

EM 8817  
October 2002

# Economic Issues and Oregon Ballot Measure 27: Labeling of Genetically Modified Foods

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The debate surrounding Measure 27, to require labeling of genetically modified (GM) foods sold or distributed in or from Oregon, encompasses many aspects of an important and complex topic. At one level, questions are raised about the benefits and potential risks of GM foods. Proponents of genetic modification in agriculture contend that it is a safe, valuable tool for efficiently producing more food. Critics point out that the safety of GM foods to human health and the environment is unproven.

These issues have in turn led to questions about consumers' right to know what is in their food and how best to make this information available to them. Recent national polls indicate that a majority of U.S. consumers believe that government should require labels on genetically modified foods.

For Oregonians, Measure 27 raises a number of additional questions, including: Should Oregon be the first state to require labeling of GM foods? Is now the right time? Is Measure 27 the best way to go about it?

Although there are many questions related to the benefits and costs of Measure 27 to the economy, environment, and consumers, this publication addresses

only the following economic questions:

- How much will Measure 27 cost food consumers?
- What will be the fiscal (government) costs of implementing Measure 27?
- How do the costs and benefits of Measure 27 compare to alternative approaches to GM labeling?
- What other effects might this measure have on food producers, consumers, distributors, and processors within and outside of Oregon?

## Costs of GM labeling to consumers and government

Some type of GM labeling is required in various forms in 22 countries and the European Union.<sup>1</sup> However, there are no "after-the-fact" analyses of how these laws have affected costs to producers or consumers.

The best available estimates come from several economic studies that have estimated the costs of GM labeling in specific countries. The economies and labeling requirements considered differ somewhat from those proposed for Oregon. Nevertheless, these studies provide a starting point for thinking about the potential economic effects of Measure 27.<sup>2</sup>

The most detailed estimates come from the consulting firm National Economic Research Associates (NERA) for the government of the United Kingdom.<sup>3</sup> They

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<sup>1</sup>The United Kingdom, France, Ireland, Austria, Switzerland, the Czech Republic, Spain, Hungary, Netherlands, Poland, Slovenia, Australia, New Zealand, China, Hong Kong, Indonesia, Japan, South Korea, Taiwan, Thailand, Brazil, and Mexico (Phillips and McNeill 2000).

<sup>2</sup>A report titled "Economic and implementation analysis of Oregon Measure 27" was produced by Northbridge Environmental Management Consultants for Coalition Against the Costly Labeling Law in August 2002. This report, however, does not represent a detailed, thorough, or reliable economic analysis: it does not include an adequate justification for its assumptions and aggregations, a detailed description of its methodology, or complete references. For example, it relies heavily on farm-level compliance costs for the four main GM crops (corn for grain, soybeans, cotton, and canola), which represent less than 0.25 percent of Oregon farm sales. The report makes claims about the costs of Measure 27 that are many times higher than those discussed in this publication.

<sup>3</sup>Details on the methodology and assumptions in the study are contained in the report to the UK Food Standards Agency (<http://www.foodstandards.gov.uk/multimedia/pdfs/gmlabelleg>).



considered the effects of five labeling alternatives on the economy and on government over a 20-year period. They examined costs of food production and distribution as well as public-sector costs for monitoring and enforcement. The five options are as follows:

- Option A requires labeling if GM DNA or protein is present in the final product (as currently required in the United Kingdom).
- Option B introduces a voluntary “GM-free” label, which indicates that gene technology has not been used anywhere in the production of a food product. This voluntary scheme would be in addition to the mandatory labeling under Option A.
- Option C requires mandatory labeling of all foods containing or derived from GM materials, including ingredients, additives, and flavors, regardless of whether traces of modified DNA or protein could be detected.
- Option C+ combines Option C with the voluntary “GM-free” scheme described under Option B.
- Option D is the most inclusive. It requires labeling of foods that use GM processing aids (e.g., rennin used in cheese-making), as well as meat, milk, and eggs derived from animals fed on GM feeds. The threshold level for Option D is unclear, but presumably would be zero for nonaccidental inclusions of GM materials. This option is the most similar to Measure 27.

