Editorials

Mandatory fortification of flour with folic acid: an overdue public health opportunity

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→ Next article in this issue
→ Previous article in this issue
→ Contents list for this issue
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The scientific benefit is clear, but translating this into practice requires advocacy

Fourteen years ago, randomised controlled studies in the United Kingdom[1] confirmed observational studies from Australia,[2] the United States,[3] and elsewhere, showing that an adequate intake of folic acid by women at around conception prevents most neural tube defects in their babies.[4] These three countries now (i) have government-sponsored public health campaigns which encourage women of childbearing age to increase their daily intake of folic acid; (ii) have food standards permitting the food industry to voluntarily add folic acid to cereal and other foods; and (iii) have health benefit claims related to the prevention of birth defects. In 1996, the US (along with Canada) introduced mandatory fortification of virtually all wheat flour products. Despite recommendations by the National Health and Medical Research Council in Australia and other scientific bodies and scientists in the UK, mandatory fortification has yet to be introduced in these countries.

Why should this be?

After mandatory wheat flour fortification in the US, median serum folate levels in non-pregnant women of reproductive age more than doubled.[3] Mandatory fortification has resulted in a 30% reduction of neural tube defects, or 1000 fewer cases every year.[2] Each case of spina bifida prevented saves an estimated US$500 000 in lifetime costs.[5] Even so, more could be achieved in the US compared with other countries where mandatory fortification requires higher amounts of folic acid to be added to flour than in the US.[6] Examples include Canada[7] (50% reduction in neural tube defects) and Chile[8] (70% reduction). It is well past the time that the Australian and the UK governments should have drafted food standards with sufficient folic acid to provide 400 μg of synthetic folic acid a day to women of child-bearing age.

In Australia, while the number of preventable cases (about 500 a year) has been reduced by voluntary fortification,[2] this has not occurred across all of society, with resulting inequities.[9,10] The reduction of cases of lifelong disability from neural tube defects has largely resulted from antenatal detection, with pregnancies being terminated (now the leading cause for late-stage termination of pregnancy in Australia and the UK).

Preventing 500 neural tube defect cases each year in Australia would relieve the huge time commitment, financial cost and emotional burden from not only the affected individual, but his or her network of family, friends, work colleagues and other associates and caregivers. In the 10 years since we have known how to prevent neural tube defects, this would have meant 50 000 highly affected people in Australia alone.

Folic acid fortification of flour is cheap — less than 0.1% the cost of flour (ie, less than 20 cents Australian per ton of flour). As thiamine is already a required additive, the costs of preparation and of administering quality control of the process, as well as of changing the labels on some foods, are small. Some millers and grocery companies in Australia do not favour mandatory flour fortification because they fear loss of market share for already fortified foods. However, a number of the largest milling companies, including Allied Mills and the Manildra Group, have publicly stated their support for mandatory flour fortification.

The mandatory fortification of flour in the US not only prevents neural tube defects, but has also brought a wider benefit to the population, especially to older people beset with chronic and degenerative diseases. The exact degree of this benefit is still being defined, but current evidence indicates the increase in serum folate concentrations in the population is sufficient to prevent almost all folate deficiency anaemia.[7] The association between lower risks for heart attack and stroke with lower homocysteine concentrations has been established.[7] Since mandatory flour fortification with folic acid in the US, there have been about 17 000 fewer heart attacks and 31 000 fewer strokes.[7] In addition, several recent scientific articles have credited folic acid supplementation with protection against loss of cognitive function in the elderly and Alzheimer's disease,[11] and against several cancers (including neuroblastomas).

The benefits described above are clear and significant, but what are the perceived risks? One is the possibility of masking pernicious anaemia (the result of vitamin B_{12} deficiency) in the elderly and evolution of its neurological manifestations. Mild forms of dietary vitamin B_{12} deficiency in the elderly do occur, but there is no relationship between folate and vitamin B_{12} deficiencies. A second perceived risk is an increased risk of certain cancers, such as colon and

breast cancer; however, there is mounting evidence that the overall risk of cancer is reduced, as the genome is less stable and at higher risk of mutagenesis when people are deficient in certain micronutrients, including folic acid.[12]

Since the US first demonstrated the benefits of flour fortification, more than 40 countries around the world have made it mandatory.[13] Recently, leaders from over 50 key organisations formed The Flour Fortification Initiative, a United Nations-registered public, private, and civic alliance in support of the UN Millennium goals. With Australians in the forefront of this global movement, it is time that Australians at home also gain the benefit of this substantial public health measure.

If there were a toxin (such as lead and mercury) or an infectious agent (such as the mad cow product) in the nation's food supply, action would be swift and decisive. The ethical issue here is not what harm the mandatory fortification of flour with folic acid would do; rather, it is the harm inflicted each day that fortification is delayed by those who know how to prevent the damage from folic acid deficiency.

In 2005, The National Institute of Clinical Studies Evidence-Practice Gaps Report[14] identified mandatory folate fortification of flour as a key issue, and the Australian, New Zealand and UK governments will decide for or against this measure during the next 6 months. If the medical community will not rally and become advocates for this public health issue, who will? And at whose expense?

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