

Helping to fight the world's 'hidden hunger'

Nearly one in three of the world's population is undernourished in key vitamins and minerals, which makes nutritional fortification or supplements more important than ever, Sean Hargrave discovers.

- ▶ **Although the food security debate can often focus on the quantity of food a region can produce, there are other very important factors, such as quality and safety, enshrined in the UN's definition of food security.**



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In fact, last year a UNICEF report estimated that at least two billion people are currently not receiving all the vitamin and minerals they require for a healthy diet. Furthermore, it warned, one in three children in the developing world are 'ill equipped for survival' because of a lack of Vitamin A and globally one in four children, some 148m in total, are estimated to be suffering from under-nutrition.

Hence, the nutritional quality and affordability of food are just as important components of the food security debate, according to Rick Greubel, President Human Nutrition and Health at DSM Nutritional Products. The company is the largest producer of nutritional ingredients in the world and believes that fortifying food is an essential means of ensuring a growing global population can enjoy a diet with recommended daily intake of vitamins, minerals and other key micronutrients.

"Obviously you have to tackle the amount of food you produce because you have to fill people's stomachs," he says.

"However, even if you do ensure people are full and have a high calorie diet, they can still have what we call 'hidden hunger'. This is where they're eating sufficient quantities not to go hungry but they are not consuming sufficient vitamins and minerals and so they are under nourished.

"It's often down to people not having local access to food containing the right vitamins and minerals or not being able to afford it, or both. In many parts of the world there aren't the right conditions to grow food rich in a variety of vitamins and minerals and so fruit and vegetables tend to be imported and expensive. It's a huge challenge, particularly when fortification or supplementation are unaffordable."

Sachet success

It is for this reason that DSM has worked with the WFP (World Food Programme) to develop its MixMe sachets which are either sold at low cost or distributed free of charge in Africa, parts of Asia and South America.

"It's such a simple yet powerful idea," says Greubel.

"By sprinkling the contents of a tea bag-sized sachet on a bowl of rice or porridge the meal is fortified with no effect on its taste.

"In essence, that is the power of vitamin and mineral supplementation; a small amount can go a really long way. Just one kilogramme of Vitamin A is sufficient to fortify 10,000 servings of infant formula which is so important in the first two years of a child's physical and mental development. If they don't get enough at this

early stage you can't make up for it later on, their development will always have been held back."

Hence fortified foods play an important role in the developing world, as well as developed economies, in enabling food to be fortified with minerals and vitamins to add vital nourishment.

DSM has taken this notion a step further by developing rice fortification technology. Working with a rice milling business DSM has managed to take rice that would have been wasted during the process and put it back in to the bag and in to the food chain enriched with a mixture of minerals, vitamins and some other key micronutrients.

"When rice is milled it's quite normal for around 15% to be unsalable because the grains have split," explains Greubel.

"So we've worked with Bühler - the global market leader in food milling - on technology which takes the broken grains, which would otherwise be thrown away, and reconstitute them with a rich mixture of micronutrients which seals them back up again. The grain can then be added back in to the rice packets so the final meals made from them are fortified.



"This NutriRice is on sale in several countries where rice forms the bulk of the staple diet. It's very important for us because not only does it turn waste in to a very useful fortified product, it is also a commercial product. Obviously where there is great need you have to get nutrition out there but you need to turn that in to interdependence and then independence through fortified food or supplements that are sold at affordable prices. People becoming reliant on help is not a sustainable solution."

There is a possibility that NutriRice might one day be made available in the developed western world but for the time being the impetus is in making it available in developing countries where there is a reliance on rice to provide the bulk of the staple diet.

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Rick Greubel



Safety is key

While quality is an important part of the food security debate, safety is equally crucial, Greubel contends. In a debate that can often be, understandably, focussed on the quantity of food the planet is able to produce to feed an expanding population, a point that might be glanced over is that food has to be safe.

Many of the globe's biggest food scares have resulted from negligent, or even criminal, approaches to nutritional enrichment of human food or livestock feed and so Greubel believes food producers need to feel secure that nutritional ingredients are safe.

“Problems can arise if you don't stick exactly to the correct specification for each of the ingredients you provide,” he says.

“That is why we have set up our Quality for Life programme around the unique way we operate. We work throughout the whole chain from the raw materials right up to the final ingredient going to a consumer good manufacturer in a variety of forms and premixes. This combines with DSM offering the world's most complete range of vitamins and carotenoids.

“It means we have full traceability throughout the whole process which is good for giving food and feed companies the peace of mind they need to add our nutritional & health ingredients to their products without having to worry about quality issues.”

More with less

Greubel believes that ingredients do go some way towards helping solve the current global issues facing food production and an expanding population. As he sums up there are several trends which combine to make all those involved in food production ask some very fundamental questions.

“All over the world in developing nations people are moving to a more western diet which is high in protein,” he says.

“The obvious difficulty there is where is the land going to come from when there is already competing uses for it, particularly with the pressure of urbanisation? So the estimates suggest we have to produce at least 50% more food by 2050 and we've got to do that based on arable land resources not keeping pace with that growth.

“Clearly we're going to need technology and practices which we don't currently have to achieve this challenge of doing more with less. I'm an optimist as I think mankind has a history of inventing solutions for its problems when it needs to.

“So, I wouldn't say it's a major strategic point for us but certainly the way in which we can synthesise some of our ingredients in the

laboratory and then fortify food with them, without placing a strain on land, is a potential contribution to the search for solutions to our global food production issues. Our strategy is to focus on providing our customers with the quality, safe nutritional ingredients they require and we do this with a mixture of natural ingredients as well as those we synthesise. However, if the latter places a little less pressure on land as we do that, it's a fortuitous benefit.”

With the global population expanding and pressure on farmers to produce more with fewer resources, it is likely that the ingredients business can expect growing demand not only to help fortify the food an extra billion people will be eating by 2050 but also to ensure the feed used to rear livestock is also of adequate nutritional value too and just as efficiently used.

How a little goes a very long way

If there is one sentiment that can sum up the benefit which Rick Greubel believes ingredients can have on food and feed it is that a tiny amount can do a huge amount of good. The President of Human Nutrition and Health at DSM Nutritional Products points out that a small amount of an ingredient goes a long way in fortifying many servings of food, feed and drink, providing extra nutrition and health at very low cost.

This sentiment is certainly backed up by what UNICEF has found. When babies who are undernourished in vitamin A are given the vitamin, infant mortality rates drop by nearly a quarter (23%).

In fact, when the UN agency reported on the impact nutritional supplements can have in developing countries it came up with the figure that a global investment in a multi supplement programme of \$1.2bn over 5 years would deliver £15.3bn benefit, in the form of better health, lower death rates and improved earnings.

In more detail, a \$60m global programme in zinc and vitamin A supplementation would deliver \$17.9 worth of benefits for every \$1 invested. Similarly, every dollar invested in salt iodization (lack of iodine is identified as a major cause of mental development problems) would result in \$30 worth of return.