

Response from Geoffrey Cannon

Ouch! Woe! I reply in a personal capacity to this *donner* of evidence *und blitzen* of citations, after reading a review in a sister journal. This says of mandatory fortification of food supplies with folic acid: 'Fetal adaptations to a high-folate environment may interfere with folate metabolism postnatally, with serious consequences for the epigenetic regulation of gene expression'¹. Decrypted, this means that a foetus receiving pharmacological doses of folic acid by way of the placenta may therefore be programmed once born to need folate at levels not found in normal diets. The result could be a quasi-drug induced deficiency state. This, the author suggests, might be one reason for the rapid recent tenfold increase in autism in the USA, and might contribute to various forms of psychiatric illnesses which altogether in the UK alone cost the economy an estimated £77 billion a year. Blimey!

Somebody prepared to unleash the demons of sensationalism might therefore say, with some backing from cell biology, animal experiments, human observation and intellectual effort, that folic acid fortification drives you nuts.

On neural tube defects (NTDs) specifically, I had the impression that the main issue was and is not mainly congenital inability to metabolise folic acid, but lousy diets very low in fresh foliage and other sources of folate². In this context the MRC trial³ that is the basis for national policies to fortify food supplies has turned out to be troublesome. In order to get a result, and presumably on the assumption that water-soluble vitamins are harmless at pharmacological doses, the pills that did the business were 4 mg of folic acid a day, whereas it's hard to construct diets containing more than a daily 500 µg of folate. 'Cleansing' regimes made up almost entirely of fresh fruits, salads, and mounds of lightly cooked greens and other vegetables, don't go much above 1 mg a day, and armed with a steamer Popeye would be pressed to get above 2 mg a day. So the opportunity to find out whether diets naturally rich in folate, corresponding to those recommended to prevent chronic diseases, prevent NTDs was lost.

In general, what are the implications? Certainly, as Mark Lawrence says, that the impact of fortification of food supplies needs to be monitored thoroughly and imaginatively by investigators on the lookout for biologically plausible bad news.

But food supplies are fortified with all sorts of 'goodies', including trace elements like iron and zinc known to be antagonistic and toxic above low thresholds – not to mention selenium and fluoride, once identified only as toxic 'baddies'. Was it a mistake that people in the UK still live with, to fortify white flour and thus bread with calcium at levels above those found in wholegrain bread? Is the whole UN System/Gates Foundation endeavour to fortify the food supplies of impoverished countries, including by adding vitamins and minerals to highly processed fatty, sugary or salty foods and drinks, going to turn out to be a double pathogenic whammy?

One query for Mark Lawrence. He uses the term 'synthetic folic acid'. Is this a hint that the substance itself, irrespective of dose and interaction with other nutrients, might be problematic, and if so, what are the implications for all other synthesised nutrients used as supplements and fortificants? Or, to ask the question another way, is there any evidence that unusually high consumption of folate from foods, as say in whole-food vegetarian diets, could do any harm?

The view that supplementation and fortification with bioactive compounds is typically good for public health, and actually and potentially restores the health and saves the lives of millions of people each year, is very deeply entrenched. But is this altogether true? Maybe it's time for a radical rethink.

Geoffrey Cannon

Juiz de Fora, Minas Gerais, Brazil
Email: GeoffreyCannon@aol.com

DOI: 10.1017/PHN20062004

References

- 1 Sugden C. One-carbon metabolism in psychiatric illness. *Nutrition Research Reviews* 2006; **19**(1): 117–36.
- 2 Cannon G. Vitamins and minerals: the case of the disappearing (spinal) column [Chapter 5]. *The Politics of Food*. London: Century, 1987.
- 3 MRC Vitamin Study Research Group. Prevention of neural tube defects: results of the MRC Vitamin Study. *Lancet* 1991; **338**(8760): 131–7.