



# Young Children: Preparing for the Future

# 4

Jennifer Shiel, Lindsay M. Boland, and Kathrina Prelack

## Keywords

Children · Growth charts · Pediatric malnutrition · Dietary recommendations · Childhood obesity  
Physical activity · Food insecurity · Food allergies · Iron-deficiency anemia · Dental caries

## Key Points

- A well-balanced diet can provide the energy and nutrients that children need to grow, learn, and play.
- The Centers for Disease Control and Prevention growth charts are typically used to monitor growth.
- The Dietary Guidelines for Americans and MyPlate are appropriate tools to support healthy food choices for children.
- Childhood overweight and obesity is a multifactorial issue which requires a comprehensive approach, including diet, physical activity, psychological support, behavior modification, and care-taker involvement.
- Food insecurity, iron-deficiency anemia, dental caries, and food allergies are all issues which may affect dietary quality and may necessitate referrals to registered dietitians or nutrition assistance programs.
- Nutritional and vitamin supplements are not necessary for well-nourished children.

## Introduction

Childhood is a time of rapid growth and development, and proper nutrition is essential for supporting this. Adequate nutrition not only supports development but can help promote academic success and reduce the risk of chronic diseases such as obesity [1]. It is important for children to establish a

---

J. Shiel

Clinical Nutrition Department, Shriners Hospitals for Children, Boston, MA, USA

e-mail: [jennshiel@shrinenet.org](mailto:jennshiel@shrinenet.org)

L. M. Boland

Department of Nutrition, Brigham and Women's Hospital, Boston, MA, USA

e-mail: [lboland@bwh.harvard.edu](mailto:lboland@bwh.harvard.edu)

K. Prelack (✉)

Clinical Nutrition Department, Shriners Hospitals for Children, Boston, MA, USA

Simmons University, Boston, MA, USA

e-mail: [kathrina.prelack@simmons.edu](mailto:kathrina.prelack@simmons.edu)

foundation of healthy dietary habits early on in order to carry these skills into adulthood. Children should have a well-balanced diet providing a variety of nutrient-dense foods in order to ensure adequate nutrient intake. Eating habits can be impacted by a variety of factors, but parents and caregivers play an especially important role in modeling healthy eating behaviors and influencing a child's relationship with food later in life [1].

---

## Monitoring Growth

The Centers for Disease Control and Prevention (CDC) recommends that the World Health Organization (WHO) growth standards be used to monitor the growth of children under 2 years of age and the CDC growth charts for children age 2 years and older [2]. Children under 2 years should be weighed without clothes or diapers and measured in a recumbent position. Children over the age of 2 should be weighed and measured in light clothing without shoes and standing for a measure of stature. The growth charts can be used to plot trends in weight-for-age, height-for-age, head circumference-for-age, weight-for-height, and body mass index (BMI)-for-age. Trends for these measures should be monitored and can be used to determine whether there is potential nutritional risk [3].

BMI is measured in children over the age of 2 years and can be used as a screening tool to determine underweight, overweight, or obesity, paying particular attention to changes in percentiles and z-scores over time [4]. A BMI below the fifth percentile for age indicates underweight, while between the 85th and the 95th percentiles indicates overweight, and a BMI greater than the 95th percentile indicates obesity [3]. It is important to note that other factors can impact growth trends, such as gestational age, chronic illness, and biological parents' stature, and therefore these should also be taken into account when trending growth over time [3].

---

## Assessing Growth and Nutrition Risk

Assessment of growth involves close monitoring of growth chart percentiles and z-score trends. Growth chart percentiles indicate where a child fits compared to the reference standard [5]. Z-scores denote units of standard deviation from the median and can detect movement toward or away from the median. Z-scores are more sensitive and precise than percentile changes [6]. Both weight-for-length and BMI-for-age assess the appropriateness of an individual's weight compared to length or height, even in patients with chronic malnutrition or growth stunting. Further evaluation is often warranted if the weight for length z-score is less than  $-1$  or at approximately the 10–15th percentile [7]. Growth velocity is another measure used to assess growth and identify patients at nutrition risk.

