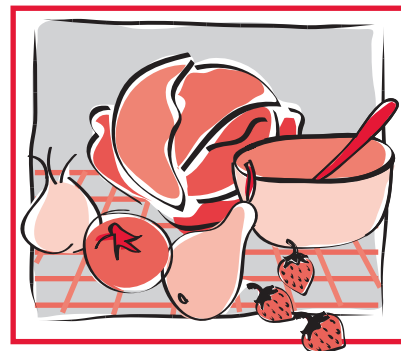


## Nutrition and Oral Health

Fact Sheet No. 9.321

Food and Nutrition Series | Health



by L. Bellows and R. Moore\*

Research shows that adequate nutrition is essential not only for overall physical health, but also for the development and maintenance of a healthy mouth—especially the teeth and gums. The relationship between diet and oral health is highly related—as good nutrition has a role in preventing tooth decay and gum disease, while the health of our teeth and gums helps determine the type of foods we can eat. In fact, when we are lacking one or more nutrients in our diet, the first symptoms of deficiency often manifest in the mouth (usually with vitamin C, B-complex vitamins, and protein deficiency). Good oral health practices begin early in life and should be maintained throughout life.

### The Process of Tooth Decay

The process of tooth decay (otherwise known as *dental caries*) begins when certain bacteria, which are always present in the mouth, break down components of saliva. These components then adhere to tooth enamel, forming *dental plaque*—a clear, gelatinous material that allows bacteria to remain on the teeth. If dental plaque is not removed frequently (at least once a day) by proper brushing and flossing, the plaque becomes tightly attached to the tooth and only a professional cleaning can remove it. Dental plaque can also cause *gingivitis*—a condition that causes inflammation of the gums, tissue breakdown, and possible tooth loss.

### Tooth Demineralization

Inside the dental plaque, bacteria actively ferment dietary carbohydrates to be used as a food source. This fermentation produces several acids that demineralize (breakdown) the tooth enamel. As the tooth demineralizes, bacteria move into the tooth, resulting in tooth decay and formation of a cavity.

### Implications for Nutrition and Diet

Untreated dental caries is painful and can result in tooth loss, which may lead to the inability to chew certain foods. Malnutrition or abnormal digestion may result, since these conditions often prevent a person from chewing and eating adequate amounts of food as well as eating some hard, high-fiber foods. Additionally, many diseases such as type 1 and type 2 diabetes, and cardiovascular disease, may exacerbate these conditions and lead to poor oral health.

Since bacteria need carbohydrates for food, the rate of dental caries can be reduced by cutting back on simple carbohydrates such as sucrose, glucose, and fructose (Table 1).

### Flouride and Tooth Mineralization

A well balanced, healthy diet is equally important during infancy, childhood, and adolescence. During these growth periods, primary and permanent teeth are mineralized- before the teeth even erupt into the mouth. Mineralization and tooth development require *fluoride*, a mineral that is incorporated into the tooth structure, making the tooth strong and decay resistant. Fluoride intake from birth has been shown to reduce dental caries by as much as 60%.

### Fluoridated Water

Many community water supplies are fluoridated at the rate of 1 ppm (1 part per million), a safe and effective rate for effectively reducing dental caries. The normal daily intake of fluoride from fluoridated water is about 1 milligram per day. When teeth are forming, an intake of more than 2 parts per million may cause *fluorosis*, a condition in which tooth enamel becomes toughened, mottled and discolored. However, teeth still remain strong and resistant to decay.

### Quick Facts

- Regular check-ups and cleanings (twice a year) with your dentist are important steps in maintaining good oral health.
- Brush and floss teeth at least once a day--after each meal or snack is best.
- In areas with low fluoride levels in the community water supply, use a toothpaste or mouthwash containing fluoride.
- Limit foods and beverages that are high in simple carbohydrates or sugar. Choose healthy snacks with low levels of sugar.
- To prevent "nursing bottle syndrome," never allow a child to fall asleep with a bottle.

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\*L. Bellows, Colorado State University Extension food and nutrition specialist and assistant professor; R. Moore, graduate student. 9/2013

Table 1. Foods that may act to increase or decrease the risk for dental caries (tooth decay).

Increases Risk*	Decreases Risk**
Sugar-sweetened beverages (soda, energy drinks, processed fruit juice).	Sugar-free food items.
Sticky foods (candy, caramel, syrup).	Fruits and vegetables (have also been shown to reduce the risk for oropharyngeal cancer).
Snacks with sugar (cookies, cakes, pastries).	Foods rich in protein such as lean meats, eggs, fish, beans, and legumes.
Simple sugars such as honey, sucrose, and molasses.	Whole-grains, specifically breads and cereals low in sugar.

\*The length of time that these foods are consumed is also a factor in the risk for tooth decay, as consuming these foods for an extended period of time acts to increase the risk for decay.

\*\* These foods and beverages should be consumed at least 2 hours apart, ideally in an unprocessed form.

### Sources of Fluoride

In communities where drinking water has little or no fluoride, prescription fluoride drops or tablets may be prescribed by a doctor. A popular alternative to supplements is the daily use of fluoridated toothpaste and mouthwash. Contact your local water department for more information on fluoride levels in your community water supply.

