

Folic acid

Mass Medication or Mass Nutrition The role of Fortified Foods, why do we need fortification at all?

by James Cooper, MAG Contributor

The idea of adding nutrients to food, for the greater good of a population, is nothing new. Across the world we've been doing it for over a century. Staple foods that have been processed and refined, such as maize, flour and rice, constitute such a large proportion of our diet that, to many governments, it makes sense to consider if they lack particular nutrients and then simply replace those nutrients lost during processing.

It's a practice which is especially relevant if the food was a good source of a nutrient in the first place, before any processing.

But we can also put other good stuff in: The same staple foods are also a convenient vehicle for administering targeted micro-nutrition where there are deficiencies created by poor diet that can lead to specific health problems in vulnerable groups.

Salt, sugar, oil and milk are all used as a vehicle for fortification in certain parts of the world where nutritional deficiencies have been identified.

Very few industrially produced raw foods escape processing in some form or another. Milk is pasteurised for example, salt can be iodised, water fluoridated, so we are quite accustomed to this sort of interfering on our behalf.

It's out of our hands, but we accept it as a beneficial and civilised improvement of our basic foods.

One size fits all

Fortification however, tends to be a one-size-fits-all. Different communities in different parts of the world will have differing diets, food diversity, crops, climate, lifestyles and any number of other factors that will affect their nutritional needs.

Adding anything new to the recipe will always bear scrutiny and this is where fortification can sometimes divide opinion. It's the antithesis of choice, but we must choose. The binary decision to fortify then applies to all, regardless of whether they stand to benefit or not. As such it can be perceived by some as a blunt instrument. The concept is an all or nothing fix, but also one with far reaching outcomes.

Take salt for example, one of the most frequently used ingredients in food.

Iodine deficiency is a major public health problem that can be cheaply addressed by purposely adding small amounts of iodine to sodium chloride salt.

Salt was first fortified with iodine in the US during the 1920s to prevent goiter (abnormal enlargement of the thyroid gland) among Ohio schoolchildren. And many countries have since passed laws that salt must be iodised for human consumption. In fact, the UK is one of the few European countries without regulations on salt iodisation. Yet iodine deficiency still affects about two billion people worldwide and is the leading preventable cause of intellectual and developmental disabilities.

Fortification of flour

In the UK flour is an obvious vehicle for fortification, it has the highest consumption rates across any group of the adult population, with an estimated 90 percent of people consuming products that contain flour¹.

Flour fortification first became commonplace during the First and Second World Wars to help prevent nutritional deficiencies within the population, during a period when diets were otherwise rather limited in their nutritional diversity.

When white flour was first fortified with calcium in 1941, it was introduced to prevent rickets, found common in women joining the Land Army. Fortifying flour, therefore, was a means of providing more calcium in the diet at a time when dairy products were scarce.

Since then, fortification has been enshrined into UK legislation through an incremental process. The National Loaf, introduced during the Second World War by the Federation of Bakers, was a bread made from wheatmeal flour (a bit like brown flour) but with added calcium and vitamins.

It was needed to deal with wartime shortages of flour caused by limited merchant shipping, which, in 1942, was mostly imported at that time. This coarse and bran-rich flour produced a loaf which tended to be dense, gritty and bland tasting, but was also surprisingly nutritious, giving the allies enough vigour to go ahead and win the war.

The loaf was finally abolished, much to the relief of most who had consumed it, and controls on the milling of white flour were lifted in 1953. But it left a nutritional void because there was a naturally higher presence of vitamins and minerals in whole grain

used to make it. So, regulations were introduced to add iron, thiamin and niacin, and to continue the addition of calcium in all wheat flour (except wholemeal).

And that's pretty much where we are today, here in the UK, with the exact quantities of these basic four nutrients enshrined in the UK's 'Bread and Flour Regulations 1998.'

A choice for 'real bread'

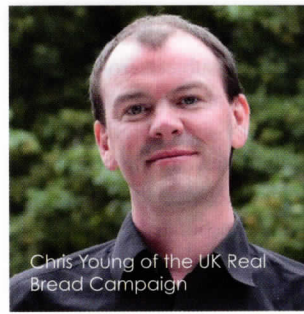
Today, 84 countries worldwide fortify milled grains as a means of providing a base level of essential nutrition and worldwide. It is now generally accepted as an essential component in prevention of diseases created by malnutrition. (source, FFI).