---

## Pediatric Malnutrition

Pediatric malnutrition is defined as an imbalance between nutrient requirement or intake and expenditure or loss, resulting in cumulative deficits of energy, protein, or micronutrients that negatively affect growth, development, and other relevant outcomes. The etiology of malnutrition can be illness related or non-illness related. Illness-related malnutrition occurs when a disease or injury directly results in nutrient imbalance mechanisms including decreased intake, altered nutrient utilization, increased nutrient losses, or hypermetabolism not matched by intake [8]. Non-illness-related malnutrition can be a result of environmental, socioeconomic, or behavioral factors directly contributing to decreased nutrient intake or delivery. The diagnosis of malnutrition includes pediatric malnutrition which can be classified as either acute ( $<3$  months) or chronic ( $>3$  months). Malnutrition diagnostic

**Table 4.1** Primary indicators of pediatric malnutrition when single data point is available (use weight-for-length or weight-for-height z-scores from the growth chart. Use only BMI for children >2 years old [9])

Indicator	Mild malnutrition	Moderate malnutrition	Severe malnutrition
Weight-for-height z-score	-1 to -1.9 z-score	-2 to -2.9 z-score	-3 or greater z-score
BMI-for-age z-score			
Length/height-for-age z-score	No data	No data	-3 z-score
Mid-upper arm circumference	Greater than or equal to -1 to -1.9 z-score	Greater than or equal to -2 to -2.9 z-score	Greater than or equal to -3 z-score

Reprinted from Becker et al. [9], with permission from John Wiley and Sons

**Table 4.2** Primary indicators of pediatric malnutrition—two or more data points available [9]

Indicator	Mild malnutrition	Moderate malnutrition	Severe malnutrition
Weight gain velocity (<2 years of age)	Less than 75% of the norm for expected weight gain	Less than 50% of the norm for expected weight gain	Less than 25% of the norm for expected weight gain
Weight loss (2–20 years of age)	5% usual body weight	7.5% usual body weight	10% usual body weight
Deceleration in weight-for-length/height z-score	Decline of 1 z-score	Decline of 2 z-score	Decline of 3 z-score
Inadequate nutrient intake	51–75% estimated energy/protein need	26–50% estimated energy/protein need	≤25% estimated energy/protein need

Reprinted from Becker et al. [9], with permission from John Wiley and Sons

criteria often includes the following: weight-for-length z-scores (<2 years old), BMI-for-age z-score (>2 years old), height- or length-for-age z-score, mid-upper arm circumference (MUAC) z-score (3 months to 18 years), MUAC measurement (6 months to 5 years), weight gain velocity (1 month to 2 years), weight loss (2–18 years), deceleration in weight-for-length or BMI-for-age z-score, and inadequate nutrient intake (Tables 4.1 and 4.2) [9].

## Nutrition Guidance

### Energy and Nutrient Needs

Estimated energy requirements are based on age, weight, height, sex, and level of physical activity. Table 4.3 shows the estimated energy requirements for different gender and age groups. The table also states the recommended dietary allowance amounts and adequate intakes for selected nutrients. Requirements for energy and most nutrients rise steadily with age.

A diet rich in fiber provided by fresh fruits and vegetables, whole grains, and legumes is essential for preventing constipation [11]. Several studies have indicated that a diet rich in fiber is also associated with better nutrient intake, reduced risk of obesity, and better cognitive function in children [12–14]. These improved health outcomes are associated with the fact that whole grains and legumes are excellent sources of fiber, protein, B vitamins, and minerals including potassium and magnesium [15]. Simple swaps to whole grain breads and pastas, as well as including fruits and vegetables at snack time, can increase daily fiber intake. When increasing fiber content, ensure adequate fluid intake to prevent worsening of constipation [16].

**Table 4.3** Recommended dietary allowance (RDA) and adequate intake (AI) for selected nutrients in childhood based on the estimated energy requirements (EER) for age, weight, height, and sex at a sedentary level of activity [10]

Gender and age (year)	EER energy (kcal/day)	RDA protein (g/day)	AI fiber (g/day)	RDA iron (mg/day)	AI calcium (mg/day)	RDA vit D (IU/day)
Male (1–3)	1000	13	14	7	700	600
Male (4–8)	1400	19	19.6	10	1000	600
Male (9–13)	1800	34	25.2	8	1300	600
Female (1–3)	1000	13	14	7	700	600
Female (4–8)	1200	19	16.8	10	1000	600
Female (9–13)	1600	34	22.4	8	1300	600

Adapted from Dietary Guidelines 2015–2020 [10]

Fluids in the diet should be provided primarily by water and milk. Milk not only contributes to daily fluid needs but also provides protein and several micronutrients including calcium and vitamin D. Various food sources with high water content, such as fruits and vegetables, can contribute to fluid intake [17]. Fluid requirements can be calculated based on the weight of the child, calculating 100 mL of fluid/kg of body weight under 10 kg (22 lb.), and adding 50 mL/kg up to 20 kg (44 lb.), and another 20 mL/kg above 20 kg [17, 18]. The requirement for fluid is increased with physical activity, fever, vomiting, diarrhea, and other medical conditions as well as hot, dry, or humid weather [17, 18].

