3-a-day™ DAIRY may keep dental caries away

Despite the widespread use of fluoride in an effort to reduce tooth decay, dental caries remain one of the most common childhood diseases. Dairy products offer many health benefits beyond the well-known contribution to building strong bones, specifically with regard to preventing dental caries and periodontitis.

THE FACTS

There is substantial evidence for the role of milk and dairy products in promoting dental health.

- Several studies support the association between the consumption of milk and dairy products and the occurrence of fewer caries due to the presence of bioactive compounds [1,2,4,5,6].
- Milk consumption does not increase plaque acidity, which makes it an essentially 'tooth-friendly' food [1,2,7,8].
- Eating cheese has a cariostatic effect as it significantly increases the concentration of calcium in saliva and plaque. An enamel-protective effect is also evident when cheese is eaten after or before sugary foods as it prevents the pH of plaque to decrease [1,4,5].
- Limited dietary intake of calcium results in more severe periodontal disease, whereas increased calcium and vitamin D intake seems to facilitate a protective effect that prevents tooth loss [1,7,8,9].
- Evidence shows that adding milk, or the milk ions calcium and phosphate, to food not only diminishes the extent of tooth demineralisation but may also promote remineralisation [1,3,5,6,10].
- Regular consumption of yoghurt may be associated with a lower prevalence of dental caries in young children [1,5,8,9,11,12].

BENEFITS OF DAIRY PRODUCTS FOR DENTAL HEALTH

Several studies substantiate the beneficial effect of dairy on dental health. Evidence shows that milk or dairy products can reduce the demineralisation of enamel, promote its remineralisation and prevent the adhesion of *Streptococcus mutans* to the surface of teeth [12]. A study among American adults also showed an inverse association between the intake of milk products and the prevalence of periodontitis [1,7]. Higher maternal intake of total intake of dairy products, yoghurt and calcium during pregnancy was also found to be associated with a reduced risk of dental caries in children [1,8,9].

CHEESE

Chewing hard cheese, particularly cheddar cheese, has been found to prevent enamel demineralisation not only by stimulating salivary flow, which buffers the pH of dental plaque, but also by increasing the calcium and phosphorus concentrations in dental plaque, which favours remineralisation [1,2]. A prospective study from Japan also found that higher maternal intake of cheese during pregnancy was associated with a decreased risk of dental caries in children [1].

YOGHURT

Regular yoghurt intake was found to be significantly associated with lower prevalence of caries compared with intakes of less than once a week, showing a clear dose-response relationship [1,8]. Results from a number of studies also suggest that the intake of lactic acid foods such as yoghurt may help to prevent periodontal disease [1,8,13].

FLAVOURED MILK PRODUCTS

It is reasonable to assume that adding sucrose to milk will increase cariogenicity. However, the concentration at which the added sucrose overcomes the carioprotective properties of plain milk needs to be considered. The question is complicated by the knowledge that cocoa in flavoured milk itself has been shown to have protective properties [14]. Recent findings indicate that the cariogenic load of flavoured milk products is negligible to low [3,10,15]. Therefore, although the sugar content of flavoured milk has raised health concerns, sweetened dairy is regarded to be a preferable alternative to similarly sweetened beverages such as cordials, soft drinks and citrus juices. Findings from a number of studies suggest that the benefits of moderate consumption of flavoured milk outweigh possible concerns with regard to negative effects on dental health, particularly if increased milk consumption is balanced with controlled sugar intake [15].

POTENTIAL MECHANISMS OF PROTECTION

In addition to the nutritional benefits of dairy, an increasing amount of data demonstrates a bioactive function of dairy components in preventing dental caries among adults [6]. The non-cariogenic and cariostatic properties of milk appear to be due to several factors.

Casein, which accounts for 80% of milk proteins, contains several bioactive peptides. Bioactive peptides with anticariogenic activity prevent dental lesions through bacterial inhibition, competitive exclusion to enamel binding sites, improved buffering capacity in the pellicle surrounding teeth, reduced enamel demineralisation and enhanced enamel remineralisation [4].

Lactose cariogenicity has been intensely debated for many years. Much of this debate stems from evidence that organic acid metabolites produced from lactose fermentation by the oral microflora have a deleterious effect on tooth enamel. Although lactose comprises 80% of the carbohydrate content of milk – sufficient to render milk cariogenic – evidence shows that lactose is the least cariogenic of the common dietary sugars. Also, the co-presence of bioactive components in dairy has been found to provide a buffering action against the possible cariogenicity of lactose [10,16,17].

Consumption of products that contain probiotics, such as yoghurt, is currently considered an appropriate method in preventing dental caries [4]. Studies have shown that probiotics in milk products reduce *S. mutans* counts, possibly by modifying the composition of the salivary film and preventing bacterial adhesion [3,5,11].

It has been shown that lactoferrin, an iron-binding protein found in, among others, cow's milk, also inhibits the aggregation and adherence of Gram-negative bacteria such as *S. mutans*, the main bacteria involved in dental caries [2,6].

CONCLUSION

There is consistent scientific evidence that milk and dairy products are beneficial to dental health. Both the low cariogenic potential of milk and its carioprotective role have been demonstrated. The protective action appears to be facilitated by several properties of milk, namely (1) low cariogenic potential of lactose, (2) casein (and possibly also milk fats) being carioprotective, (3) the presence of bioactive peptides and (4) the protective and buffering role of calcium and phosphorus. The benefits of dairy for dental health should be advocated together with proper oral hygiene to help reduce the incidence of dental caries.

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