The estimated cost of each option is shown in Table 1. Private-sector compliance costs (to producers and consumers) are estimated separately from government enforcement costs. The main costs involve segregation (keeping GM

and non-GM foods separate through the time of final sale), identity preservation (tracking the identity of foods from their point of production through sale to consumers), and enforcement (inspections and laboratory testing).

There are three other studies of the costs of proposed mandatory labeling schemes. Two were conducted jointly for the governments of Australia and New Zealand (KPMG 2000). A separate study considered the potential costs of mandatory labeling in Canada (KPMG Consulting 2000). These estimates also are reported in Table 1. Option D of the NERA study and all three of the KPMG studies are similar to Oregon’s Measure 27.

On a per-person, per-year basis, three of the four estimates are similar, ranging from \$2.65 for New Zealand, to \$3.89 for Option D in the UK, to \$9.75 for Australia. These annual per-person estimates include government costs that, for Oregon, would

total between \$100,000 and \$1.25 million.

The fourth estimate (Canada) indicates significantly higher costs (\$35 to \$48 per person per year). However, this study was based on more limited information and a less detailed analysis of costs than the others.<sup>4</sup>

<sup>4</sup>The NERA report notes that the KPMG Canada study had high estimates of added costs in manufacturing and processing (nearly twice as high as the NERA estimates per metric ton) based only on interviews with industry experts. It also included a \$2/mt cost for redesign of labeling. In addition, rather than looking at the number and amount of crops that would require segregation, it assumed that 70 to 85 percent of processed foods would be subject to labeling and would incur the same costs as those calculated for individual crops. NERA, on the other hand, assumed that a smaller percentage of processed foods would need labeling since many supply chains may be restricted to GM or non-GM ingredients only (NERA 2001).

**Table 1. Cost estimates for GM food labeling**

	Society			Per person*	
	Compliance cost (\$ million)	Government cost (\$ million)	Total (\$ million)	(\$)	Percent of food spending
<b>UK</b>					
Option A	13.5	0.23	13.75	0.23	0.01
Option B	37.5	0.30	37.80	0.64	0.03
Option C	105.0	0.40	105.40	1.77	0.08
Option C+	119.0	0.47	119.50	2.01	0.09
Option D	231.0	0.55	231.55	3.89	0.17
<b>Australia</b>	165.0	0.35–8.0	165–173	9.75	0.75
<b>New Zealand</b>	18.0	0.21	18.21	2.65	0.20
<b>Canada</b>	—	—	—	35–48	1.3–1.8

The NERA study estimates start-up and continuing costs over a 20-year period. It then converts these costs into their present value equivalent using a 6 percent discount rate. Estimates are shown here as annualized average costs over the 20-year period (also using a 6 percent interest rate). The annualized estimates are reported in U.S. dollars, assuming \$1= 1 euro..

\*Total of compliance cost and government cost

It is not surprising that cost estimates vary significantly. Costs depend on the size and composition of the economy, as well as on the details of the labeling rules. Any estimate of this kind should be taken as suggestive rather than precise.

The costs of GM labeling differ, for example, depending on the prevalence of GM products in consumers' food purchases. The higher the percentage of GM foods, the higher the cost. If consumers or producers move away from GM toward non-GM alternatives, the overall cost of labeling to the average consumer could be reduced.

Sixty to 70 percent of foods sold in the U.S. are said to contain some GM DNA, and similar percentages are reported for Australia and Canada. The NERA study assumed prevalence levels in the UK for the main GM crops to be about one-third lower than U.S. levels. Thus, on the basis of market prevalence, the cost estimates reported here should be broadly comparable.

