



MILKSPLAT

Flavoured milk can help children achieve their nutritional goals

June 2016

An article published in Nutrition Reviews by Fayet-Moore¹ in 2015 presents the results of a meta-analysis that investigated a number of aspects linked to diet, nutrition, achievement of recommended nutrient goals and possible links to overweight that may impact on the use of flavoured milk by children. This study provides valuable insights regarding the role that flavoured milk currently plays in childhood and teenage nutrition.

The study was conducted because calcium and potassium are classified as “nutrients of concern” which many children, particularly teenage girls, do not ingest in adequate quantities. The inability of most populations to ensure that their children obtain sufficient calcium and potassium from the diet, is primarily linked to a decline in dairy product consumption. One strategy to counteract this trend has been to offer children and teenagers flavoured milk as a substitute for less nutrient-dense beverages. Flavouring involves the addition of flavouring agents and in most cases also of sugar, to milk. With the current concern that sugar may be driving the obesity epidemic, the researchers also studied the relationship between flavoured milk and body weight in children.¹

Fifty-three studies were included in the study and the most important findings are as follows:

- Milk is the most popular type of dairy food among children and the single most significant source of dietary calcium for children in the USA, Finland and Australia.
- The nutrient profiles of plain and flavoured milk are similar. Both types of milk contribute to the intake of protein, calcium, potassium, phosphorus, vitamins A and B12, iodine and riboflavin.
- The sugars used to produce flavoured milk constitute about 3% of energy per 100 ml compared to more than 20% of total energy per 100 ml contributed by sugar-sweetened soft drinks.
- In the past 6 years the composition of flavoured milk in the United States has been changed to meet changing nutrient requirements. Thus many ready-to-drink flavoured milks contain 38% less

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sugar and only fat-free flavoured milk is allowed to form part of the American federal school meal programme. Encouragingly most children have accepted the fat-free, lower-sugar versions of flavoured milk.¹

Factors driving preference of flavoured milk

- Children in countries such as the USA, Australia, Mexico and Pakistan preferred flavoured milk to plain milk and this preference was primarily driven by taste and availability.
- Taste is the most important driving factor when children select flavoured milk and the most popular flavour by far is chocolate. For example, in Greece, 50% of children between the ages of 8-16 years who drank flavoured milk, preferred chocolate flavour.
- In one study it was shown that when school children were offered flavoured milk, 69% of the children selected the flavoured milk, thus increasing their milk and nutrient intake and reducing wastage in school feeding schemes.
- Taste and sensory factors were identified as more important to the young consumers of flavoured milk than health perceptions and any parental influence or control.¹

Negative effects of removing flavoured milk from schools

- In New York City, total milk purchases fell by between 37% (grades 9-12) and 63% (pre-school children to grade 2) when flavoured milk was removed from the school meal programmes to try and reduce energy and sugar intakes. It was evident that “the nutritional tradeoff of 60 calories from high-fructose corn syrup (HFCS) resulted in a large reduction in consumption of a food that provides several essential nutrients.”¹ Flavoured milk in South Africa is not sweetened with HFCS.
- When researchers devised a model using other foods to replace the nutrients lost because of the removal of flavoured milk that led to reduced consumption of milk by children, it was found that 3 to 4 additional foods were required to make up the nutrient shortfall and that such substitutions led to significantly higher energy and fat intakes. Costs increased by approximately of about R 650-R700 (equivalent in dollars) per student per year.¹

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Flavoured milk boosts essential nutrient intake

- A 16-week randomised intervention study conducted by Albala and coworkers (2008)² in Chile found that when soft drinks were replaced with three 200 ml servings of flavoured milk a day, total milk and calcium intakes increased significantly and that the children receiving the flavoured milk had a lower total energy intake than the control group.
- Another study showed that flavoured milk contributed 22% of total calcium intake in Dutch pre-schoolchildren.
- In Australia, a study found that children who drank flavoured milk were 1.7 times more likely to achieve their calcium intake targets than children drinking plain milk in a sample of 9 to 16-year-olds of whom 60% were not meeting their recommended daily intakes for calcium.¹

