

# Summary of: The fluoride contents of commercially-available soya milks in the UK

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## FULL PAPER DETAILS

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**Background** In some parts of the world, soya milks are found to be a significant source of fluoride (F). Among western commercial markets, although there has been a sustained increase in soya milk products available for purchase, there are limited data on their F content. **Objective** To determine the F content of soya milk products available in the UK market including fresh and ultra-high temperature products in addition to sweetened and unsweetened soya milks. **Materials and methods** Fifty-two traditional and UK-produced soya milk samples commercially available in northeast England were analysed to determine their F concentration using a modified hexamethyldisiloxane-facilitated diffusion method with a F-ion-selective electrode coupled to a potentiometer. **Results** The median F concentration of all products was 0.293 µg/ml ranging from 0.015 µg/ml to 0.964 µg/ml. The median F concentration of ultra-high temperature (UHT) (n = 42) milks was 0.272 µg/ml lower than 0.321 µg/ml obtained for fresh (n = 10) soya milks. Organic soya milks contained less F compared with non-organic for sweetened and unsweetened categories. **Conclusion** Commercially available soya milks in the UK do not pose an increased risk for dental fluorosis development. Further research is necessary into the manufacturing process of soya milks, which may influence the overall F content of the end product.

## EDITOR'S SUMMARY

One of the best things about living in the UK is the variety of cuisines and cooking ingredients available. For me in any case it is simply a joy. There is such a vast array of restaurants, from Korean to Kazakhstani, from Turkish to Thai. And it's not just restaurants and specialist shops that offer these choices. Our supermarkets are also now full of 'unusual' ingredients. World food aisles are growing longer and longer, jam-packed full of 'exotic' food. Indeed, much of what just 10 or 20 years ago would have been considered unusual has now spilled over to the general weekly shop – eg basmati rice, soya sauce and fresh parmesan cheese. However, this does mean that it is becoming more difficult for dental professionals to keep abreast of fluctuating diets and to ensure that their nutritional advice regarding their patient's oral health is up to date.

Some of these 'new' ingredients not only lead to variation in diet but actually end up replacing long-established food-stuffs – a case in point is soya milk as a substitute for cow's milk. Increasingly, people are developing lactose intolerance or allergies to cow's milk, and soya milk

provides these people with a viable alternative. Soya milk manufacturers are also continually working to improve the flavour of their products and so people are turning to soya for its low fat and hypocholesterolemic properties compared to dairy products. So what are the effects of increased soya milk consumption on our health?

In China, Japan and other parts of Asia, soya milk has long been a traditional staple. The 'other BDA', the British Dietetic Association, advises that though 'research on soya foods is ongoing, it is clear that soya is a nutritious, safe and palatable part of the diet which fits well with healthy eating guidelines. 'Soya foods can also help us to achieve a more plant-based diet by reducing our intakes of animal protein with potential benefits not only for health, but also for the environment.' But has its effect, if any, on oral health been taken into account?

We know that soya-based products have the ability to lower plaque pH but also have a higher acidogenic and cariogenic potential. However, no studies have been carried out to determine the fluoride (F) content of commercially-available soya milks in

the UK. Also, not all soya milks indicate the F content on their labels, though they often do contain considerably more F than cow's milk. In fact, this *BDJ* study is the *first* investigation into the F content of UK soya milk products. It provides answers to questions dentists or patients may have regarding the safety of soya milk as a cow's milk substitute in relation to dental fluorosis and oral health. This research will directly help dental care professionals to advise their patients on the safety of this relatively new food phenomenon (well, new to the Western World that is!) by providing a thorough analysis of the F content of these soya products.

The full paper can be accessed from the *BDJ* website ([www.bdj.co.uk](http://www.bdj.co.uk)), under 'Research' in the table of contents for Volume 217 issue 4.

1. British Dietetic Association. *Soya: the Basics*. BDA Food Fact Sheet. Online information available at <https://www.bda.uk.com/foodfacts/home> (accessed August 2014).

Ruth Doherty  
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**IN BRIEF**

- Provides information on the fluoride content of soya milks, highlighting the wide range of fluoride concentrations seen in soya milks in the UK market.
- Stresses the need for dental professionals to evaluate their child patients' daily fluoride intake when prescribing appropriate preventive therapies.
- Concludes that soya milks do not pose an increased risk for the development of dental fluorosis.

**COMMENTARY**

Soya milk as an alternative to bovine milk is growing in popularity. Little is known about the fluoride (F) content of these products. This is important information; fluoride will help prevent dental caries but may also cause dental fluorosis if given to an infant or young child. This study aimed to explore this by determining the F content of a range of soya milk products available in the UK.

A total of 52 different brands were purchased and stored appropriately with both fresh and UHT and sweetened and unsweetened brands represented. The authors had clearly sampled a broad range of products, some which could be consumed by young children whose teeth were still at risk of developing fluorosis. The fluoride content was assessed and care taken to ensure that the method was standardised and reliable.

The ranges of fluoride recorded between different products were large (0.015 to 0.964 µg/ml). Whether or not this would be enough to cause fluorosis, or prevent caries, is difficult to say as it will depend on the volume consumed and the age of the consumer. However, the levels of fluoride were similar to those found in community fluoridated water.

This study also helps remind us of the sugar content of some of the sweetened soya milks and highlights issues around labeling with 11 of the 28 sweetened soya products not identifying the type of sugars they contained. Consumers would perhaps be surprised to learn that at least one of the products tested contained high fructose corn syrup.

Effective diet advice is dependent on the dental practitioner understanding the nutritional content of any beverages patients are consuming. This study

is an invaluable tool in this assessment and reminds us that even products that might be viewed as 'healthy' could still pose a risk to the dentition, whether it be through increased risk of fluorosis or development of dental caries. More data are now required as to the effects of these products on teeth.

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**AUTHOR QUESTIONS AND ANSWERS****1. Why did you undertake this research?**

Soya milk remains a popular alternative to bovine milk for a number of health-related and lifestyle reasons and its global production of soya milk is increasing. We were already aware that soya-based infant milk formula (IMF) used in babies and young children tend to have a higher F content than non-soya based IMF. As such, it can pose an increased risk for the development of dental fluorosis if consumed in excessive amounts, and we were curious to know if this pattern applied to milks. We were unable to find any current literature on the variety and fluoride content of soya milks in the UK market and some market research into this area identified a wide selection of commercially available soya milks for the UK consumer.

**2. What would you like to do next in this area to follow on from this work?**

The fluoride contents of soya milks analysed showed a wide range, from 0.015 to 0.964 µg/ml. It was also evident that for the same manufacturer the fluoride concentration for the majority of products was similar irrespective of category; sweetened or unsweetened and organic or non-organic. This broad range and pattern within manufacturer may be due to differences in the manufacturing process of soya milks as this may influence the overall F content of the end product. An investigation into the production processes for processed soya products would help us to understand where in the manufacturing process the differences in their F concentrations arise. Identifying the source of the fluoride in these soya products would aid its reduction in products found to contain higher F concentrations, especially those used in younger children.