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Volume 4, Number 3, March 2013

Journal of the World Public Health Nutrition Association
Published monthly at www.wphna.org

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Editorial. Micronutrients

Go forth and fortify



The past. Vitamins #1. Yes, these vintage advertisements are for real. Fortified donuts put pep into children, and fortified housewives put pep into husbands

The Global Alliance for Improved Nutrition (GAIN), a ‘public-private partnership’ mainly funded by the Gates Foundation, with support from the US Agency for International Development (USAID), has a stated overall aim. ‘to reach 1 billion people by 2015 with nutritious foods that have sustainable nutritional impact’ (1).

Cite as: Anon. Micronutrients. Go forth and fortify
[Editorial] *World Nutrition* March 2013, 4. 3, 88-94

Yet the main work of GAIN is the ‘fortification’ of food products with synthetic vitamins and other nutrients, and to a lesser extent micronutrient supplementation. This work amounts to 76 per cent of its current annual \$75 million budget. Commitment to nutritious foods and to improved agriculture amounts to 11 per cent (2). Why? GAIN has as its ‘business alliance’ members, transnational corporations that manufacture pharmaceuticals and synthetic vitamins, such as BASF, GSK, and DSM, and ultra-processed food products, such as Unilever, Coca-Cola, PepsiCo, Kraft, and Mars. Why? And are these two questions related? Read on please.

Good Things

Denis Burkitt, the champion of dietary fibre (3), was often asked about the relative merits of food and supplements – he recommended wholegrain bread and potatoes with their skins, and also wheat bran (4). He always said ‘Prefer good food, to bad food plus pills’. He might have added, ‘powders or potions’. Hold this thought please, as introduction to the two commentaries in *World Nutrition* this month (5,6).

1066 and All That, a satire on English history as taught, has amused readers since first publication in 1930. A prelude to *Monty Python’s Flying Circus*, it claims to include 103 Good Things. Thus, the Roman Conquest, the Church of England and Magna Carta are Good Things; and more subversively, Good Things also include scandals and outrages such as the South Sea Bubble, the Enclosure Acts, and the Indian Mutiny.

An underlying message of all good satire is, Think Again. Take antibiotics. We have all been brought up to be sure that they are a Good Thing. We have all heard how in the old days, physicians helplessly stood by and watched their patients die, whereas... It is likely that everybody reading this has literally taken antibiotics at some time, for serious or trivial bacterial infections, or ‘just to be on the safe side’. And yet now medical authorities are panicking because deaths from ‘superbugs’, multiply-drug resistant infections created by typical gross overuse and abuse of antibiotics, are rocketing (7,8). In the USA, every year around 100,000 people die from hospital infections, many multiply-resistant. Hospitals are reverting into pest-holes. This does not make antibiotics inherently a Bad Thing. Like hand-guns, when used carefully when really needed, they are life-savers. But there is a rational case to say that in general, antibiotics now do more harm than good. Hold this thought also please.

So now, vitamins. We have been brought up to believe that the discoveries of vitamins and their properties were the nutritional equivalent of the ‘discovery’ of the Americas. As with antibiotics, nobody would maintain that vitamins are inherently a Bad Thing. Vitamins are vital for health and life itself. A hard-line naturopath would not deny the need for vitamin supplementation to treat severe deficiency states. It is certain that the use of synthetic micronutrients has saved the lives and restored the

health of countless people, young children especially. You may well literally take vitamins also. Most US adults take a multivitamin pill every day.

We may smile at advertisements from the ‘golden age’ of vitamins, like those above, one claiming that donuts ‘fortified’ with vitamin B1 (thiamine) will put pep into children, the other insinuating that ready-to-eat Pep ‘fortified’ breakfast cereal (then sponsor of the Superman radio series) will put pep into housewives and husbands coming home ready for dinner and passion. But we all believe in vitamins, right?