Sugar content of flavoured milk

- According to the South African Food Tables (2010)³, full-fat/whole, low-fat/2% and fat-free/skim milk contains about 4.9 gram of lactose (an intrinsic sugar) per 100 gram.
- When non-consumers and consumers of flavoured milk were compared, no difference in sugar intake was identified except in one group of preschool children who ingested half a teaspoon more sugar if they were consumers of flavoured milk than the non-consumers in their age category.
- In terms of energy intake from sugar, the contribution of added sugars derived from flavoured milk in the USA was reported to be 3,3%.¹

Does flavoured milk contribute to overweight?

A number of studies have attempted to answer this question, but conflicting results were obtained, with some studies indicating that individuals consuming flavoured milk did not differ in average weight to non-consumers, while other studies showed that overweight children who consumed flavoured milk lost less body fat between the ages of 11 and 13 years, than non-consumers.

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Furthermore, a randomised controlled trial conducted in Chile found that flavoured milk had a beneficial effect on overweight and obese children. Three servings of 200 ml of chocolate flavoured milk were delivered to the homes of overweight or obese children (8-10 years) to replace cold drinks for 16 weeks. Although the percentage of body fat did not change between the control and experimental groups, the milk consumption of the experimental group increased by 452 g/day, and their consumption of sugar-sweetened beverages decreased by 711 g per day. The flavoured milk consumers gained more lean body mass and the boys had a greater increase in height than non-consumers. The authors concluded that replacing habitual consumption of sugar-sweetened beverages with flavoured milk, appears to have some beneficial effects on lean body mass and growth in overweight children². Additional studies are warranted to determine if flavoured milk can make a positive contribution to body weight or not.

Does flavoured milk contribute to dental caries?

Any discussion of health involving sugar inevitably also considers dental health and the tendency of the food or beverage in question to cause caries. In the case of flavoured and thus sometimes sugar sweetened milk, the findings of studies with large populations (e.g. 1000 preschool children aged 3-6 years in Pakistan), and smaller populations over long periods of up to two years, the general consensus was that sweetened milk products have a “negligible to low cariogenicity”. The latter 2-year study showed that there was no significant difference in the incidence of caries between participants who consumed standard chocolate milk, artificially sweetened chocolate milk, plain milk with sugar and chocolate colouring, or plain milk. However, when the preschool children who drank plain milk in the former study were compared to children who did not drink any milk at all, the non-consumers had a 24% higher risk of developing caries and tooth decay.¹

Milk can act as a buffer against the acids that are formed in the mouth from sugar and other sticky carbohydrates. These acids are responsible for the erosion of tooth enamel. Calcium, phosphorus and casein in milk are regarded as essential nutrients that can potentially counteract caries and maintain dental health. For example, in one study it was demonstrated that flavoured, milk sweetened with 10% sucrose or fructose was less cariogenic than water sweetened with 10% sugar.⁴

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Consequently, it has been suggested that the beneficial effect of milk (including flavoured milk) on dental caries and the proper application of dental hygiene can make a significant contribution to reducing the incidence of caries.⁴

Conclusions:

Of all dairy foods, milk is the most popular and nutrient-dense food, and flavoured milk is more popular than plain milk as determined by children's preferences. Children who do not have access to the high nutrient density of milk either struggle to or do not reach their target daily intakes for essential nutrients such as protein, calcium, potassium, phosphorus, vitamins A and B12, iodine and riboflavin. The use of fat-free flavoured milk with a reduced sugar content as prescribed in the USA, is a feasible solution to the problem of nutrient malnutrition and it should counteract potential negative effects on weight and dental health.

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- 1 Fayet-Moore F (2015). Effect of flavored milk vs plain milk on total milk intake and nutrient provision in children. *Nutrition Reviews*, 47(1):1-7.
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