



Agricultural Issues Center
University of California
and
Department of Agricultural and
Resource Economics
University of California, Davis

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International Approaches to the Labeling of Genetically Modified Foods¹

Colin A. Carter and Guillaume P. Gruere²
Agricultural Issues Center, University of California
and
Department of Agricultural and Resource Economics
University of California, Davis

The United States accounts for two-thirds of bioengineered crops produced globally. Other major suppliers include Argentina, Canada, and China. More than 20 percent of the global crop areas of soybeans, corn, cotton, and canola acres are now biotech varieties (ISAAA, 2003). In addition, biotech ingredients and biotech processes are used in producing a wide selection of food and beverage products such as meat, poultry, cheese, milk, and beer.

The United States first exported genetically modified (GM) food to Europe in 1996. It was tomato puree from California and it was voluntarily labeled as genetically engineered. The product was a big hit with consumers in Britain because it was cheaper than conventional tomato puree. However, when GM soybeans were imported into Europe later that year, there was a huge backlash from environmental groups such as Greenpeace. The European Union (EU) was then quick to introduce mandatory labeling for GM foods, which took hold in 1997. The U.S. government viewed the European mandatory labeling policy as a trade barrier, and so began another U.S.-EU agricultural trade dispute that is still ongoing.

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² Colin A. Carter is Professor of Agricultural and Resource Economics, a member of the Giannini Foundation, University of California, Davis, and is Associate Director, International Trade, University of California Agricultural Issues Center. Guillaume P. Gruere is a Ph.D. candidate in Agricultural and Resource Economics, University of California, Davis. We thank Peter Barry for his comments and we acknowledge financial support from the University of California Agricultural Issues Center as a part of the Agricultural Marketing Resource Center project.

This transatlantic trade dispute has spread to many other countries. Governments around the world are developing GM labeling requirements, and they are finding themselves caught between the U.S. and the EU approaches. Consumers are confused about what exactly GM foods are and whether these foods are harmful or not. Scientists have determined that pre-commercialization assessment procedures of bioengineered food ensure the GM food is nutritionally equivalent and as safe as conventional food (e.g. the World Health Organization, 2000). However, in Europe consumers do not necessarily trust scientists, especially after they were told in the mid 1990s that humans could not get mad cow disease.

The GM labeling issue is not just about science. Rather, the politicians and environmental groups in Europe and elsewhere say GM labeling is about consumer choice and consumer rights, and is not even a health issue. The Europeans are clearly taking a precautionary approach. Alternatively, the United States, Canada and Japan are using science-based risk assessment procedures. The purpose of this article is to discuss international approaches to GM labeling and to shed some light on why the approaches vary so much across nations.

Labeling Issues

Any decision on labeling of GM food presents major challenges for policy makers. The most fundamental problem relates to DNA detection, because the measurement of GM material becomes difficult or impossible if the GM crop is highly processed. For example, products such as soybean oil or meat produced from GM feedstuffs do not contain any evident GM protein. In addition, biotechnology that is used in certain food and beverage manufacturing processes cannot easily be detected in the final product. Most cheese for example is made with genetically engineered enzymes.

Proponents of mandatory GM food labeling believe that consumers have the right to know whether or not they are eating GM foods. Opponents say that such a label implies a non-existent food safety risk. Trying to label something that's not detectable invites fraud and the fraud cannot even be detected. Mandatory labeling would result in unnecessary marketing costs due to segregation and identity preservation requirements, with no apparent offsetting consumer benefit. In addition, mandatory labeling requirements could inhibit further development of GM technology. Within the EU, there are concerns over a slowdown in biotech crop research and the long run international competitiveness of EU agriculture (Mitchener, 2002).

Even with mandatory labeling, standards are inconsistent and consumers are not necessarily provided with greater choice. In Japan and the EU (where GM labeling is mandatory) it is virtually impossible to find food products on the food shelf labeled as containing GM ingredients. So the approach taken by Japan and the EU is not really giving consumers a choice. Furthermore, a substantial amount of GM food eaten in the EU and Japan doesn't have to be labeled. These products include cheese, soya sauce, vegetable oils, baked goods and numerous manufactured foods.