The present. Vitamins #2. These ads are real also. Fortified sugared water puts pep into yuppies and fortified sugared cereal puts pep into children

Besides, advertisements claiming that vitamins give pep are not a thing of the past. See the pictures above. The one on the left is for Vitaminwater™, which essentially is sugared water plus all sorts of herbal and other extracts, plus vitamins. Coca-Cola paid over \$US 4 billion (billion) in 2007 to own the brand. It is a big business. As explained at the time of the sale: ‘Each bottle promises a specific benefit. Kiwi-Strawberry flavored Vitaminwater, for example, promises “focus” and “healthy support for eyes and skin”... There is also a Vitaminwater with green tea extract, which promises to “rescue” because of its purported cancer-fighting properties’ (9).

Sugared breakfast cereals are also big business. As summarised by Wikipedia, ‘The breakfast cereal industry has gross profit margins of 40-45%, 90% penetration in some markets, and steady and continued growth throughout its history’. Globally the industry is now worth around an annual \$US 30 billion, projected to rise to \$US 35 billion by 2015. The version of Frosted Flakes promoting vitamin D shown on the right, above, was featured by Kellogg’s at last November’s Latin American Nutrition Societies (SLAN) conference in Havana, Cuba. Like many other breakfast cereals made by leading manufacturers aimed to attract children and their parents, its main ingredients are corn, sugar and salt. With 12 grams of sugar in a 130 calorie serving, it is 30 per cent sugar. It is ‘fortified’ with a range of vitamins and minerals.

So is Vitaminwater™ and are sugared breakfast cereals marketed to children, Good Things? Commercially yes, and enterprises that keep the wheels of commerce turning are sources of employment and revenue. But if the question is expressed differently, as say ‘Are ultra-processed sugary products advertised as healthy because they are “fortified” with vitamins a Good Thing?’ the answer from a public health view is more likely to be no. True, it depends to some extent on the options. Is Vitaminwater™ a healthier choice than, say, a cola drink, or a vodka? Yes. Are sugared breakfast cereals less unhealthy choices than, say, white bread and margarine (10) or no breakfast? Yes.

But there are other choices, and there is an insidious difference. These ‘fortified’ products are advertised as if they are healthy, and overall they are not. Health claims are made possible not because of sugar (10), but because of ‘fortification’ with synthetic micronutrients. So questions include: Are vitamins as used to promote ultra-processed products, a Good Thing? And: Is ‘fortification’ of unhealthy products, in ways that distract attention from the vitamins and other nutrients naturally present in fresh and minimally processed foods, a Good Thing? If such questions were debated, there would be some votes for no.

Vitamins are essential



The present. A total of 44 million sachets of Vitalita™ multi-vitamins and minerals have been distributed by aid agencies to children in Indonesia

But what about fortification and supplementation of foods in impoverished countries, to guard against disease? Would the world now be a better place if vitamins had never been discovered? The answer is obviously and emphatically no. For a start, there are the series of deficiency diseases that are prevented or treated with micronutrients. Most of these have turned out to be relatively unusual, and confined to populations or groups consuming grossly inadequate or unbalanced diets. But some, such as goitre, are examples of when fortification, in this case of salt with iodine, is crucial. Others, such as vitamin A shortage or deficiency, are generally (11)

but not universally (12) believed to be very widespread. Spina bifida and other neural tube defects are caused by deficiency in folate, the B vitamin which in synthetic form is folic acid, prevented by fortification of food supplies, as stated in one of this month's *WN* commentaries (5). All over the world the diets of vulnerable populations are supplemented or fortified with combinations of micronutrients.

Think again



Appealing, yes? Pictures of small children in Latin America and Asia, bowls at hand, used to promote sales of food fortificants by a transnational corporation

Now please think again. A story sets the scene. In the early 2000s, as the second World Cancer Research Fund/ American Institute for Cancer Research report (13) was being prepared, its panel of scientists made an important decision. The previous report had examined evidence of the role of vitamins and other micronutrients in modification of the risk of cancer. The new report has a different approach. It separates the role of micronutrient supplements, which in strong doses can be troublesome, from micronutrients as contained within foods, which when separable are probably or maybe beneficial.

