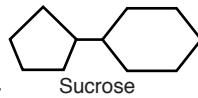


# *Streptococcus mutans*

Sucrose is used by the normal bacterial flora of the mouth for their metabolic and anatomical needs. The first step is the hydrolysis of sucrose into glucose and fructose.



Fructose will be used for ATP production in glycolysis. During this process  $\text{NAD}^+$  is reduced to  $\text{NADH}$ . However, glycolysis will cease if  $\text{NAD}^+$  does not again become available. To accomplish this,  $\text{NADH}$  reduces pyruvate to lactic acid, and it again takes on its oxidized form of  $\text{NAD}^+$ . Lactic Acid is a normal metabolic by product but can begin to erode tooth enamel.

Glucose is likewise used by some bacteria to produce a capsule that has adhesion functions. The capsular material is a polysaccharide is what we often call “dental plaque”.

Normally, bicarbonate ions within the saliva are will neutralize lactic acid as bacteria produce it. But if the bacteria is bathed in inordinate quantities of sugar, a great quantity of capsular material will be formed quickly and this becomes a barrier preventing the bicarbonate from neutralizing the lactic acid. The lactic acid now comes in contact with the teeth and begins to erode them, eventually causing dental caries.