Here in the UK fortification does however, have some quite vocal detractors, mainly amongst food purists, but some food pressure groups continue to question the relevance of fortification describing the concept as adulteration of raw ingredients with mere 'token' nutrients.

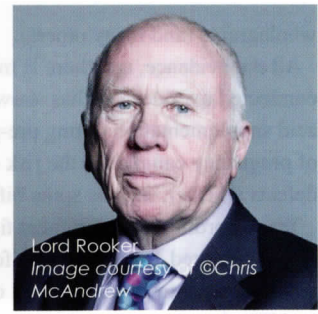
Chris Young from Sustain's Real Bread Campaign offered me his opinions on the subject. He believes that everyone has the right to choose to eat real bread, that is to say, made without the use of any so-called processing aids or other artificial additives. So, from one perspective fortification is mass-nutrition, from another it's contamination. Or worse, mass-medication.

Unfortunately, malnutrition, particularly in lower socio-economic groups, is as much a problem today as it ever has been and one that is increasingly hidden.

Perversely, many populations across the world now live in an environment of over-consumption, where calorie intakes are exceeding energy expenditure and where intakes of some micronutrients (such as iron, folic acid and Vitamin D) in several populations are reported to fall below recommendations².



Chris Young of the UK Real Bread Campaign



Lord Rooker
Image courtesy of Chris McAndrew

In the USA, a 2018 study at The University of Chicago Booth School of Business, researchers developed a Health Index to measure the nutrition content of households' grocery purchases. The index improved five times more for high-income households than it did for low-income households between 2012 and 2015, compared to 2004 through 2007—indicating the nutritional gap between the rich and the poor is growing, even in richer countries.

So, the broader perspective, which is generally accepted by governments, is that food fortification should be used by to improve health and wellness across a broad spectrum of the population, even if only a subset of a population needs the additional nutrition, and especially if used to target specific nutritional deficiencies leading to avoidable health issues such as congenital disorders.

The UK's Great Folate Debate

Vitamin B9 is an essential nutrient that's mainly present as folate and folic acid.

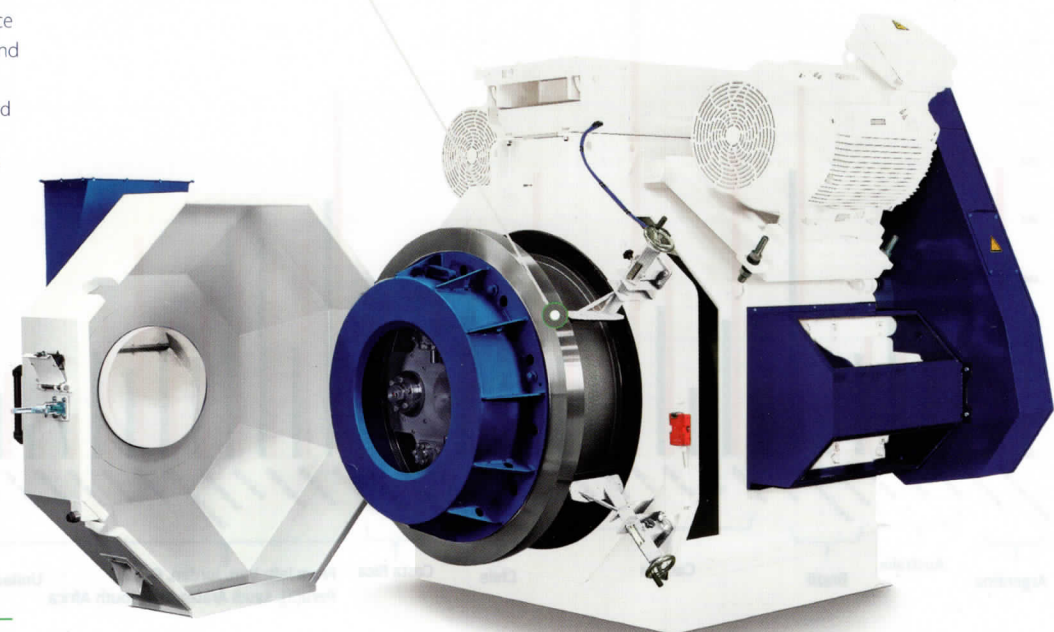
Folic acid is a naturally occurring nutrient found in abundance in certain foods such as spinach, marmite and liver, brassicas,

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wholegrains (and many others).

