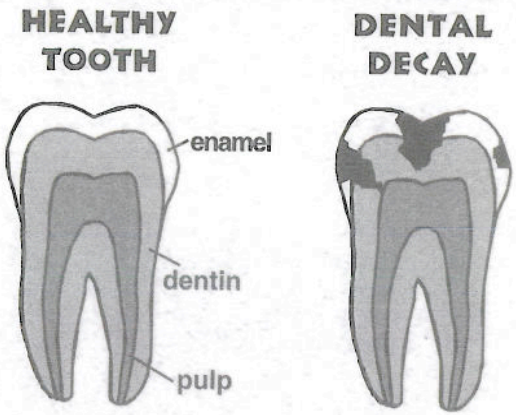
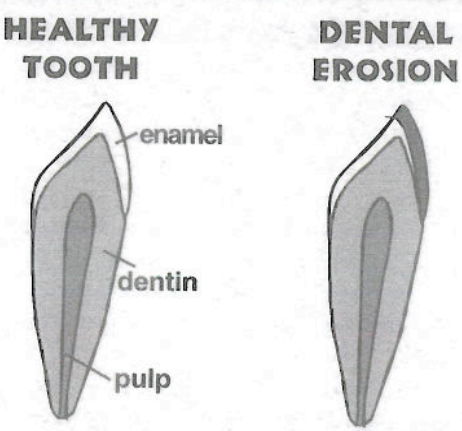


DENTAL DECAY

Dental decay is the loss of hard tissue from the enamel and dentin of the tooth. A "cavity" is the hole in the tooth resulting from this process. For decay to occur, three factors must be present at the same time: the tooth, bacteria and carbohydrates (sugars and starches). Bacteria are normally present in the mouth. These bacteria eat carbohydrates found in food and produce acid. The acid dissolves the enamel of the tooth.

Bacteria
+ Carbohydrates
Acid → Decay

When carbohydrate and bacteria are present in the mouth, acid can be produced to destroy teeth. When carbohydrate or bacteria are absent from the mouth, acid is not produced and other factors can "heal" teeth. A cavity is formed when the destruction of enamel is greater than the healing of enamel. Fluoride, found in water, toothpaste and food, helps to heal teeth and prevent cavities.



DENTAL EROSION

Dental erosion refers to the loss of hard tissue from the enamel of the tooth surface. Erosion is caused by exposure of the tooth to an acidic food or liquid. When an acidic liquid repeatedly washes over the tooth, it gradually dissolves the hard tissue and removes the enamel layer. The acidity of beverages can be measured and is reported in pH units; a pH below 7 is considered acidic. A lower pH value indicates a higher acid content. For example, tomato juice has a pH of 4.1 and lemon juice has a pH of 2.3; thus, lemon juice is more acidic than tomato juice.

CARBOHYDRATES

Carbohydrates, including sugars and starches, provide energy to the body. They are found naturally in fruit, vegetable, grain and dairy products. Sugars are also added to foods and beverages.

Carbohydrates are essential for health. It is recommended that 55% of the total energy in the diet come from carbohydrates, but 10% or less of the energy should come from sugar added to foods.

Oral bacteria can digest both sugars and starches to produce acid. Actual production of acid depends on the amount of carbohydrate and the length of time carbohydrates are present in the mouth.

EATING HABITS

Eating habits also influence the risk of dental decay. The number of times we eat carbohydrates during the day determines the number of opportunities for bacteria to produce acid. The length of time we spend eating each food or drinking each beverage also influences the amount of time bacteria may produce acid. Thus, a limited number (4-6) of short (20-30 minutes) eating or drinking episodes will decrease the risk of decay.

CAFFEINE

Caffeine is a stimulant which increases alertness and decreases fatigue. Frequent intake of caffeine-containing products such as soda pop may create a dependency state when sudden withdrawal leads to symptoms of lethargy, irritability and headaches.

SODA/POP

These beverages are increasing in popularity and have the potential to significantly increase risk of decay. The nutrient content of selected pops (12-oz. can) is provided below in order of highest to lowest caffeine level. By comparison, brewed coffee contains 137mg caffeine per 8 oz. cup.

