



**EFFECTS OF SUGARS ON ORAL HEALTH**

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**ABSTRACT**

It is the position of the Academy of Nutrition and Dietetics that, "Nutrition is an integral component of oral health". The Academy supports integration of oral health with nutrition services, education, and research. Collaboration between dietetics practitioners and oral health care professionals is recommended for oral health promotion and disease prevention and intervention. Scientific and epidemiological data suggest a lifelong synergy between diet, nutrition, and integrity of the oral cavity in health and disease. Oral infectious disease as well as acute, chronic, and systemic diseases with oral manifestations impacts an individual's functional ability to eat and their nutrition status. Likewise nutrition and diet can affect the development and integrity of the oral cavity and progression of oral diseases.<sup>[1]</sup> A well balanced nutritious diet is important for good oral health and general health. The food we eat supplies the nutrients that the body, bones, teeth and gums need to renew tissues and help fight infection and disease. Hectic lifestyles fast food, bad diets, large amounts of sugar and trendy supplements can contribute to gum disease and tooth decay. Food high in sugars and starches increase the production of acids that can erode and weaken the tooth's outer layer (enamel). Eventually these acids can cause tooth decay.<sup>[2]</sup>

**KEYWORDS:** Sugars, starches, gum disease, tooth decay.

**INTRODUCTION**

This article focuses on sugars and oral infectious disease, with an emphasis on the relation between sugars and dental caries. Sugars play a harmful role in tooth decay. The bacteria that form together to become plaque use sugar as a form of energy. They multiply faster and the plaque grows in size and thickness. Some of the bacteria turn the sugar into a kind of glue that they use to stick themselves to the tooth surface. This makes it harder for the bacteria to get washed away with your saliva.

A recent study spotlighted by NPR talks about the effects that sugar has on your teeth:

Sugar also plays a vital role in formation of cavities. Tooth decay is caused by acids produced by bacteria found in the mouth. A little of sugar in the food we eat gets left in the mouth even after we swallow and these traces of sugar are what bacteria thrives on.

**Dental Erosion**

Dental erosion also known as Acid erosion is a type of tooth wear. It is defined as the irreversible loss of tooth structure due to chemical dissolution by acids not of bacterial origin. Dental Erosion is the most common chronic disease of children ages 5-17. Erosion is initially found in the enamel and if unchecked may proceed to the underlying dentin.<sup>[3]</sup>

The most common cause of erosion is by acidic foods and drinks. In general foods and drinks with a pH below 5.0-5.7 have been known to trigger dental erosion effects.<sup>[4]</sup> Numerous clinical and laboratory reports link erosion to excessive consumption of soft drinks. Other possible sources of erosive acids are from exposure to chlorinated swimming pool water and regurgitation of gastric acids.

**Causes of Dental Erosion**

**1. Extrinsic acidic sources**

Acidic foods and drinks lower the pH level of the mouth so consuming them causes the teeth to demineralise. Drinks low in pH level that cause dental erosion include soft drinks, wine, beer, etc.

Saliva acts as a buffer, regulating the pH when acidic drinks are ingested. Drinks vary in their resistance to the buffering effect of saliva. A number of medications such as vitamin C, aspirin and some iron preparations are acidic and may contribute towards acid erosion.<sup>[5]</sup>

**2. Intrinsic acidic sources**

Dental erosion can occur by non-extrinsic factors too. Intrinsic dental erosion is known as perimolysis, whereby gastric acid from the stomach comes into contact with the teeth.<sup>[6]</sup> GERD is quite common and an

average of 7% adults experience reflux daily.<sup>[6]</sup> GERD is mainly due to increased acid production by the stomach.

### Dental Caries

Dental Caries also known as tooth decay or cavity is an infection bacterial in origin that causes demineralization and destruction of the hard tissues of the teeth. It is a result of the production of acid by bacterial fermentation of food debris accumulated on the tooth surface.<sup>[7]</sup> If demineralization excess saliva and other remineralization factors dental caries occurs.

The cavity becomes noticeable only when the enamel and dentin are destroyed. The affected areas of the tooth change color and become soft to the touch. This exposes the nerve of the tooth resulting in pain that can be transient, temporarily worsening with exposure to heat, cold, or sweet foods and drinks.<sup>[7]</sup> A tooth weakened by extensive decay can fracture suddenly during normal chewing process.

Dental cavity also causes bad breath and foul tastes.<sup>[8]</sup> In highly progressed cases infection can spread from the tooth to the surrounding soft tissues. All caries occur from bacterial acid demineralization that exceeds saliva and fluoride remineralization. Demineralization occurs where bacteria is left on the teeth as plaque. Cavities occur mostly inside pits and fissures where brushing is difficult.

### Sugars and Other Carbohydrates

Frequency - Although proper oral hygiene and fluoride use are the primary tools for preventing tooth decay, dietary changes can help. The goal should be to limit the frequency and severity of acid attacks on teeth. It is not the total amount of sugars and starches ingested that matters most in caries formation but the frequency of carbohydrate consumption. Sugars and starches can be consumed without deleterious effects when they are ingested as part of main meals rather than eaten continuously throughout the day. Thus, spacing meals at least two hours apart allows dental plaque pH time to return to neutral.

Source - All fermentable carbohydrates, whether from the sugar bowl, fruits, vegetables, milk or grain products, break down to sugars in the mouth and can lead to tooth decay. In fact, an expert report by the Food and Agricultural Organization (FAO)/World Health Organization (WHO) states that it would be irrational to advise limiting consumption of sucrose as a means to prevent tooth decay if consumption of milk and fruit were not also limited.

Though the mechanism is unclear, chewing on high-protein foods in combination with fermentable carbohydrates may protect against dental caries. Also, the chewing action as well as the combination of raw and cooked foods in the mouth can increase salivary

production, which minimizes the effect of fermentable carbohydrates on teeth.

Form - Carbohydrate-containing foods that are sticky and that adhere to teeth are potentially more cavity-causing because they are difficult to brush away and may remain in the mouth for longer periods of time. Examples of foods that stick to the teeth include caramels and dried fruit, while foods such as bread, potato chips and crackers are more likely to stick between the teeth.<sup>[9]</sup>

### Effect of Sugar in Oral Health

Sugar, saliva and bacteria lead to a formidable combination that may lead to tooth decay. After eating sugar, particularly sucrose, and even minutes of brushing your teeth, sticky glycoprotein adhere to the teeth to start the formation of plaque. At the same time millions of bacteria also adhere to the glycoprotein.

In the next stage bacteria use the fructose in a metabolism process of glycolysis to get energy.<sup>[9]</sup> The end product of glycolysis under anaerobic conditions is lactic acid. Lactic acid creates extra acidity to reduce the pH to extent of dissolving calcium in tooth enamel leading to cavity.

### Prevention

Preventive measures include frequent brushing and flossing to prevent plaque build up. A diet rich in calcium and fluoride in the water lead to stronger tooth enamel. A diet of more complex carbon hydrate that is low in sugar and no sucrose snacks between meals is also a good preventive measure.<sup>[10]</sup>

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