All the evidence, and there is much on the subject, from trials conducted over decades has shown beyond any doubt that folic acid supplementation during pre-pregnancy and the early stages of pregnancy can reduce the risk of a fetus developing neural tube defects (NTDs), such as spina bifida and anencephaly².

Yet, according to government figures, an estimated 90 percent of women aged 16 to 49 have a folate status below the level recommended to reduce the risk of having a pregnancy affected by NTDs³.

The National Diet and Nutritional Survey UK (2017) has also indicated that mean red blood cell folate was lowest in socio-economically deprived areas. It's an obvious candidate for fortification because one of the main challenges in supplementation is that nearly half of all pregnancies are unplanned, so women will not necessarily supplement diet until it's too late.

While some foods such as breakfast cereals are voluntarily fortified with folic acid, these fortified foods are not routinely consumed by all sections of the population and may not reach women from the most deprived areas on lower incomes, who also tend to have lower intakes of naturally occurring folate⁴.

Slow to react

The UK government has received positive advice from its own Scientific Advisory Committee on Nutrition (SACN) in favour of mandatory fortification, but so far has been slow to act on the advice. This, despite a groundswell of support from numerous other advisory bodies for a proposal that has been gaining traction in the UK now for over 10 years.

The launch of a government consultation in the matter was

initially announced by the Minister for Public Health, during Spina Bifida and Hydrocephalus Awareness Week in October 2018 and initiated in June 2019. Since then, however, there has been limited progress.

A huge response returned from milling industry bodies, nutrition agencies and medical organisations. Most recently, in March 2020, the Royal College of Nursing published a consensus statement supporting the mandatory fortification of flour with folic acid. The statement, supported by The Royal College of Midwives, The Royal College of Obstetricians and Gynaecologists, British Medical Association, British Dietetic Association, (to name only a few) makes their position clear:

“It has been decades since the benefits of introducing mandatory fortification [of folic acid] have been known and the delay in introducing this measure has led to stillbirths, neonatal deaths, disability and avoidable terminations of pregnancy..

We urge the government to implement this measure without delay.”