	NUTRIENT CONTENT			
Pop	Calories	Sugar (tsp)	Caffeine (mg)	pH†
Mt. Dew	170	11.0	55*	3.16
Diet Mt. Dew	0	0	55*	3.29
Surge	174	10.1	53	2.42
Coke	145	9.7	46*	2.47
Diet Coke	0	0	46*	3.19
Pepsi	150	9.8	37*	2.51
Diet Pepsi	0	0	36*	3.06
Sprite	144	9.4	0	3.24
Diet Sprite	3	0	0	3.35

*A caffeine-free variety is available

†All pops are acidic

ORAL HEALTH

The sugar in regular pop can be digested by oral bacteria to produce acid which dissolves enamel. The amount and frequency of consumption will influence the risk of caries development; more pop and more frequent intake increase this risk. In addition, pop is acidic in nature and can contribute to surface erosion; the combination of the acidic liquid and acid production by bacteria can cause a significant increase in extensive cavities (see photo on cover).

Diet pop does not have sugar and oral bacteria cannot produce acid from this beverage. Therefore, diet pop is not associated with an increased cavities risk. However, the diet pop is acidic and can cause surface erosion; therefore, more frequent intake of diet pop will increase this risk.

SYSTEMIC HEALTH

Pop does not provide nutrients to the diet. One can (12 oz.) of regular pop contains 150-180 kcal from sugar; this is the daily allowance of added sugar for most adults. Additional pop either provides excess calories or displaces foods providing essential nutrients to the diet.

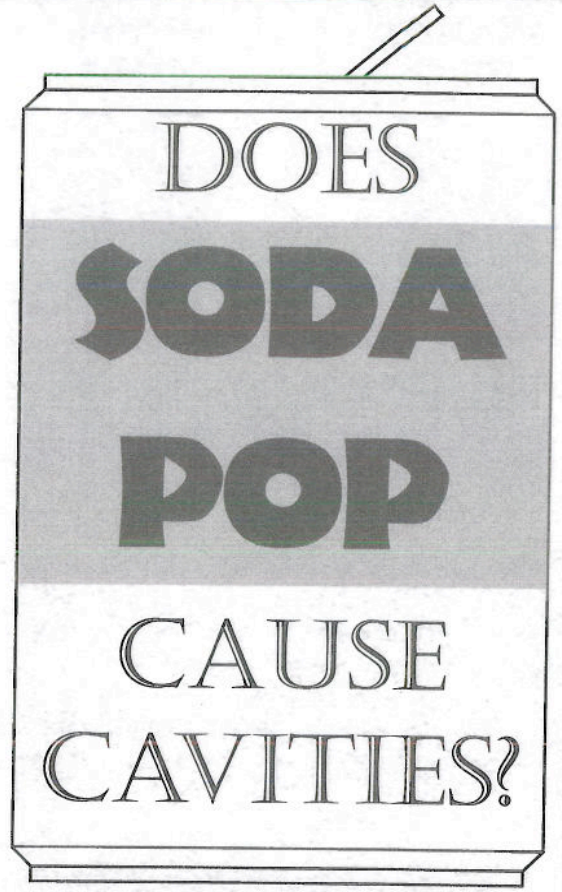
Diet pop does not contribute to sugar intake and systemic health does not limit its use. However, diet pop does not contain nutrients and should not replace beverages, such as milk, which contribute calcium and vitamin D to the diet. This is especially important during childhood and adolescence.

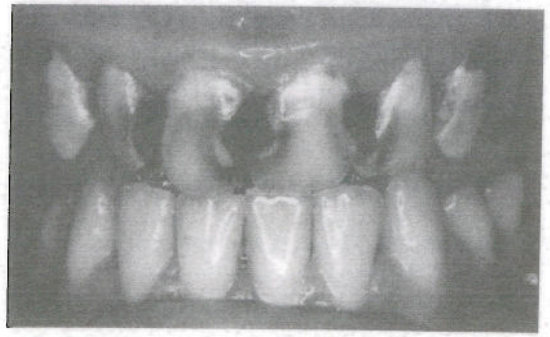
RECOMMENDATIONS

1. If you choose to drink regular pop, limit intake to 1 can (12 oz.) per day. Drink this can quickly or with a meal/snack to limit the time sugar is present in the mouth.
2. If you choose to drink diet pop, intake is not limited by the sugar content. Drink diet pop relatively quickly, instead of sipping, to limit exposure of teeth to the acid.
3. Select water and other sugar-free beverages for between-meal thirst quenchers. Limit intake of calorie-containing beverages including milk and juice to meal and snack times.
4. Consumption of 2-4 servings of milk or other dairy products is recommended for development of healthy bones and teeth in children and prevention of osteoporosis in adults.

© 1998
The University of Iowa
Authors: Teresa Marshall, PhD, RD/LD
Marsha Cunningham, RDH, MS

To order, call:
Department of Preventive & Community Dentistry
(319) 335-7184
preventive-dentistry@uiowa.edu





THE UNIVERSITY OF IOWA
COLLEGE OF DENTISTRY
IOWA CITY, IA 52242