By contrast, the cost of identity preservation and segregation depends crucially on the tolerance level specified in the regulations (the amount of accidentally introduced GM DNA permitted). According to NERA, for example, retail prices for meat would be virtually unaffected at a 5 percent tolerance level. At the 1 percent tolerance level, prices would increase by 1 to 2 percent. At the 0.1 percent level (the level mandated under Measure 27), prices would increase 7 to 8 percent. Thus, for a 0.1 percent tolerance level, there would be a relatively high percentage increase in cost.

Identity preservation (IP) and segregation costs vary by commodity. Therefore, the overall cost depends partly on the proportion of

commodities with high IP and segregation costs in the food economy. For example, IP costs for soybean are estimated to be 50 percent higher than for corn (NERA). If no GM version of a particular crop is grown, then IP is cheap and segregation unnecessary.

Few GM crops are grown in Oregon, reducing the costs incurred by Oregon farmers to comply with Measure 27. The major GM crops—corn, soybeans, cotton, and canola—account for less than 0.25 percent of Oregon farm sales (2001). Livestock fed with GM-based supplements, however, would be affected.

Not all costs associated with segregation and IP result from local mandatory labeling laws. Producers will incur some costs anyway if they export to countries with mandatory labeling. Indeed, some U.S. producers are already establishing IP and segregation procedures and facilities in response to labeling laws in Europe, Japan, Australia, China, and Brazil. Furthermore, as Europe moves toward EU-grown crops, which are largely non-GM, American exporters are expected to further segregate crops, especially corn and soybeans (NERA 2001; Ballenger et al. 2000)

### **Costs of Measure 27 compared to alternatives**

Some aspects of Measure 27 are likely to make it more costly to consumers than possible alternatives. For example, it has a very low tolerance level (0.1 percent) and requires labeling of all foods for which GM technologies were used in production, regardless of whether GM DNA is present in the final product.

The NERA study demonstrates how differences in these requirements affect costs. Going from Option A (labeling required only on

foods containing GM DNA) to Option D (labeling required on any food involving GM processing or GM animal feeds) results in an estimated 17-fold increase in costs. Options B and C+ (mandatory labeling of foods containing GM DNA plus voluntary labeling of foods for which GM technology was not used anywhere in production) are significantly less costly than Option D (see Table 1). Note that Measure 27 most closely resembles Option D.

### **Potential benefits of Measure 27**

The benefits of labeling to consumers depend on the information provided and the ability of consumers to interpret the information. As noted above, national polls indicate that a large majority believes government should require labeling on GM foods. Measure 27 would further that objective to some extent with labels that contain the words "genetically engineered." The inclusion of more specific information on labels may be possible at the discretion of the Oregon legislature.

Some ambiguities exist in Measure 27 that may reduce its benefits to consumers. For example, there is confusion about the definition of "genetically engineered" as it pertains to some wheat varieties that have been used for decades. These varieties were developed through interspecies "gene transfers" (e.g., from rye and wheat), chromosome doubling, and deleting or changing positions of genes (James Peterson, professor of wheat breeding and genetics, Oregon State University, personal communication, October 2002). These wheat varieties do not represent application of recombinant DNA techniques, but do fall under parts of the definitions found in Measure 27.

This confusion may reduce the compatibility between Oregon labeling requirements and those in other countries, and it could diminish the usefulness of labeling to consumers. If passed, however, it is up to the Oregon legislature and the Oregon Department of Agriculture to write the administrative rules for implementing Measure 27, and the legislature is authorized “to make changes that are consistent with the measure’s intent.”

### **Other potential costs of Measure 27**

Measure 27 differs from labeling requirements in other countries in several additional ways. It would require labeling of all foods sold “or distributed in or from Oregon.” This wording requires labeling on foods produced or processed in Oregon that are destined for markets where labeling is not required. It is unclear, however, whether shipments through Oregon would be affected, for example from the Midwest through the Port of Portland to Asia.<sup>5</sup>

### **Competitiveness of Oregon products**

Some producers are concerned that labeling requirements would weaken the competitiveness of

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<sup>5</sup>Opponents of Measure 27 state that it would require labeling in food services (restaurants, schools, hospitals), whereas the sponsors of Measure 27 have stated that food service is not included in the intent of the Measure. There is no explicit wording excluding food service; however, the Measure refers only to requiring labels on “the principal display panel” of the “outside container or wrapper.” The very high government cost estimates reported by opponents of Measure 27 are due largely to the inclusion of food service.