The strict European regulations are also serving to delay the introduction of GM crops in poor countries, such as the vitamin A enriched rice (the so-called golden rice). Cotton remains the only GM crop planted in South Africa or India, because GM cotton does not have labeling requirements anywhere. Zambia's refusal of GM corn as food aid in the face of massive starvation caught the world's attention and resulted in criticism of the EU.

International Approaches to GM Labeling

Internationally, the Codex Alimentarius Commission (www.codexalimentarius.net), an international standards setting body for food, has a Committee on Food Labeling. Since 1990, Codex has sought to develop guidelines for labeling biotech foods. So far, however, there is no agreement on the international standards. In all likelihood, a final Codex standard on the labeling of biotech foods will not occur for many years.

The approaches taken in different countries towards GM food labeling differ greatly (Sheldon, 2002) as shown on Table 1. The EU has very strict GM labeling guidelines. In contrast are the United States, Argentina, and Canada, the three big producers, whose governments do not believe in mandatory labeling. Japan, South Korea, China, and other countries are in-between the EU and the United States on this issue.

Table 1. Sample of International Guidelines for Labeling GM Foods

	Labeling Scheme	% Threshold for Unintended GM Material	Are Some Biotech Foods and Processes Exempt?
Canada	Voluntary	5% ^c	N/A
United States	Voluntary	N/A	N/A
Argentina	Voluntary	N/A	N/A
Australia & New Zealand	Mandatory	1%	Yes
European Union	Mandatory	0.9% ^a	Yes
Japan	Mandatory	5% ^b	Yes
S. Korea	Mandatory	3% ^b	Yes
Indonesia	Mandatory	5% ^c	Yes

N/A means not applicable

- a. Proposed threshold in the EU, lowered from 1%.
- b. Top 3 ingredients in Japan and top 5 ingredients in S. Korea.
- c. Not yet operational.

Source: Personal interviews and various Attaché Reports from the USDA Foreign Agricultural Service (<http://www.fas.usda.gov/itp/biotech/countries.html>).

The U.S. government's non-support for mandatory labeling reflects the scientific evidence by the FDA that GM foods are nutritionally equivalent to non-GM foods. As long as the food is safe from impurities, labeling is not needed.

This is not to say that a labeling debate does not exist in the United States. Anti-biotech groups in Oregon put the GM labeling issue on the state's 2002 ballot—Measure 27. If it had passed, Measure 27 would have required the labeling of any product containing GM ingredients, or processed with GM material or biotechnology. The anti-biotech groups plan a similar initiative for California in 2004.

In 2002, the EU's Parliament approved new GM labeling proposals. If implemented, they could jeopardize a large share of U.S. food exports to Europe. These new guidelines were debated and modified in the EU Commission and in the EU Council at the end of 2002. The European Parliament is expected to deliberate over the proposal in the first half of 2003, with final adoption by year-end.

The proposed EU regulations would require the labeling of foods whose ingredients contain 0.9% or more of GM DNA or protein. The current tolerance level is 1%. The new EU regulations would require labeling of food and feed products containing even non-detectable GM material. Importantly, only authorized GM material would be allowed in food and feed sold in the EU. Compared to the U.S. or Japan, only a small number of GM crops are authorized in the EU.

Partly in response to these new EU labeling proposals, the U.S. government is threatening to file a World Trade Organization (WTO) trade action against the EU for restraining trade. The trade action would cover the EU moratorium on any new GM crops in Europe, in place since 1998, and the European labeling regulations. The costs of the labeling regulations in the EU are largely borne by U.S. exporters. The 0.9% tolerance level will be costly to implement for food processors. It seems excessively low for a label with no intended food safety purposes. Besides, the absence of labeled GM products at the retail level makes this labeling policy a "political" moratorium.

Australia and New Zealand jointly adopted mandatory labeling with a 1% threshold for the unintended presence of GM product, but vegetable oils, food additives, and food processing aids, such as enzymes used in cheese and brewing, are exempt from labeling requirements.

