

calories (around 18 to 30 oz per day). Formula-fed infants are at higher risk for obesity later in childhood; this may be related to self regulation of volumes ingested by the newborns and infants.

### COMPLEMENTARY FOODS

By approximately 6 months, complementary feeding of semisolid foods is suggested. By this age, an exclusively breastfed infant requires additional sources of several nutrients, including protein, iron, and zinc. Cereals commonly are mixed with breast milk, formula, or water and later with fruits. To help identify possible allergies or food intolerances that may arise when new foods are added to the diet, single-grain cereals (rice, oatmeal, barley) are recommended as starting cereals. If juice is given, it should be started only after 6 months of age, be given in a cup (as opposed to a bottle), and limited to 4 oz daily of 100% natural unsweetened juice. An infant should never be put to sleep with a bottle or cup filled with milk, formula, or juice because this can result in Early Childhood Caries (ECC) (see Chapter 127).

Green vegetables bring nutrients, vitamin, minerals, and micronutrients. Children should get two to three servings of vegetables. For infants with a strong family history of food allergy, foods with high allergic potential, such as fish, peanuts, tree nuts, dairy products, and eggs, should probably be avoided. All foods with the potential to obstruct the young infant's main airway should be avoided in general until 4 years of age or older. Because of the risk of infant botulism, honey should not be given before 1 year of age.

Commercially prepared or homemade foods help meet the nutritional needs of the infant. If the introduction of solid foods is delayed, nutritional deficiencies can develop, and oral sensory issues (texture and oral aversion) may occur. General signs of readiness include the ability to hold the head up, maturity (around double the birth weight), opening their mouths wide, showing eager anticipation of eating food and interest in foods, sitting unassisted, bringing objects to the mouth, and the ability to track a spoon. The choice of foods to meet micronutrient needs is less critical for formula.

Caries are tooth infections that start as early as when the deciduous teeth (baby teeth) have erupted. A tooth cavity is caused by a combination of sugar and bacteria in the mouth. Eating a healthy diet and brushing regularly will control sugar and bacteria. Rubbing infant gums with a wet washcloth can be the first step in oral hygiene. There are also ergonomically designed tooth brushes, comfortable and safe for infants, used to rub their gums and create the habit of oral hygiene. A variety of feeding habits beyond nursing and bottle feeding are implicated as causes of dental caries in childhood that can lead to problems with adult teeth and health. This infection can be prevented by healthy food choices and habits starting in infancy. Exposure to different textures and the process of self-feeding are important neurodevelopmental experiences for infants. A healthy diet is recommended to take full advantage of the child's developmental milestones and for the child's well-being. For the first 2 months it is important to set the stage by making distinctions between sleeping and feeding time. At 4 to 6 months of age, beginning to actively separate mealtime from bedtime is recommended.

## Chapter 28

# DIET OF THE NORMAL CHILD AND ADOLESCENT

### NUTRITION ISSUES FOR TODDLERS AND OLDER CHILDREN

Learning healthy eating behaviors at an early age is an important preventive measure because of the association of diet with several chronic and noncommunicable diseases (NCDs), such as obesity, diabetes, and cardiovascular disease, which may account for approximately 60% of all deaths worldwide. These diseases share risk factors that can be modified by lifestyle changes such as eating less processed food and increasing physical activity. Diets high in fruits and vegetables together with increased physical activity improve metabolic risk factors. The first 1000 days of life are an important time to engage in healthy nutrition behaviors that will promote well-being. Accelerated postnatal growth in infants and young children is an important risk factor for obesity; interventions should be aimed at identifying underlying causes for early prevention. For a discussion of nutrient needs for children and adolescents, see <http://www.health.gov/dietaryguidelines>.

### MILK

The consumption of cow's milk is ideally not introduced until approximately 1 year of age when it is better tolerated. Low-fat (2%) or whole milk is recommended until 2 years of age, after which fat-free or 1% milk is recommended. Excessive milk intake (more than 24 oz/day) should be avoided in toddlers because larger intakes may reduce the intake of a good variety of nutritionally important solid foods and also result in iron deficiency anemia; large intakes also may contribute to excessive caloric intake.

### JUICES

Juice intake for toddlers and young children should be limited to 4 oz, and juice intake for children 7 to 18 years of age should be limited to 8 oz/day. Water and milk are the recommended drinks during the day.

### GENERAL RECOMMENDATIONS

"ChooseMyPlate" by the U.S. Department of Agriculture can provide parents with a general guideline for the types of foods to be offered on a regular basis. A child should eat three meals a day and two healthy snacks. A general rule for the quantity of food to offer to a child is one tablespoon per age of each food provided per meal, with more given if the child requests. As a rule of thumb, children should not be eating more than an adult palm per serving. By 1 year of age, infants should be eating meals with the family, have a regular schedule of meals and snacks, and be encouraged to self-feed with appropriate finger foods.