Oregon products in markets where they are the only products labeled as “genetically engineered.” Some consumers may choose similar, or even identical, products from states where labeling is not required, not realizing that those products also contain GM material.

This issue is more relevant to Oregon food processors than to farmers since GM crops account for such a small fraction of the state’s agricultural sales. This aspect of Measure 27 may have a significant impact on processed foods such as apples, cherries, pears, or other fruits packed in high-fructose corn syrup from GM corn.

On the other hand, GM labeling could give some Oregon producers a competitive advantage in countries that require GM labeling. It is impossible to estimate the extent of this effect. However, since Measure 27’s labeling standards differ from those in Europe, Japan, and elsewhere (in terms of tolerance levels, GM content, etc.), the labeling under Measure 27 also might create confusion.

### **Product availability in Oregon**

How would national food brands and out-of-state distributors respond to passage of Measure 27? Would they develop separate labels for Oregon, home to only 1.5 percent of the nation’s population? Or might some companies stop selling in Oregon?

It seems unlikely that, in general, food distributors would abandon Oregon. Companies fight intensively for small gains in overall market share, and they most likely would simply pass on the cost of labeling to Oregon consumers. Nevertheless, it is unclear what would happen during a transition

period as distributors jockeyed for position. The extent of disruption certainly would be greater for the first state to introduce mandatory GM labeling.

### **Effect on Oregon’s transportation industry**

If Measure 27 is interpreted to include labeling for shipments through Oregon, some shippers might avoid Oregon ports. However, wheat and barley (non-GM) are the main grains exported from the Port of Portland, whereas soybeans and corn are exported only on a “sporadic basis” ([www.portofportland.com/marcargo.htm](http://www.portofportland.com/marcargo.htm)). Again, if these products are destined for countries that require labeling, it is not clear whether there would be an additional cost under Measure 27.

### **Compatibility with international trade agreements**

Another potential issue is the compatibility of Measure 27 with international trade agreements. Concerns that Measure 27 would conflict with the rules of the World Trade Organization do not seem justified. Mandatory GM labeling is unlikely to be challenged successfully under the WTO, so long as it is applied equally to domestic and foreign products (Caswell 2000).

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## Summary

- The evidence suggests that mandatory GM labeling need not be highly costly to consumers and government. Several economic analyses for other countries estimate total annual costs ranging from 23 cents per person to about \$10 per person. Measure 27 is similar to other strict proposals with estimated annual costs of \$3 to \$10 per person. One study generated much higher cost estimates—\$35 to \$48 per person per year.
- Annual fiscal (government) costs are estimated to be between 3 cents and 37 cents per person. For Oregon's population, the total annual government cost would be \$100,000 to \$1.25 million.
- Given the specific requirements of Measure 27, the costs may be many times higher than for other labeling options. The reasons are the stringent 0.1 percent threshold on contamination and the inclusion of all foods for which genetic engineering was used in production or processing.
- Measure 27 may generate additional costs for producers and distributors due to the requirement for labeling of foods not destined for Oregon markets. This effect would depend largely on whether consumers in other markets avoid Oregon's GM-labeled products.
- Measure 27's cost may be lower than the above estimates to the extent that product segregation, identity preservation, and labeling are already becoming routine for exporters to foreign markets where GM labeling is required.

## Acknowledgments

This paper benefited from the comments of Bill Boggess, Steve Buccola, Julie Caswell, Terri Lomax, Pat McCormick, Jeff Peckman, David Philbrick, and Carolyn Raab, and from editing by Teresa Welch.

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Published October 2002.