gastroenterology and Nutrition*.

Sara Benjamin-Neelon, Ph.D., J.D., M.P.H., R.D., is the Helaine and Sid Lerner Professor in Public Health Promotion and an associate professor

in the Department of Health, Behavior, and Society at Johns Hopkins University. Dr. Benjamin-Neelon is a child nutritionist trained in dietary intervention research and a licensed attorney. Her focus is on policy and environmental approaches to obesity and chronic disease prevention in vulnerable populations. Her studies target young children and women during pregnancy, with several focusing on early care and education. Her research takes place in India, Kenya, Mexico, the United Kingdom, and the United States. Dr. Benjamin-Neelon completed a Ph.D. and an M.P.H. at the University of North Carolina at Chapel Hill, a J.D. from the Mitchell Hamline School of Law, and a postdoctoral fellowship at Harvard Medical School. She is an Honorary Senior Visiting Fellow at the Centre for Diet and Activity Research at the University of Cambridge.

Lisa Bodnar, Ph.D., M.P.H., R.D., is the vice-chair of research and a professor of epidemiology at the University of Pittsburgh Graduate School of Public Health. Her research interests include maternal nutritional status and birth outcomes, nutritional epidemiology, and perinatal epidemiology. Her research goal is to discover the healthiest weight, nutrition, and behavioral practices to promote the health of pregnant women and their children. Dr. Bodnar has contributed to scientifically advancing our understanding of optimal weight gain recommendations during pregnancy, the reproductive consequences of maternal obesity, and the role of vitamin D deficiency in adverse birth outcomes. In addition, her research has been used in nine reports of the National Academies of Sciences, Engineering, and Medicine as well as key recommendations, practice guidelines, or action statements from national and international societies and agencies. She has contributed her experience to several national panels that set guidelines for nutrition during pregnancy, including the Institute of Medicine Committee to Reevaluate Pregnancy Weight Gain Guidelines. Dr. Bodnar received her Ph.D. in nutrition with an epidemiology minor from the University of North Carolina at Chapel Hill and shortly thereafter completed her postdoctoral fellowship in reproductive biology with the Magee-Women's Research Institute and the University of Pittsburgh School of Medicine.

Ronette Briefel, Dr.PH., R.D., is a senior fellow with Mathematica. Dr. Briefel is an expert in nutrition, public health, and population-based strategies to prevent disease and promote health. Her expertise covers childhood diet and obesity, food security, maternal and child health, and analysis of national survey data to study low-income and high-risk populations. Dr. Briefel has led national studies on the food consumption patterns and nutrient intakes of infants, toddlers, and preschoolers as reflected by the Feeding Infants and Toddlers Study; evaluations of interventions to reduce child food insecurity; and evidence-based reviews of children's dietary guid-

ance. She has served on numerous expert panels including the Centers for Disease Control and Prevention Expert Panel on Complementary Feeding Practices in the United States, the U.S. Department of Agriculture Nutrition Evidence Library Technical Expert Collaborative for the Dietary Guidance Development Project for Infants and Toddlers from Birth to 24 Months and Women Who Are Pregnant, and the Institute of Medicine Committee on Dietary Risk Assessment in the WIC Program and Committee on Evaluating Obesity Prevention Efforts. She is a member of the Academy of Nutrition and Dietetics and the American Society for Nutrition. She earned her Dr.PH. in chronic disease epidemiology from the University of Pittsburgh and is a registered dietitian.

Frank Greer, M.D., is a professor of pediatrics (Emeritus) at the University of Wisconsin School of Medicine and a professor (Affiliate) of nutritional sciences at the University of Wisconsin College of Agriculture and Life Sciences. He is a fellow of the American Academy of Pediatrics (AAP) and a past chairman of the AAP Committee on Nutrition. He is a fellow in the American Society for Nutrition. Dr. Greer's professional experience includes clinical work in neonatology and the Director of the Neonatology Fellowship Program at the University of Wisconsin. He has held offices in many pediatric research organizations and groups, including the Midwest Society for Pediatric Research, the International Society for Research in Human Milk and Lactation, and the North American Pediatrics Bone and Mineral Working Group. He has served on the U.S. Food and Drug Administration Subcommittees on Infant Formula and the Pregnancy, Birth to 24 project. Dr. Greer is the author or co-author of 145 published articles and papers, as well as 27 books or book chapters, and served as the co-editor of the 7th and 8th editions of AAP's *Pediatric Nutrition Handbook*. He also is the recipient of numerous research grants in the fields of neonatal nutrition, bone mineral content, bioavailability of calcium, and a myriad of other topics. He has served on the editorial boards of both the *Journal of Nutrition* and *Pediatrics*. He is a winner of the Faculty Development Award for University of Wisconsin Systems and the Founders' Award of the Midwest Society for Pediatric Research, the Douglas Richardson Memorial Award from the New England Association of Neonatologists, and President's Award and Callan-Leonard Award from the Wisconsin Association of Perinatal Care. Dr. Greer received his M.D. from the University of Pennsylvania in Philadelphia.