Japan's labeling regulations are much more reasonable than those in the EU. The Japanese government requires mandatory labeling when GM material is present in the top three raw ingredients and accounts for 5% or more of the total weight. It also admits the presence of non-GM labels at the same tolerance level, if produced with identity preservation. So tofu can be made from non-GM soybeans and be labeled as such or else it must be labeled as containing GM material. Exemptions to Japan's labeling requirements include feedstuffs, alcoholic beverages, and processed foods such as soya sauce, corn flakes, and other vegetable oils. South Korea's regulations are similar to Japan's except the tolerance level is 3% of the top 5 ingredients. In the EU, the threshold applies to each ingredient.

China leads the world in public biotech crop research (Huang, Rozelle, Pray, and Wang, 2002). GM crops in the field trial stage include rice, wheat, corn, soybeans, potatoes,

cabbage, and tobacco. GM cotton accounts for about 30% of China's cotton acreage. China has not yet announced a firm position on GM labeling, but it has recently proposed restrictions on GM crop imports. Outside China, this is viewed as a trade barrier that limits soybean imports from the United States. China's position towards biotechnology in agriculture appears to be heavily influenced by EU policy.

After 14 years of testing GM crops in experimental fields, the Mexican government has drafted legislation authorizing the planting of GM crops, from March 2003. In February 2001, the Mexican Senate approved a draft regulation requiring the labeling of GM food and feed, but the Mexican Chamber of Deputies, under pressure from the U.S., did not ratify this proposition.

Why these differences?

So why do we observe the wide difference in approaches to GM labeling across countries? There are several possible explanations. The EU and Japan have experienced domestic food scares in recent years. Consumers in these countries do not believe scientists and politicians who say GM food is safe. Political pressure from environmental groups plays on this fear and raises unscientific concerns about GM food safety (Bernauer and Meins, 2001).

Environmental and consumer groups support mandatory labels for the sake of consumer choice. But mandatory labels (such as "this product contains GM ingredients") are still perceived by consumers as warning signals. In this situation, processors prefer to avoid labeling, and thus do not exceed the threshold level. For some pressure groups, labeling appears as a first step towards an outright ban of GM products.

On a larger scale, labeling affects international trade. Consequently, the European policy affects the choices of other agricultural exporting countries. Australian GM policies were partially designed to fit the labeling requirement for exports to the EU or Japan. Eastern European countries and Russia have probably decided to follow the EU 1% threshold-labeling requirement for trade reasons. Those eastern European countries planning to join the EU really have no choice.

The labeling of GM food may be soon disputed at the WTO. The United States has waited to launch a WTO dispute against the EU, because they feared it could drive a deeper wedge between EU and U.S. GM policy. The U.S. administration recently decided to further delay the WTO action to seek EU support for the Iraq war. U.S. lawyers are confident they would win the dispute (Washington Post, 2003). To reduce the negative effect of an international dispute, the US needs allies in developing countries. A dispute could actually help to generate a stable agreement on GM labels. According to international observers, a WTO jurisprudence on GM labeling regulations could be the only way to achieve an agreement on labeling based on Process and Production Methods (PPM) standards.

References

Bernauer, T. and E. Meins. 2001. 'Scientific Revolution Meets Policy and the Market: Explaining Cross-National Differences in Agricultural Biotechnology Regulation.' CIES Discussion Paper 0144, November, University of Adelaide.

Huang J., Rozelle S., Pray C. and Q. Wang. 2002. 'Plant Biotechnology in China.' Science Jan 25, 2002 v295 i5555 p674(4).

International Service for the Acquisition of Agri-biotech Applications (ISAAA). 2003. '2002 Global GM Crop Area Continues to Grow for the Sixth Consecutive Year at a Sustained Rate of More than 10%'. Available on the Internet site www.isaaa.org.

Mitchener, B. 2002. 'Europe has no appetite for modified food'. Wall Street Journal, September 23, 2002, Section B, page 3, Column 1.

Sheldon, I. 2002. 'Regulation of Biotechnology: Will we ever 'freely' trade GMOs?' European Review of Agricultural Economics, 29(1): 155-176.

The Washington Post. 2003. 'US hints it will sue EU over altered crops. Complaint about food ban would go to WTO' January 9, 2003.

World Health Organization. 2002. 'Safety Aspects of Genetically Modified Foods of Plant Origin' Report of a Joint FAO/WHO Expert Consultation on Foods Derived from Biotechnology, WHO, Geneva.