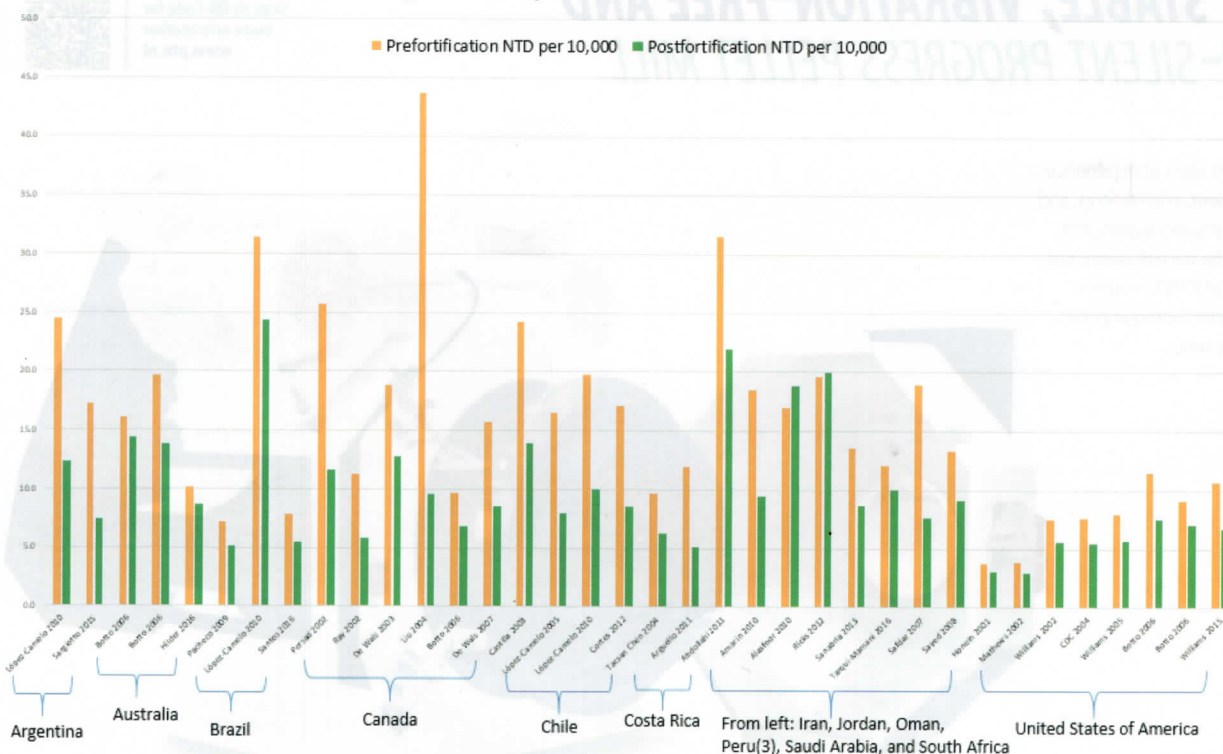
Staggering reductions

It's quite puzzling. Across the world and over the course of around 20 years, over 80 countries have adopted folic acid as a mandatory fortificant to wheat, rice and maize, but not yet the UK. Results from fortification programmes in the Arab Gulf region, and beyond, demonstrate the effectiveness and the public health benefits arising from mandatory food fortification.

Since introducing the obligatory addition of folic acid to wheat flour in 1996, Oman has reported a staggering 70 percent reduction in cases of Spina Bifida⁵.

Mandatory fortification of cereal grain products with folic acid began in the USA in 1998, contributing to a 36 percent reduction in NTDs between 1996 to 2006: preventing an estimated 10,000

Neural Tube Defects (per 10,000): Pre and Post Flour Fortification with Folic Acid



A review of 36 documents that reported the prevalence of NTDs per 10,000s births* before and after the initiation of flour fortification with folic acid in 13 countries.

*The denominator can include live births, still births or terminations.

NTD-affected pregnancies in a decade, and resulting in a savings of US\$4.7 billion in direct costs⁵. Recent evidence from the USA-based Food Fortification Initiative (FFI) makes the worldwide case for folic acid even more transparent.

So, given all we know on the subject, why then is the UK Government still unable to commit to a timescale for implementing folic acid fortification?

Whilst this is primarily a public health issue, I wondered if the director of UK Flour Millers, Alex Waugh, was able to offer a milling industry perspective: “It’s a charged issue as far as customers and consumers are concerned.

“Initially I think there were some concerns about potential adverse effects in some other groups. But they seem now to have been addressed. The medical consensus is that it would be beneficial. But at the same time, there’s quite a public mood, which may be changed because of the events of the last year, against the idea of what would be described as sort of medical intervention, into mass medication.

“It’s the kind of terminology that people would use, the language is emotive, but if you substitute nutrition for medication it doesn’t sound quite so bad: Mass nutrition sounds like a good thing. Right now, if you talk about vaccination-mass-medication, it doesn’t sound too bad actually.”

Certainly, food additives have had a bad name.

There is also quite a public mood, Alex explained, which may be changed because of the events of the last year, “... against the idea of what would be described as medical intervention,” explained Alex Waugh.

In the food world there is definitely a trend towards clean label and anti-processing, whole foods and organic status.

“People don’t like the look of anything added to their food and regard everything added as bad, even though it might benefit them”, he added.

From this perspective, folic acid is just another ingredient on the bad list, even though it is simply just another naturally occurring nutrient.

Alternative to fortification

The UK’s food lobby group Sustain is an alliance of organisations, including the Real Bread Campaign. It is set against any mandatory fortification and instead campaigns for a healthy and sustainable food system.

Whilst not specifically taking a position on folic acid, Sustain refers to ‘so-called fortification’ of UK milled flour as a ‘sticking plaster’ approach, which, they argue, fails to address the underlying reasons why some people are living with, or are at risk of, nutritionally deficient diets in the first place.

It is instead advocate of alternatives to fortification that might improve folate / folic acid uptake, such as improved cooking and healthy eating education in schools, raising minimum levels of naturally occurring folate (and other micronutrients) in flour and schemes to make healthier food more affordable and accessible, whilst curbing promotion of less healthy foods.