Sugar-sweetened beverages, including soda, sports, and energy drinks, are an increasing concern in children's diets. Evidence suggests that consumption of these beverages is associated with overweight and obesity in children, as well as increased risk of dental caries [19–21]. The WHO therefore recommends limiting free sugars to less than 10% of total energy intake. Free sugars include sugars added to food and drinks by the consumer or manufacturer, as well as sugars naturally found in fruit juices, syrups, and honey [20].

Children consuming a diet in compliance with the Dietary Guidelines for Americans (see below) are likely to consume adequate amounts of vitamins and minerals. However, children's diets may often be below the RDA for iron, calcium, or vitamin D. Dietary strategies for increasing iron intake and absorption include limiting milk or soy beverage intakes, consuming meat and meat alternatives along with a source of vitamin C to increase absorption, and including iron-fortified breakfast cereals in the diet. Calcium can inhibit iron absorption, so calcium-rich products should therefore be consumed at a different time than foods containing iron. If calcium is a concern, intake can be increased by offering a variety of low-fat dairy products, dark-green leafy vegetables, and calcium-fortified foods such as cereal or soy milk. Children who do not consume adequate milk or fortified alternatives daily should consider a supplement in order to ensure adequate intake to meet the RDA of 600 IU/day [22].

## Dietary Guidance

The Dietary Guidelines for Americans, 2020–2025 provide recommendations across the life cycle from birth to adulthood [23]. Current average intakes for vegetables, whole grains, and dairy among young children are lower than recommended intake ranges, while exceeding limits for added sugar, saturated fat and sodium. Recommendations for children parallel those for the general US population. They include:

- Consume a variety of vegetables and fruits (particularly whole fruits).
- Choose whole grain over refined grains or starches.
- Include a variety of protein choices such as seafood, lean meats, nuts, beans, eggs, and low fat dairy.
- Limit sodium, added sugars, and saturated and trans fats.

Although 100% fruit juice can be part of a healthy diet, it is low in fiber and should not exceed 4 ounces per day in children. Fats are an important part of the diet supplying vitamin E and essential fatty acids. Fat intake should come primarily from monounsaturated fatty acids (MUFAs) and polyunsaturated fatty acids (PUFAs), such as those found in nuts, seeds, and fish.

The MyPlate resource from the USDA provides education regarding food groups, appropriate serving sizes, and recipes, all geared to support the recommendations made by the Dietary Guidelines [24]. MyPlate plans can be personalized for children and adolescents by entering their age, sex, and physical activity level. Following the personalized recommendations can help children meet their energy and nutrient needs and encourage physical activity.

---

## Healthy Eating Behaviors

As children enter their toddler years, the rate of growth slows, and there is a corresponding decrease in appetite. This can be a great source of worry to parents who may become overwhelmed with the task of achieving nutritional recommendations with a toddler who has suddenly become less interested in food. This decrease in appetite coincides with developmental stages in which asserting independence and establishing self-control are central to the child.

Ellyn Satter's [25] work on eating competence recommends a division of parental and child responsibility. It is the parent's responsibility to offer a variety of healthy foods at meals and snacks, and the child's responsibility to decide how much they will eat, and even whether they will eat at all. Research by Fildes et al. [26] has shown that exposure to a variety of foods in infancy can increase acceptance in toddler years, and it is established that children with repeated exposure to different foods have increased acceptance of those foods [27].

The following suggestions may help to encourage children to eat a variety of healthy foods:

- Offer a variety of different foods starting in infancy. A new food may need to be offered up to 15 times before it is accepted.
- Serve new foods in small portions, along with familiar foods, and at the beginning of the meal when the child is hungry and more likely to try something new.
- Try eating regular mealtimes together as a family as much as possible, and model good food choices for children.
- Mealtimes should be a time for socialization and nourishment, and not a time for television or working.
- Discourage "grazing" throughout the day. Instead, offer regular meals and snacks during the day, giving the child a chance to build up an appetite between eating occasions.
- For safety, children should be seated and supervised any time that they eat.
- Encourage children to participate in food selection at the grocery store, food preparation, and serving of the meal.
- Serve age-appropriate portion sizes, and use MyPlate as a meal portion tool.
- Encourage self-feeding and food exploration which will allow the child to become familiar with new tastes and textures.
- Never force a child to eat, and avoid using food as a reward.

