

Saliva, foods and dental caries

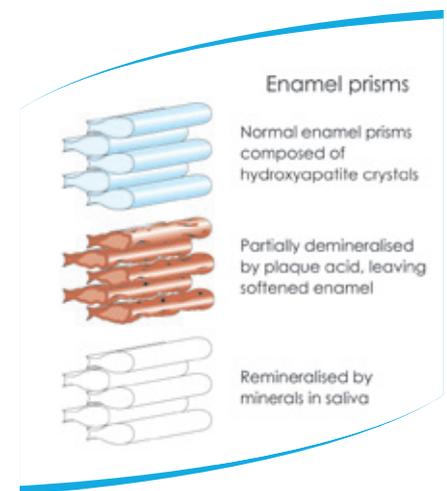
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The pH of dental plaque is a key factor in the balance between acid demineralisation of the teeth and the remineralisation of the initial caries lesion.

Plaque pH falls each time acids accumulate in the plaque due to bacterial acid production following the consumption of fermentable carbohydrates – mainly sugars – in foods and drinks.

On the other hand, **the plaque pH rises** when the acids are washed out and neutralised by saliva, which contains the important buffer, bicarbonate. The pH also rises when the plaque bacteria either metabolise the acids, or produce alkali such as ammonia from nitrogenous compounds found in foods and saliva.

Besides its role in the control of plaque pH, saliva has another function of major importance in caries – remineralising effects. Saliva is ‘supersaturated’ with the ions which make up the mineral content of the teeth (calcium, phosphate and hydroxyl ions) when the pH is above a ‘critical’ value, about 5.5. Below this value (e.g. after an intake of sugar) the saliva and plaque is unsaturated, and the tooth dissolves. Above this value, the calcium and phosphate ions in saliva start to repair the damaged mineral crystals in the enamel – the process of remineralisation.



Dental caries is the result of an imbalance between demineralisation and remineralisation. In health, loss of mineral is balanced by the reparative mechanisms of saliva. This equilibrium can be depicted chemically by the equation:



The solid crystals of the tooth mineral, called hydroxyapatite, dissolve to release calcium, phosphate and hydroxyl ions only if the latter are below saturation concentrations. If above saturation, the reaction will tend to move to the left, and any damaged crystals will be repaired by the acquisition of ions from solution.

Stimulation of saliva flow results in an increase in the washing out of acids (and sugars), and also an increase in the amount and concentration of bicarbonate buffers and of remineralising ions.

It has been shown that **salivary stimulation by chewing sugarfree gum after the consumption of sugary foods** not only **prevents the fall in plaque pH normally** seen, but also results in an **increased remineralising effect** in previously demineralised enamel.¹² It is likely that this salivary stimulation is responsible for the **reduction in caries** seen in clinical studies of the use of sugarfree gum.³⁴

Referencias:

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