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RRes Press Release 4 Jun 19 Foods enhanced with proven health benefits not making it to consumers quickly enough

Tools for tackling global epidemics of malnutrition, obesity and their associated health problems are stuck in 'development limbo', says GM expert

Professor Johnathan Napier, who pioneered the development of plants that produce heart healthy omega-3 fish oils, says that misinformation and over-regulation is stopping or slowing several GM foods with the potential to save lives from making it to consumers.

He points to the example of Golden Rice, which has been genetically modified to provide more Vitamin A than other rice varieties and was first created by scientists nearly 20 years ago, with the initial concept developed at least 10 years before that.

Professor Napier said: "Vitamin A deficiency is a huge problem in the developing world, killing or blinding over a million children a year and effecting hundreds of millions of people in total. Yet, as of last year, no golden rice has ever been grown for human consumption.

"The technology is proven, the rigorous safety studies have been done, the nutritional research shows Golden Rice is an excellent source of vitamin A – but still it is not being produced, despite having been formally approved for feed or food use in USA, Canada and New Zealand and Australia.

"It's been stuck in development limbo for far too long now, and not available to the people who would benefit from it. If there was a pharmaceutical that could achieve a similar public health benefit but wasn't being made available, there would be a public outcry over it. And unlike many drugs, Golden Rice has been made not-for-profit by its creators."

Whilst many enhanced crops traits are aimed at tackling malnutrition in developing countries, others target the health impacts of obesity - such as heart disease, diabetes and strokes - that currently blight most developed countries.

[Writing in the journal Nature Plants](#), Professor Napier and colleagues argue, based on lessons learned by the whole sector over many years, that there are four main areas where issues may arise and impede the delivery of crops with nutritional enhancements to consumers: the economic value-chain, the patent system, the regulatory system and societal acceptance.

And whilst these areas per se don't all directly impact on speed of delivery, how each is dealt with will certainly affect progress, he says.

"We are keen to avoid these pitfalls and want to highlight them to others too, especially with the new wave of potential crops with nutritional enhancements."

These enhancements include tomatoes high in anthocyanins, Professor Napier's own omega-3 study system, and various cereals fortified with iron or extra vitamins, such as folic acid.

The authors say that in many cases, these barriers are stopping such improved crops even making it out of the lab.

"What we need is a different innovation pathway, one that isn't reliant on market forces and economics, to speed up this process," says Professor Napier. "When you consider much of the science behind these developments has been publicly funded to the tune of hundreds of millions of pounds, at the very least we owe it to the taxpayer to deliver the promised benefits."

Rather than rely on industry to invest in and develop these scientific breakthroughs, the authors suggest that this public funding is continued to help navigate the regulation process and produce an end-product for the consumer.

Professor Napier said: "One can easily imagine a model whereby the costs of this would be offset by the savings to national health services from having healthier populations. Not only that, the public essentially become stakeholders in the product, which might help allay much of the suspicion around the motives of multinationals that accompany many new products within both agriculture and medicine."

Co-author Dr Matina Tsalavouta, Head of Research and Impact Marketing and Communications at the University of Liverpool, said there is an opportunity to create an effective pathway to delivering solutions as fast as it is practically possible to those who need it most.

"The issues outlined in the paper also suggest that it is critical to work across disciplines and expertise, bringing together economists, public health researchers, intellectual property experts, social scientists and end users, to explore all the issues that may arise from the use of the remarkable technological advances in the life sciences. This approach has the potential to enable more effective development of solutions to pressing global health challenges," she added.

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