Many studies have looked at parent/caregiver feeding style and their influence on eating behaviors in young children. An authoritative feeding style where parents are supportive, nondirective, and in tune with a child's preferences while still creating boundaries and expectations around food intake is associated with the healthiest outcomes [28]. Using this approach, children learn to eat from internal cues of hunger instead of external indicators such as time of day or emotional/social influences. Parental modelling of healthy eating practices and a supportive home environment that includes

family mealtimes and physical activity are also important in establishing such healthy eating patterns [29]. Conversely, a highly directive or demanding parenting style around food, known as the authoritarian feeding style, can negatively impact eating patterns and weight. The use of controlling feeding practices that include pressure or restriction disrupts the development of healthy eating behaviors including self-regulation and instead lead to an unhealthy relationship with food. Over the long term, this can reinforce negative behaviors such as eating in the absence of hunger and emotional eating [30].

---

## Nutrition Concerns During Childhood

### Childhood Obesity

The prevalence of overweight and obesity in children has been rising steadily over the past three decades. According to CDC data for 2015–2016, the prevalence of obesity, defined as a BMI-for-age greater than the 95th percentile, was 18.5%, with the highest rates seen in 12–19-year-olds [31]. Besides the social and emotional problems associated with overweight status, these children are also at higher risk for chronic diseases, including hypertension, the beginnings of atherosclerosis, and type 2 diabetes [32].

The causes of overweight are multifactorial, and approaches for prevention and treatment should address not only diet and physical activity but also necessary psychological support, behavior modification, and caregiver involvement. The goal of treatment is to slow the rate of weight gain and allow for growth in height to catch up to weight. In children with severe overweight, moderate weight loss may be advised but should be overseen by a physician and registered dietitian. When calories are restricted, it becomes difficult to achieve sufficient intake of necessary vitamins and minerals; therefore, nutrient-dense foods must be emphasized. A focus on setting small attainable goals over time can help promote lifestyle changes as opposed to setting restrictions that may initially offer results, but will not prove to be sustainable for the long term.

Parents should be encouraged to follow the suggestions outlined above for improving intake of a variety of healthy foods. In addition, three factors have a pronounced impact on weight status in children: physical activity, consumption of sugar-sweetened beverages, and television viewing.

The importance of exercise for children was emphasized above. Children should be encouraged to go outside, participate in sports, and engage in active play throughout the day. Children age 6 years and older are recommended to have at least 60 minutes of physical activity daily, through a variety of activities [33]. Sedentary activities, such as screen time, video games, sitting in a stroller, and being in a car, can contribute to overweight and obesity in children. Sedentary activities use very little energy, and time spent viewing television often replaces physical activity in the daily schedules of children, and therefore should be limited. Sugar-sweetened beverages have been shown to be a significant factor in the development of obesity in children [23]. These beverages, including soft drinks and artificially sweetened fruit beverages, offer little or no nutritional value and should be offered in child-sized portions on special occasions, rather than for daily intake.

### Food Insecurity

A 2018 report from the USDA noted that approximately 7% of American children were food insecure, meaning households were unable to provide adequate nutritious food for children due to the lack of resources [34]. The characteristics of households more likely to be food insecure include incomes near or below the poverty level; headed by a single parent; and Black- or Hispanic-headed

households. Chronic food insecurity can result in poor nutrition and poor academic performance. Children from low-income, food-insecure households are at increased risk of iron-deficiency anemia (see below). Children from food-insecure households should be referred for food assistance programs such as the National School Lunch and Breakfast Programs, Food Stamps, and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

## Food Allergies and Sensitivities

True food allergies involve an antibody response to large molecules in the blood; therefore, the only way to make a diagnosis is to test for antibodies. Food allergies are estimated to affect about 8% of American children, with the most common food allergens being milk, eggs, fish, crustacean shellfish, wheat, soy, peanuts, and tree nuts [35]. Children may outgrow allergies to milk, eggs, and soy. Previously, the consensus among the medical community had been to avoid early introduction of potential common food allergens, in particular peanuts. However, recent reviews have shown there is no need to delay the introduction of potentially allergenic foods beyond 6 months of age, but that they should not be introduced before 4 months of age [36]. Recent evidence also suggests that early introduction of peanut products such as bamba or peanut powder (avoiding whole peanuts due to choking hazard) can actually prevent peanut allergy [36].