### Oral Health During Pregnancy, Infancy, and Childhood

Tooth development begins shortly after conception, usually between the sixth and eighth weeks of gestation, and continues throughout pregnancy. At birth, 83% of a child's tooth enamel has already formed, thus emphasizing the importance of adequate maternal nutrition throughout pregnancy. Only severe nutritional deficiencies and excesses in the mother (such as calcium, phosphorus, fluoride, iron, and iodine, along with vitamins A, C, and D) have the potential to cause obvious changes in tooth formation in the child. However, even slight deficiencies may cause changes in tooth structure that could place a child at greater risk for tooth decay later in life. Maintaining a healthy, balanced diet throughout pregnancy is of utmost importance for both mother and child. Before deciding to take a supplement during pregnancy, consult a medical professional or registered dietitian. For more detailed information on the recommended guidelines for oral health of infants and young children, see fact sheet [Introducing Solid Foods to Infants](#).

### Early Childhood Caries (ECC)

Otherwise known as “baby-bottle tooth decay,” this preventable dental problem affects young children and is characterized by the rapid decay of primary upper teeth and some lower back molars. The lower front teeth are seldom affected. This condition develops when a child is given a bottle that contains juice, milk, formula, or other sweetened beverage at bed or nap time. While the child is awake and sucking, saliva flow helps wash sugars away from teeth. As the child falls asleep, sucking and saliva flow decreases, and the sugars in the liquid collect around the teeth allowing for an excellent feeding ground for bacteria.

Painful decay results from this practice. If left untreated, infections and abscesses are possible. Premature loss of upper teeth may lead to the child developing poor “tongue-thrust.” This could cause poor alignment of permanent teeth and future orthodontic and speech problems. It is important to never allow a child to fall asleep with a bottle.

In brief, since dental caries is the most prevalent form of chronic disease in children, it is important to follow these important oral health guidelines for the following life stages:

#### Birth - 12 months

- Begin oral hygiene practices (brushing or rinsing the mouth) after the first tooth erupts.
- Encourage routine consumption of milk, rather than on-demand feeding.
- Limit bottle contents to water, milk, or formula.

### Facts About Carbohydrates and Bacteria

- Sucrose (table sugar) is the primary carbohydrate that bacteria prefer. However, other simple carbohydrates such as fructose, lactose, and glucose, are easy to ferment and also support bacteria growth.
  - Simple sugars are found in many foods and may also be known as: table sugar, corn syrup, honey, molasses, and dextrose.
  - Bacteria also can ferment complex carbohydrates (such as starches), but the process takes longer. Many complex carbohydrates are sticky and become lodged between teeth and gums which allows the bacteria time to ferment the carbohydrate.
  - Although fresh fruits and vegetables do contain carbohydrates that can be fermented by bacteria, their high water content acts to dilute the sugars, and fiber content helps clean the teeth, thereby protecting against tooth decay.
  - Wipe gums with a washcloth or gauze pad after feedings to reduce the transmission of bacteria.
  - Do not provide bedtime bottles, or night-time feedings.
  - Attempt to wean the child from the bottle by 1 year of age.
- 1 - 3 years*
- Children should avoid or limit consumption of sugar beverages such as soda, juice, and sports drinks.
- 3 - 10 years*
- Eat starchy, sticky, or sugary foods with foods low in sugar.
  - Consume dairy products with meals and snacks.
  - Combine fruits and vegetables with high sugar carbohydrates (to induce salivation).

- Limit consumption of sugary beverages such as soda, juice, and sports drinks.
- Limit bedtime snacks.
- Encourage sugar-free chewing gum after meals and snacks.

## Oral Health for Older Adults

Adults over the age of 65 comprise a large portion of the population with untreated dental diseases such as dental caries and periodontal disease. In fact, 25% of these individuals have no natural teeth, and are more likely to experience chronic disease and take medications; both of which may have negative effects on oral health. The diets of older adults who have experienced tooth loss, wear dentures, or have implants, are of special concern because eating adaptations may be required. Dentures are not equivalent to natural teeth, and those with dentures tend to take larger bites of food items and may avoid some hard fruits and vegetables all-together.

Since this population is at an increased risk for malnutrition and nutrition deficiency, it is important that these individuals seek advice from a medical professional or dietitian regarding tips for preparing and eating certain foods.

## Tips to Reduce the Risk of Tooth Decay

- Read food labels in order to identify and limit foods high in simple sugars and carbohydrates. Look for words that end in “-ose” such as fructose, glucose, lactose and sucrose.
- Meats and foods high in fiber such as fresh fruits and vegetables, help clean the teeth of food particles and sugars during the chewing process. These foods promote saliva flow, which helps rinse the teeth of food particles. Saliva also acts to neutralize the acid.

- Though eating three meals a day is important for adequate energy and nutrient intake, snacking between meals presents special dental health problems especially if the snacks are high in simple sugars. Choose nutrient dense snacks that do not harm teeth, such as cheese, yogurt, meats, plain nuts, peanut butter, fresh fruits and vegetables, unsweetened breads or cereals, and popcorn.
- Foods that contain calcium and phosphorus may act to re-mineralize teeth, a process that replenishes minerals after they have been removed by acids.
- Beverages without sugar (fluoridated water, milk, tea, coffee) are the best choices to prevent tooth decay. Avoid sugar sweetened beverages such as soda, juice, or sports drinks.
- Using artificial sweeteners in place of real sugars does not contribute to tooth decay.
- Thoroughly brushing one’s teeth after meals and snacks is the best way to remove sugars and food particles from tooth surfaces.
- Brush teeth at least twice daily with fluoride containing toothpaste, preferably after meals and snacks. Floss and use mouth rinse, once daily.
- Chewing sugar-free gum is another option that will increase saliva in the mouth and remove food particles that cause tooth decay.
- Frequent visits to the dentist and regular cleanings from a dental hygienist (at least 2 per year) are very important.

## Additional Resources

CSU Extension fact sheets:

[\*Introducing Solid Foods to Infants\*](#)

[\*Water-Soluble Vitamins:  
B-Complex and Vitamin C\*](#)

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