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Genetically modified muddle

Do you grow your own food? Do you pack it yourself? Have you had it in your possession at all times? If the answer to any of these questions is no, then you have made significant assumptions about the food you eat and the level of food security risk that is acceptable to you.

Whether the countries of the European Union will ever find genetically modified (GM) crops and food as acceptable as the heavily processed groceries they already consume without question remains to be seen. But as of now, the United Kingdom and France appear to be on the verge of a three- to five-year moratorium on growing GM crops within their borders. Marks & Spencer, a major UK department store chain, has announced that it will pull all GM foods off its shelves. Other retailers will soon follow suit. The United Biscuit Holdings, the UK's largest cookie maker, has recently called for universal labeling of all GM food. Most significant, perhaps, is the announcement that Sainsbury Supermarkets, the second largest chain in the UK, will guarantee its customers that all of its Sainsbury-brand products are GM-free. David Sainsbury, who heads the company, is also minister of science in the UK government and a leading light in UK government efforts to educate the public about genetic manipulation and to reform legislation regulating biotechnology.

Some members of the European Union feel that the short- and long-term risks to human health and the environment have not been satisfactorily investigated. They are behaving as if no field trials of any GM crops have ever been conducted in any part of the world, and as if no human beings have ever consumed GM food products.

In fact, very recent reports from the UK House of Lords on European Commission Regulation of Genetic Modification in Agriculture and the UK Royal Society on Regulation of Biotechnology are admirably unequivocal in their science-based endorsements of the safety of GM foods. The former concludes that "Many products from GM plants. . . are absolutely identical to conventional products," while others "are so similar that they are regarded as 'substantially equivalent'". The latter stresses that "the emphasis should not be on 'genetically modified,' but on the new characteristics of any individual product."

In rejecting GM foods on the basis of biotechnology's early efforts, it needs to be pointed out that supermarkets and food processors are preventing their customers from access to foods that may in the future bring them health benefits. Products with improved nutritional content or reduced fat profiles are as relevant to better health in the countries of the North as they are to the countries of the South. In effect, the supermarkets are discouraging the development of such products while continuing to sell tobacco, alcohol, fatty foods and candies. Perhaps the international medical community should protest on behalf of individuals and the health of nations at what is already being sold on shop shelves. If health safety is what consumers are looking for when they shop, then they ought to be aware that food retailers are flying a shaky flag, nutritionally speaking.

There are rational arguments in favor of a moratorium on growing genetically manipulated crops in certain European countries. These are environmental: It is the case that, in Europe, crop-growing areas are cheek-by-jowl with leisure and conservation areas to a much greater extent than, say, in Canada or the United States. There seems to be evidence that agricultural intensification does have an adverse

effect on the viability of sustainable populations of small animals, insects, and plants that live around the fringes of agricultural land. There is a likelihood that agronomically useful traits such as herbicide tolerance and insect resistance could have an impact on such wildlife.

At the same time, it is certainly true that genetic modification is not the only mechanism of intensification. It is likely that other methods of increasing productivity would have as great, or greater, impact on the environment. We should take care in defining the set of existing circumstances as natural and desirable and the set of new circumstances as unnatural and undesirable. For all their validity, environmental arguments are being undermined by the willingness of their proponents to allow them to be conflated with wholly separate arguments about the desirability of genetically modified foodstuffs.

There also appears to be just as many foreseeable environmental benefits as imaginable risks accruing from GM crops in agriculture. A report in March from the US National Center for Food and Agricultural Policy on The Impact of Biotechnology on US Crop Protection cites evidence that GM crops enable significant reductions in pesticide usage and a shift to farming practices that reduce topsoil erosion, greenhouse gas emissions, and agricultural runoff.

What can be done in the face of continued obfuscation of the available facts with respect to GM foods and crops? Clearly, we must continue with the fundamental research that will, given the freedom and time, inevitably allow us to engineer truly meaningful agronomic characteristics like salt and drought tolerance. But perhaps we must also redo experiments that have already been undertaken in the United States in Europe to confirm that the results hold true on both sides of the Atlantic—and everywhere else. If such is the course we must follow, then we need also to devise and conduct experiments that assess in a straightforward and honest manner the range of possible risks (one such risk, the probability of transgene escape, even when engineered into maternally transmitted chloroplasts, is addressed in the paper by Scott and Wilkinson on p. 384). Importantly, we must also find out exactly what sorts of evidence would satisfy skeptics—what are the definitive proofs of GM safety with respect to toxicity, allergenicity, antibiotic resistance, wildlife, and biodiversity protection?

At a time when governments and companies continue to inspire more distrust than confidence when it comes to safeguarding the public good and the public food supply, a European moratorium may be inevitable. But the issue should be dealt with swiftly; there is no justification for long delays to accommodate extended research programs on the safety of GM foods. Perhaps nothing more than an objective exercise in collation and presentation of existing data is needed; the time scale for that is one of months rather than years.

Biotechnology companies can also continue to develop the next generation of products—products that will finally bring to consumers' attention qualities that they can appreciate directly. The controversial GM crops of the moment—soybeans and maize—are modified to have obvious commercial value to the companies that make the seed and sell the herbicides, and to the growers who use them, but no obvious value to consumers. GM soybeans? Who needs them? Bringing products to market that add value at the consumer end will, more than any instructional sermon or ad campaign, help people begin to appreciate why this new green revolution is so vital.