When a true food allergy is present, the only remedy is strict avoidance of the offending food. Children with food allergies must be taught skills to recognize and refuse foods to which they are allergic and to recognize symptoms of a possible allergic attack, such as tingling of the mouth and throat. Children who have serious food allergies should carry a supply of epinephrine in case of accidental ingestion of the allergen. If whole food groups, such as dairy, must be eliminated, a dietitian should work with the family to ensure that all nutrient needs are met. See Chap. 20 for more about food allergies. In contrast, children with food sensitivities or intolerances may experience symptoms such as nausea, vomiting, headache, or hives, but without an antibody response. Foods that are commonly implicated in intolerances include lactose-containing dairy products or gluten.

## Iron Deficiency Anemia

Iron deficiency anemia is a global problem, affecting approximately half of children under the age of 5 around the world [37]. The overall rate is lower in the United States, estimated at approximately 6% of children age 5 years and under; however, low-income children are at greater risk [37]. Iron is vital for children's neurological development, and iron deficiency anemia may lead to developmental issues with learning, memory, or behavior [37]. Strategies to improve iron intake were discussed in the Nutrition Guidance section. When dietary methods to improve iron intake do not resolve the problem, iron supplements may be necessary. When iron deficiency is suspected, it is important to evaluate serum markers before suggesting iron supplementation.

## Dental Caries

Oral health is an important part of a child's overall health, and dental caries have become one of the more common childhood chronic diseases. About one in five children aged 5–11 years old will have at least one decayed and untreated tooth, and children in lower-income families are twice as likely to have dental caries [38]. Children should routinely have dentist visits and in between should be encouraged to actively brush and floss daily, and especially after meals. Dietary recommendations are to

avoid sodas or sugar-sweetened beverages and snacks, and instead replace these with water throughout the day, as well as fruits and vegetables at snack times. Calcium and vitamin D intake is also important for building strong bones and teeth, so meeting intake goals through inclusion of a variety of sources (dairy foods, dark-green leafy vegetables) is essential.

## Vitamin and Mineral Supplementation

When children consume a well-balanced and nutrient-dense diet, vitamin and mineral supplements are not necessary. Some children may benefit from iron or vitamin D supplementation, as noted above. When supplements are given, parents should be cautioned to use a brand specifically formulated for children and to make sure that the doses given do not exceed the tolerable upper intake for the child's age/weight. Iron supplements should be stored out of children's reach, as excess iron intake from supplements is a major cause of poisoning in children. Herbal supplements are not tested for safety in children and are therefore not recommended.

---

## Conclusion

Pediatric nutrition has a major impact on growth and development. Childhood is an important time to establish healthy eating and activity behaviors, in order to serve as a foundation for healthful practices over the life span. It is therefore important to ensure that children are offered a variety of nutrient-rich foods early on. Energy-dense foods, such as refined carbohydrates and sugar-sweetened beverages, should be limited as they can lead to adverse health outcomes. Parents/caregivers should be encouraged to practice Ellyn Satter's division of responsibility, where "parents are responsible for deciding *what*, and children are responsible for deciding *how much*" [25]. In addition to healthy eating habits, children should also be encouraged to play and engage in physical activity every day. Parents/caregivers should act as role models and model healthy living behaviors for their children to provide the framework for lifelong healthful habits.

