PROJECT SYNDICATE

A Golden Rice Opportunity

Bjørn Lomborg

Bjørn Lomborg, an adjunct professor at the Copenhagen Business School, founded and directs the Copenhagen Consensus Center, which seeks to study environmental problems and solutions using the best available analytical methods. He is the author of *The Skeptical Environmentalist* and *Cool It*, the basis of an eponymous documentary film.

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SÃO PAULO – Finally, after 12 years of delay caused by opponents of genetically modified (GM) foods, so-called "golden rice" with vitamin A will be grown in the Philippines. Over those 12 years, about eight million children worldwide died from vitamin A deficiency. Are anti-GM advocates not partly responsible?

Golden rice is the most prominent example in the global controversy over GM foods, which pits a technology with some risks but incredible potential against the resistance of feel-good campaigning. Three billion people depend on rice as their staple food, with 10% at risk for vitamin A deficiency, which, according to the World Health Organization, causes 250,000-500,000 children to go blind each year. Of these, half die within a year. A study from the British medical journal *The Lancet* estimates that, in total, vitamin A deficiency kills 668,000 children under the age of five each year.

Yet, despite the cost in human lives, anti-GM campaigners – from Greenpeace to Naomi Klein – have derided efforts to use golden rice to avoid vitamin A deficiency. In India, Vandana Shiva, an environmental activist and adviser to the government, called golden rice "a hoax" that is "creating hunger and malnutrition, not solving it."

*The New York Times Magazine*reported in 2001 that one would need to "eat 15 pounds of cooked golden rice a day" to get enough vitamin A. What was an exaggeration then is demonstrably wrong now. Two recent studies in the *American Journal of Clinical Nutrition* show that just 50 grams (roughly two ounces) of golden rice can provide 60% of the recommended daily intake of vitamin A. They show that golden rice is even better than spinach in providing vitamin A to children.

Opponents maintain that there are better ways to deal with vitamin A deficiency. In its latest statement, Greenpeace says that golden rice is "neither needed nor necessary," and calls instead for supplementation and fortification, which are described as "cost-effective."

To be sure, handing out vitamin pills or adding vitamin A to staple products can make a difference. But it is not a sustainable solution to vitamin A deficiency. And, while it is cost-effective, recent published estimates indicate that golden rice is much more so.

Supplementation programs costs $4,300 for every life they save in India, whereas fortification programs cost about $2,700 for each life saved. Both are great deals. But golden rice would cost just $100 for every life saved from vitamin A deficiency.

Similarly, it is argued that golden rice will not be adopted, because most Asians eschew brown rice. But brown rice is substantially different in taste and spoils easily in hot climates. Moreover, many Asian dishes are already colored yellow with saffron, annatto, achiote, and turmeric. The people, not Greenpeace, should decide whether they will adopt vitamin A-rich rice for themselves and their children.

Most ironic is the self-fulfilling critique that many activists now use. Greenpeace calls golden rice a "failure," because it "has been in development for almost 20 years and has still not made any impact on the prevalence of vitamin A deficiency." But, as Ingo Potrykus, the scientist who developed golden rice, has made clear, that failure is due almost entirely to relentless opposition to GM foods – often by rich, well-meaning Westerners far removed from the risks of actual vitamin A deficiency.

Regulation of goods and services for public health clearly is a good idea; but it must always be balanced against potential costs – in this case, the cost of not providing more vitamin A to eight million children over the past 12 years.

As an illustration, current regulations for GM foods, if applied to non-GM products, would bar the sale of potatoes and tomatoes, which can contain poisonous glycoalkaloids; celery, which contains carcinogenic psoralens; rhubarb and spinach (oxalic acid); and cassava, which feeds about half a billion people, but contains toxic cyanogenic alkaloids. Foodstuffs like soy, wheat, milk, eggs, mollusks, crustaceans, fish, sesame, nuts, peanuts, and kiwi would likewise be banned, because they can cause food allergies.

Here it is worth noting that there have been no documented human health effects from GM foods. But many campaigners have claimed other effects. A common story, still repeated by Shiva, is that GM corn with Bt toxin kills Monarch butterflies. Several peer-reviewed studies, however, have effectively established that "the impact of Bt corn pollen from current commercial hybrids on monarch butterfly populations is negligible."

Greenpeace and many others claim that GM foods merely enable big companies like Monsanto to wield near-monopoly power. But that puts the cart before the horse: The predominance of big companies partly reflects anti-GM activism, which has made the approval process so long and costly that only rich companies catering to first-world farmers can afford to see it through.

Finally, it is often claimed that GM crops simply mean costlier seeds and less money for farmers. But farmers have a choice. More than five million cotton farmers in India have flocked to GM cotton, because it yields higher net incomes. Yes, the seeds are more expensive, but the rise in production offsets the additional cost.

Of course, no technology is without flaws, so regulatory oversight is useful. But it is worth maintaining some perspective. In 2010, the European Commission, after considering 25 years of GM-organisms (GMOs) research, concluded that "there is, as of today, no scientific evidence associating GMOs with higher risks for the environment or for food and feed safety than conventional plants and organisms."

Now, finally, golden rice will come to the Philippines; after that, it is expected in Bangladesh and

Indonesia. But, for eight million kids, the wait was too long.

True to form, Greenpeace is already protesting that "the next 'golden rice' guinea pigs might be Filipino children." The 4.4 million Filipino kids with vitamin A deficiency might not mind so much.