That is to say, the issue is not vitamins and other micronutrients as contained in food. Of course these are beneficial and indeed essential for health and life. That's not the issue. The issue is, what is the source of vitamins? Food? Or contained in pills, potions or powders, and if so, in what doses?

Synthetic vitamins, as used in animal feed, human food, and in effect as drugs, are big business. Most are cheap. Production of vitamin C, now mostly manufactured in China, is around 110,000 (one hundred and ten thousand) tonnes a year, mostly for human use. Annual production of folic acid has risen in recent years from around 500 to around 4,000 tonnes a year, because of decisions made by some national regulatory authorities to 'fortify' flour and other foodstuffs with folic acid, and to encourage manufacturers of breakfast cereals to emphasise folic acid fortification on their packages (5). China is also the main single source of folic acid, with one plant alone manufacturing around 1,250 tonnes a year.

In Europe, the biggest manufacturer of vitamins is DSM. In 1902, the company started out as Dutch State Mines. In the 1980s and 1990s the Dutch government sold off its shares in the company, then already into chemicals. In its third phase Royal DSM, as now known, is a multinational corporation with 23,500 employees in 200 locations, with annual sales close to €10 billion. In 2002 the Swiss-based pharmaceutical company Hoffman-la Roche, until then the biggest manufacturer in the vitamin business, sold its vitamin business for €2.5 billion to DSM, whose positioning is as ‘a global, science-based company active in health, nutrition and materials’. Its slogan is ‘Brighter science, brighter living™’. ‘Health’ and ‘nutrition’ is mostly synthetic fortificants. DSM corporate promotion states ‘Every day half a billion people take DSM vitamins; but there are still 6.5 billion who never take any’. The two appealing pictures above, of children in Latin America and Asia with bowls in hand, are from DSM promotional literature.

It depends

Here are some related questions. Why are food supplies, most of all in low-income countries, said to be so very deficient in vitamins? Why do manufacturers of synthetic vitamins, supply much of these to manufacturers of ultra-processed products? Why do transnational corporations emphasise the importance of vitamins, in their products, and as fortificants of food supplies in impoverished countries? Imagine that all the human, material and financial resources used to ‘fortify’ food supplies of impoverished countries to ‘combat hidden hunger’, were instead used to empower the farmers and growers in these countries to become food-secure. Would they be better off, and would the world be a better place? Surely yes.

So, is the focus of GAIN on fortification and supplementation related to the fact that this approach does nothing to disturb the strategies of transnational corporations such as its business alliance partners, who are in any case ‘fortifying’ their own products and claiming that these are healthy?

The answers to big questions are usually nuanced, as the authors of *1066 and All That* knew. For sure, vitamins as contained in food, and knowledge of their functions, are a Good Thing. But it might have been better, all things considered, if while the functions of vitamins in foods were well understood, it had remained impossible to isolate and synthesise them. It might have been better if deficiencies were treated only with foods naturally extremely rich in relevant nutrients.

Given the alternative of self-sufficient food systems enabling sustained livelihoods for farmers and growers, it is within reason to say that as now typically overused and abused, synthetic vitamins do more harm than good. Yes, prefer good food.

The editors

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- 10 White bread and margarine are usually also ‘fortified’. Or, to be more precise, they are ‘enriched’, meaning that some of the nutrients lost in milling, or in comparison with butter, are restored. Health claims were made for sugar in the old days, as providing instant energy.
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Acknowledgement and request

WN editorials are reviewed by members of the editorial team.

Readers may make use of the material here if acknowledgement is given to the Association, and WN is cited. Please cite as: Anon. Micronutrients, Go forth and fortify. [Editorial]. *World Nutrition*, March 2013, 4,3, 88-94. Obtainable at www.wphna.org.

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