---

## References

1. Position of the Academy of Nutrition and Dietetics. Nutrition guidance for healthy children ages 2 to 11 years. *J Acad Nutr Diet*. 2014;114:1257–76.
2. CDC (Centers for Disease Control and Prevention). Use and interpretation of the WHO and CDC growth charts for children from birth to 20 years in the United States. 2013. <http://www.cdc.gov/nccdphp/dnpao/growthcharts/resources/growthchart.pdf>. Accessed 12 May 2020.
3. CDC (Centers for Disease Control and Prevention). Growth charts and WHO growth standard charts. 2000. <http://www.cdc.gov/growthcharts>. Accessed 12 May 2020.
4. Position of the Academy of Nutrition and Dietetics. Interventions for the prevention and treatment of pediatric overweight and obesity. *J Acad Nutr Diet*. 2013;113:1375–94.
5. Sonnevile K, Duggan C. "Chapter 2 Nutrition Assessment". *Manual of pediatric nutrition*. People's Medical Publishing; 2014. p. 10.
6. Dibley MJ, Staehling N, Nieburg P, Trowbridge FL. Interpretation of Z-Score anthropometric indicators derived from the International Growth Reference. *Am J Clin Nutr*. 1987;46:749–62.
7. Texas Children's Hospital. *Texas children's hospital pediatric nutrition reference guide*. 12th ed. Houston: Texas Children's Hospital; 2019.
8. Mehta NM, Corkins MR, Lyman B, Malone A, Goday PS, Nieman Carney L, et al. American Society for Parenteral and Enteral Nutrition Board of Directors. Defining pediatric malnutrition: a paradigm shift toward etiology related definitions. *J Parenter Enteral Nutr*. 2013;37:460–81.
9. Becker P, Nieman Carney L, Corkins MR, Monczka JJ, Smith E, Smith SE, et al. Academy of Nutrition and Dietetics; American Society for Parenteral and Enteral Nutrition. Consensus Statement of the Academy of Nutrition and Dietetics/American Society of Parenteral and Enteral Nutrition: indicators recommended for the identification and documentation of pediatric malnutrition (undernutrition). *Nutr Clin Pract*. 2015;30:147–61.



