

Is the national food fortification programme successful? The case of folate status



The findings of the National Food Consumption Survey¹ of 1999 identified, among other parameters, the foods most commonly consumed in the country by type and amount, and paved the way for the statutory fortification of maize and wheat products. The legislation was enacted in April 2003 and implemented in October of the same year.² Thanks to the tireless efforts of many role players in government, academic institutions and the food industry, South Africa became one of the many developing and developed countries that have implemented food fortification as a means of addressing micronutrient deficiencies (Ireland being the latest developed country to adopt this approach voluntarily).³

Food fortification, however, should not be seen as the only strategy for addressing micronutrient deficiencies; it should rather strengthen and support other direct and indirect interventions such as nutrition education using the Food Based Dietary Guidelines, improving food security and dietary diversity, high-dose vitamin A supplementation, promotion of vitamin A-rich food gardens (where appropriate and sustainable), introduction of new crops, use of indigenous foods, school feeding, the promotion of exclusive breast feeding, poverty alleviation, and other public health interventions (e.g. control of malaria and intestinal parasites, and measles immunisation).⁴

Success of the food fortification programme will invariably depend on maintaining and improving the many factors associated with long-term successful food fortification programmes in industrialising countries,⁵ which typically include: political will and support; adequate data on micronutrient malnutrition and food consumption patterns; support from local industry; expertise in fortification technology; a multi-sectoral approach; legislation; facilitative regulations and resources; human resource training in industry and in public health and food safety sectors; appropriate fortification levels; fortificants which have good bioavailability; information, consumer education and communication campaigns; minimal cost increases to the consumer; and pertinent labelling information.

Another major requirement for ongoing success of the current food fortification programme is its monitoring and evaluation,⁵ which should also be mandatory and include: confirmatory data that vulnerable and low-income groups consume the fortified foods; feedback and corrections to make the programme more effective; and ensuring that the levels of fortificants continue

to be well below inappropriately high levels of intake, as well as that fortificant levels are adapted to take into consideration any changes in dietary habits, the use of supplements, and the consumption of enriched foods. The costs for such a monitoring and evaluation programme should never be overlooked, and should form an integral part of the total cost of the food fortification programme.⁶

In this context, the study by Modjadji *et al.*⁷ in this issue of the *SAJCN* is both timely and welcome. Although, as the authors correctly point out, this longitudinal study only investigated a small number of non-pregnant women in the Dikgale demographic surveillance site (a rural area in Limpopo Province), it is nevertheless important in that it provides probably the first indication that the food fortification programme might have improved the folate status of the population studied. Certainly, the results (which will need to be confirmed in larger-scale studies) indicate an improvement in the folate status of the subjects, but no meaningful or consistent change in iron status, and – rather disturbingly – a 5% increase in the prevalence of inadequate vitamin B₁₂ status.

The findings on folate and iron status are in line with international experience.^{8,9} The increase in the prevalence of inadequate vitamin B₁₂ status was not statistically significant and may be seen as an incidental finding in a very small number of subjects having an inadequate vitamin B₁₂ status ($N=5$ pre-fortification and $N=9$ post-fortification; the mean value of serum vitamin B₁₂ in the pre- and post-fortification observation points remained in the normal range). This finding, nevertheless, also needs to be confirmed in larger-scale studies, but it should certainly not be ignored since, in the longer term, it may be related to the improved folate status of the subjects, especially if these subjects were consuming folic acid supplements, which the authors of the study apparently did not investigate. High intakes of folic acid from fortified foods, and the consumption of supplements containing folic acid on a regular basis, may have the potential of masking vitamin B₁₂ deficiency,¹⁰ especially in the elderly, in whom¹¹ a poor vitamin B₁₂ status in the presence of high serum folate levels has been associated with anaemia and cognitive impairment. The concern that a high folic acid dietary intake (from food fortification and folic acid-containing supplements) may mask vitamin B₁₂ deficiency should be borne in mind at all times. Current opinion would appear to indicate that, at present and provided that

daily folic acid intake does not exceed 1 000 µg, there is no consistent evidence to support (at least in the short term) the contention that deterioration in vitamin B₁₂ may occur following staple food fortification with folic acid *per se*.¹²⁻¹⁴ In the case of the subjects in the study by Modjadji *et al.*⁷ the consumption of folic acid-containing supplements would be ill-advised and, certainly in time, the composition of multivitamin supplements in relation to their folic acid and B₁₂ content would probably need revision at the national level.

The interesting findings of Modjadji *et al.*,⁷ as the authors suggest, will be afforded national perspective by the report of the National Food Consumption Survey-Fortification Baseline (NFCS-FB) due to be released by the Minister of Health. In the meantime, it would appear that the benefits of the Department of Health's food fortification programme in respect of a water-soluble vitamin might well have begun to accrue. In terms of other clinical outcomes, one would be interested to see the effect of the programme on the prevalence of neural tube defects – a common problem in the country (D Bourne, personal communication). Hopefully, the international experience of a decrease in the prevalence of neural tube defects by 31 - 46% (in Chile¹⁵, the USA¹⁶ and Canada¹⁷), following the introduction of food fortification with folic acid, will also be realised in South Africa.

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