Debra Haire-Joshu, Ph.D., M.S.N., M.S.Ed., is a scholar of health behavior who develops, tests, and disseminates population-wide interventions to reduce obesity and prevent diabetes, particularly among underserved women and children. She is the Joyce Wood Professor of Public Health

and Medicine at Washington University in St. Louis, with a joint appointment to the Brown School and School of Medicine and is a senior scholar in the Washington University Institute for Public Health. Dr. Haire-Joshu is the director of the Center for Obesity Prevention and Policy Research and the director of the National Institutes of Health (NIH)-funded Center for Diabetes Translation Research, which supports a network of researchers addressing health equity among rural, American Indian/Alaskan Native, and African American populations. She currently serves as the principal investigator of NIH studies that focus on the dissemination of evidence-based interventions embedded within the routine practice of a national home-visiting program, designed to prevent weight gain among women during pregnancy and throughout the child-bearing years. Dr. Haire-Joshu was a Robert Wood Johnson Foundation Health Policy Fellow, which informs her work linking evidence to policy, including the development of a bistate obesity policy tracking database. She has served on numerous advisory boards and NIH review groups. Dr. Haire-Joshu has published extensively in peer-reviewed literature and authored textbooks addressing diabetes management across the life span and transdisciplinary public health, as well as numerous chapters on obesity prevention.

Rafael Pérez-Escamilla, Ph.D., is a professor of public health, the director of the Office of Public Health Practice, and the director of the Global Health Concentration at the Yale School of Public Health. His global public health nutrition and food security research program has led to improvements in breastfeeding programs, iron deficiency anemia among infants, household food security, and maternal, infant, and young child nutrition counseling programs. He has led major research studies assessing the effect of community health workers on behavioral and metabolic outcomes among Latinos with type 2 diabetes. He has published more than 250 research articles, 3 books, and numerous journal supplements, book chapters, and technical reports. He is a member of the National Academy of Medicine (elected in 2019) and the Connecticut Academy of Science and Engineering (elected in 2020). He is a former member of the U.S. National Academies of Sciences, Engineering, and Medicine's Food and Nutrition Board. He served on the 2010 and 2015 U.S. Dietary Guidelines Advisory Committees. He has been a senior advisor to maternal–child health and nutrition programs as well as household food security projects funded by the World Health Organization, UNICEF, the Food and Agriculture Organization of the United Nations, the Centers for Disease Control and Prevention, the U.S. Departments of Agriculture and Health and Human Services, the U.S. Agency for International Development, the World Bank, the Bill & Melinda Gates Foundation, the Robert Wood Johnson Foundation, and governments across world regions. From 2015 to 2016, he served as the chair of the

Robert Wood Johnson Foundation-Healthy Eating Research Panel on Best Practices for Promoting Healthy Nutrition, Feeding Patterns, and Weight Status for Infants and Toddlers from Birth to 24 Months, which authored the report *Feeding Guidelines for Infants and Young Toddlers: A Responsive Parenting Approach*. He obtained his B.S. in chemical engineering from the Universidad Iberoamericana in Mexico City and his M.S. in food science and Ph.D. in nutrition from the University of California, Davis. He was awarded the 2020 American Society for Nutrition Kellogg Prize for Lifetime Achievements in International Nutrition.

Charlene Russell-Tucker, M.S.M., R.D.N., is the deputy commissioner of education for the Connecticut State Department of Education, a role in which she oversees educational supports and wellness priorities. Prior to her appointment as deputy commissioner in November 2019, she served as the chief operating officer and the division chief for the Department's Office of Student Supports and Organizational Effectiveness. She also served as an associate commissioner of education and the bureau chief within the Department overseeing a portfolio of programs and services that included student health, nutrition and safety, family engagement, afterschool programs and services, adult education, special education, and magnet and charter schools. She is a performance-driven and visionary education leader with more than 20 years of experience in successfully leveraging the interconnectedness of the social, emotional, physical, and mental health of students and their families as foundations for positive school and life outcomes. She supports family and community engagement in education as well as equity and diversity initiatives. Ms. Russell-Tucker participates on various state and national committees; she is the co-chair of the Connecticut General Assembly Committee on Children Strategic Action Group on Chronic Absenteeism and has served on National Academies of Sciences, Engineering, and Medicine expert panels. She currently serves as the president of the Connecticut Academy of Nutrition and Dietetics. Finally, Ms. Russell-Tucker has extensive teaching experience as an adjunct faculty member at the Albertus Magnus College School of New Dimensions.

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