

The Fluoride Debate: The Pros and Cons of Fluoridation

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The following text is an excerpt from the study cited above:

MILK FLUORIDATION

Milk constitutes an essential food in early life and continues to provide benefits from childhood and adolescence up until and through old age. According to O'Mullane et al. (14), the concept of milk as a vehicle for fluoride emerged in the early 1950s and was first investigated almost simultaneously in Switzerland, the US, and Japan (18). Since 1986, programs aiming to validate the feasibility for community use of fluoridated milk for caries prevention were promoted and supported by the WHO International Programme for Milk Fluoridation (14). At present, milk fluoridation programmes, supported by the WHO and Food and Agriculture Organization, are running continuously in about 15 countries and various channels are used to provide fluoridated milk to children attending kindergarten and school.

The bioavailability of fluoride in milk and the biological plausibility of milk fluoridation were demonstrated by a significant amount of non-clinical published research. Four systematic reviews have been published on the clinical effectiveness of milk fluoridation in preventing dental caries. The first three reviews found that all studies reported a reduction in dental decay among those consuming/receiving fluoridated milk (19–21). However, the fourth wider-ranging review, including 18 studies conducted in 12 countries, found that only nine studies demonstrated caries prevention in primary teeth and 12 in the permanent dentition (22). A very recent study, conducted in Bulgaria, also showed that fluoridated milk delivered on a daily basis to children in schools resulted in substantially lowering caries development compared to children receiving milk with no added fluoride (23). In general, milk fluoridation is effective in the prevention of dental caries. In order to protect and reduce caries in primary teeth, it was recommended that fluoridated milk should be consumed by children early on, preferably before the age of 4 years, and at the eruption of their first permanent molars (24). Currently, more than one and a half million children worldwide consume fluoridated milk (24) and considerable knowledge on practical aspects of fluoridation was provided by the experience gained in this international program.

The daily dosage of fluoride per child varies from 0.50 mg to 0.85 mg (14). Children are advised to drink around 200 mL of fluoridated milk per day for about 200 days per year (22). Given that the dose is constant and related to age and background fluoride exposure, the risk of adverse effects is very low (22). However, milk fluoridation is a less efficient method for delivery of fluoride when compared to water fluoridation. The fluoride added to milk forms insoluble complexes that make fluoride absorption difficult (14).

The addition of fluoride to milk is a simple process and the costs of fluoridated and non-fluoridated milk are usually the same. Overall, the annual cost of the programs in Chile, Thailand, and the United Kingdom (UK) is around 2 to 3 US dollars per child (22,25,26).