10. Dietary Guidelines 2015–2020. Nutritional goals for age-sex groups based on dietary reference intakes and dietary guidelines recommendations. <https://health.gov/our-work/food-nutrition/2015-2020-dietary-guidelines/guidelines/appendix-7/>. Accessed 30 Apr 2020.
11. National Institute of Diabetes and Digestive and Kidney Disease: Constipation. 2018. <https://www.niddk.nih.gov/health-information/digestive-diseases/constipation>. Accessed 30 Apr 2020.
12. O’Neil CE, Nicklas TA, Fulgoni VL, DiRienzo MA. Cooked oatmeal consumption is associated with better diet quality, better nutrient intakes, and reduced risk for central adiposity and obesity in children 2–18 years: NHANES 2001–2010. *Food Nutr Res.* 2015;59:26673.
13. Khan NA, Raine LB, Drollette ES, Scudder MR, Kramer Hillman CH. Dietary fiber is positively associated with cognitive control among prepubertal children. *J Nutr.* 2015;145:143–9.
14. Lin Y, Huybrechts I, Vereecken C, et al. Dietary fiber intake and its association with indicators of adiposity and serum biomarkers in European adolescents: the HELENA study. *Eur J Nutr.* 2015;54:771–82.
15. Mozaffarian D. Dietary and policy priorities for cardiovascular disease, diabetes and obesity. *Circulation.* 2016;133:187–225.
16. Larson H. Easy ways to boost fiber in your daily diet. Academy of Nutrition and Dietetics. <https://www.eatright.org/food/vitamins-and-supplements/types-of-vitamins-and-nutrients/easy-ways-to-boost-fiber-in-your-daily-diet>. Accessed 30 Apr 2020.
17. Kids Eat Right: Water: How Much Do Kids need? 2020. <https://www.eatright.org/fitness/sports-and-performance/hydrate-right/water-go-with-the-flow>. Accessed 30 Apr 2020.
18. Merck Manual. Dehydration in children. <http://www.merckmanuals.com/professional/pediatrics/dehydration-and-fluid-therapy-in-children/dehydration-in-children>. Accessed 9 Apr 2020.
19. Liberali R, Kupek E, de Assis MAA. Dietary patterns and childhood obesity risk: a systematic review. *Child Obes.* 2020;16:70–85.
20. WHO. Guideline: sugars intake for adults and children. 2015. <https://www.who.int/publications-detail/9789241549028>. Accessed 29 Apr 2020.
21. WHO. Reducing consumption of sugar-sweetened beverages to reduce the risk of childhood overweight and obesity. 2016. [http://www.who.int/elena/titles/ssbs\\_childhood\\_obesity/en](http://www.who.int/elena/titles/ssbs_childhood_obesity/en). Accessed 28 Apr 2020.
22. NIH: Office of Dietary Supplements: Vitamin D: Fact Sheet for Health Professionals. <https://ods.od.nih.gov/fact-sheets/VitaminD-HealthProfessional/>. Accessed 28 Apr 2020.
23. U.S. Department of Health and Human Services, US Department of Agriculture. 2015–2020 Dietary guidelines for Americans. 8th ed. Washington: U.S. Dept of Health and Human Services; 2015. [https://www.dietaryguidelines.gov/sites/default/files/2019-05/2015-2020\\_Dietary\\_Guidelines.pdf](https://www.dietaryguidelines.gov/sites/default/files/2019-05/2015-2020_Dietary_Guidelines.pdf). Accessed 24 Apr 2020.
24. USDA Choose My Plate. <https://www.choosemyplate.gov/>. Accessed 24 Apr 2020.
25. Satter E. Ellyn Satter’s division of responsibility in feeding. 2016. <https://www.ellynsatterinstitute.org/wp-content/uploads/2016/11/handout-dor-tasks-cap-2016.pdf>. Accessed 13 May 2020.
26. Fildes AM, Lopes C, Moreira P, et al. An exploratory trial of parental advice for increasing vegetable acceptance in infancy. *Br J Nutr.* 2015;114:328–36.
27. Anez E, Remington A, Wardle J, Cooke L. The impact of instrumental feeding on children’s responses to taste exposure. *J Hum Nutr Diet.* 2013;26:415–20.
28. Carnell S, Benson L, Driggin E, Kolbe L. Parent feeding behavior and child appetite: associations depend on feeding style. *Int J Eat Disord.* 2014;47:705–9.
29. Pyper E, Harrington D, Manson H. The impact of different types of parental support behaviours on child physical activity, healthy eating, and screen time: a cross-sectional study. *BMC Public Health.* 2016;16:568.
30. Bergmeier H, Skouteris H, Haycraft E, Haines J, Hooley M. Reported and observed controlling feeding practices predict child eating behavior after 12 months. *J Nutr.* June 2015;145:1311–6.
31. Hales, C, Carroll M, Fryar C, Ogden C. CDC National Center for Health Statistics (NCHS) Data Brief. Prevalence of obesity among adults and youth: United States, 2015–2016 . <https://www.cdc.gov/nchs/data/databriefs/db288.pdf>. Accessed 7 Apr 2020.
32. WHO. Infant and young child feeding. 2016. [http://www.who.int/maternal\\_child\\_adolescent/documents/9789241597494/en](http://www.who.int/maternal_child_adolescent/documents/9789241597494/en). Accessed 7 Apr 2020.
33. US Department of Health and Human Services. 2008. Physical activity guidelines. <https://health.gov/our-work/physical-activity/previous-guidelines/2008-physical-activity-guidelines>. Accessed 16 Apr 2020.
34. USDA: Household Food Security in the United States in 2018. [https://www.ers.usda.gov/webdocs/publications/94849/err270\\_summary.pdf?v=963.1](https://www.ers.usda.gov/webdocs/publications/94849/err270_summary.pdf?v=963.1). Accessed 23 Apr 2020.
35. CDC: Healthy Schools- Food Allergies. <https://www.cdc.gov/healthyschools/foodallergies/index.htm>. Accessed 7 Apr 2020.
36. Greer FR, Sicherer SH, Burks AW, AAP Committee On Nutrition, AAP Section On Allergy And Immunology. 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 comple-

- mentary foods. *Pediatrics*. 2019;143(4). <https://pediatrics.aappublications.org/content/pediatrics/143/4/e20190281.full.pdf>.
37. Wang M. Iron deficiency and other types of anemia in infants and children. *Am Fam Physician*. 2016;93(4). <https://www.aafp.org/afp/2016/0215/p270.html>.
38. CDC Oral Health Basics: Children's Oral Health. <https://www.cdc.gov/oralhealth/basics/childrens-oral-health/index.html>. Accessed 7 Apr 2020.

## Suggested Further Readings

- Dietary Guidelines for Americans 2015–2020. <https://www.dietaryguidelines.gov/>.
- My Plate for Meal Planning. <https://www.choosemyplate.gov/>.
- Satter E. *Child of mine*. Boulder: Bull Publishing Company; 2000.
- WHO Maternal, Newborn, Child and Adolescent Health. [https://www.who.int/maternal\\_child\\_adolescent/topics/child/nutrition/en/](https://www.who.int/maternal_child_adolescent/topics/child/nutrition/en/).