Sustain would also like to see tighter regulation of bread baking methods with the aim of increasing natural nutrient content and are lobbying for a range of measures to be implemented such as increasing investment in cereal breeding research, with the aim of increasing micro-nutrient density, rather than just yield and protein levels.

It has called for a wholesale review of industrial milling techniques in order to retain higher levels of these naturally occurring micro-nutrients, an argument which is based on the popular belief that traditional stone mill wheels grind grain more gently and at a lower temperature than large industrial roller



mills.

These are certainly commendable aims, but whether these measures are credible or realistic, or simply distractions, remain open to debate.

For example, milling research shows that stone mills generally operate at much higher temperatures than roller mills – as high as 90°C/194°F for stones vs. 35°C/95°F for roller mills. Roller mills work so efficiently that the flour they produce is held at top temperatures only briefly, while stone mills take longer to reduce the grain to flour particles (that could also explain why some data shows stone-milled flour having greater loss of amino acids and healthy fats)⁶.

Are consumers convinced?

And so, the folate debate comes back to the fundamental issue: The polarising nature of fortification.

Despite compelling evidence of the public health benefits of folic acid fortification it may be that consumers are still not convinced, so politicians are weighing both real and perceived arguments. The real challenge for politicians, and the argument, is that the group of beneficiaries, that is people involved in pregnancies that might be affected by NTDs is relatively small.

The Rt Hon Lord Rooker was Chair of the UK’s Food Standards Agency (FSA) between 2009 until 2013 and at age 79, rather than taking it easy, remains a powerful voice in the House of Lords.

He has been raising the issue of folic acid in parliament regularly since leaving his ministerial post at the FSA, pressing the government for a decision on what he now considers an urgent matter.

On June 30, 2015, Lord Rooker introduced the House of Lords Bill to amend the Bread and Flour Regulations 1998 to require flour to be fortified with folic acid. But as yet, he explained, the government has still not released the result of the 2019 consultation. He raised the issue again in September last year but decided to wait due to the Covid situation and has undertaken to raise again at Lords questions on 23 March 23, 2021, just three days after World Flour Day

In his candid email, Lord Rooker said The Department of Health (DoH) had previously considered the problem to be relatively small in terms of incidences of NTD: That “1000 pregnancies affected each year and an average three live NTD births a week,” which had in the past been managed by pregnancy termination. “That is lot of terminations,” he noted.

And devastatingly, termination is not even a part solution: NTD can also result in miscarriage, death shortly after birth or long-term disability to the baby of varying severity. The true number of affected pregnancies is probably higher because some women will miscarry before diagnosis and some very minor cases of spina bifida may remain undetected³.

Pressure to fortify can only increase

Few would disagree that prevention is better than cure. Or in this case, better than elective termination after prenatal diagnosis. But nor is folic acid a panacea or cure-all. Does this tragic moral and political impasse really boil down to a choice between fortification and termination?

Sustain is of course absolutely right. We should be controlling the over-processing of foods to preserve nutrient content, and we would all certainly benefit from eating more whole grains and fermented breads that contain naturally higher levels of all the good stuff, not just folate.

But unfortunately, Sustain are largely preaching to the converted. Dietary education should and must be a priority for the health of our nation but increasing intakes of essential nutrition through diet alone is hard to mandate and education takes years to change behaviour.

If folic acid is to be introduced then it will likely be under existing legislation, in which case all wholemeal flours (those above 85 percent extraction) and those produced by small-scale artisan mills are likely to be excluded from the rules.

The Real Bread Campaign may be able to have their cake and eat it.

With worldwide populations expected to reach 9.5 billion by 2050 with a greater reliance on milled grains for nutrition than ever before, focus on fortification can only increase.

We live in a world where we are reliant on industrially milled grains for the greater part of our nutritional intake. Food poverty and malnutrition are rising statistics: That's why we need fortification.

As it stands, UK government has largely ignored acting decisively in relation to this preventable congenital anomaly and has applied no sense of urgency to the prevention of NTDs. There has been a global race to vaccinate older populations against Covid19, but should we now also be taking this opportunity to take care of those at the other end of their lives, the younger pre-generation? If ever there were a time to grasp the nettle, is that time not now?

References

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