Labeling of Genetically Modified Foods

http://extension.colostate.edu/topic-areas/nutrition-food-safety-health/labeling-of-genetically-modified-foods-9-371/

(Gives background and presents arguments for both sides)

by P. Byrne, D. Pendell, & G. Graff*

Quick Facts...

- Mandatory labeling of genetically modified (GM) foods has been proposed under a variety of initiatives at national and state levels but has not yet been implemented in the United States.
- Current U.S. law mandates food labeling when there is a substantial difference in the nutritional or safety characteristics of a new food. The U.S. Food and Drug Administration (FDA) does not consider the method of genetic engineering by itself to create such a difference.
- Companies may voluntarily label foods produced without genetic modification, and foods labeled USDA Organic are produced without genetic modification.

Whether or not to require labeling of food produced from crops that are genetically modified (GM) using recombinant DNA technology is a key issue in the ongoing debate over the risks and benefits of using biotechnology in agriculture. The U.S. government regulates GM food technologies, but once GM crops are approved they are considered to be 'substantially equivalent' to their conventional counterparts in terms of safety. Therefore, there is no federal requirement for labeling food that contains GM ingredients. Bills and ballot initiatives requiring mandatory labeling have been introduced and voted on in several states. The first states to have approved some form of mandatory labeling are Connecticut, Maine, and Vermont. Under U.S. law, companies may voluntarily label food products to inform consumers as to whether they do or do not contain ingredients from GM crops.

Genetically modified crops have been produced commercially and consumed in the U.S. since the mid-1990s. Today, the most common GM crops on the market are soybean, corn, cotton, canola, and sugar beet. (See CSU Extension Fact Sheet no. 0.710: Genetically Modified (GM) Crops: Techniques and Applications for more details.) Because many processed food products contain ingredients from one of these crops (e.g., soy protein or high fructose corn syrup), it is likely that a majority of processed foods in grocery stores include at least one GM crop ingredient (Lesser, 2013).

Current Labeling Policy

Since 1992, the U.S. Food and Drug Administration (FDA) has required labeling of GM foods only if the food has a nutritional or food safety property that is significantly different from what consumers would expect of that food. For example, if a new GM food includes a protein that may be an allergen not

expected to be present (such as a peanut protein expressed in a soybean), then it would have to be labeled. Otherwise, the FDA has not considered the methods used to produce new plant varieties (such as hybridization or genetic engineering) to present systematic differences in nutritional properties or safety concerns compared to standard methods of traditional plant breeding. Therefore, the method of development is not considered material information required to be disclosed in the labeling of foods under U.S. food safety laws (FDA, 1992). Early in 2001, the FDA proposed voluntary guidelines for companies that choose to label foods as to whether they do or do not contain GM ingredients if they see sufficient market opportunities for doing so (See FDA, 2001).

Voluntary vs. Mandatory Labeling

There are important differences between voluntary labeling and mandatory labeling.

A number of companies and initiatives already voluntarily provide labeling of food products regarding their avoidance of GM ingredients. Voluntary labeling does not require further regulatory measures. The costs associated with verification that the food product does or does not use GM ingredients are only incurred by those consumers who choose to purchase the labeled product.

Mandatory labeling would extend much further and would require, at a minimum, that all food products containing any GM ingredient (above a certain threshold for trace amounts) to indicate that fact. Stronger mandatory labeling requirements could include identification of each specific GM ingredient and its level of content in the product. Mandatory labeling requires further regulatory interventions including monitoring and enforcement. Under a mandatory labeling system, all consumers—both those that are concerned about the GM ingredients and those that are not—help bear the costs associated with being able to verify that foods do or do not use GM ingredients.

The USDA Organic Label Means That a Product Is Not Genetically Modified

USDA organic standards exclude the use of genetic engineering, but do not rule out the use of more conventional breeding methods, such as hybridization or tissue culture. Organic certification depends upon reasonable precautions being undertaken to prevent commingling and contact with GM products. Therefore, products labeled as 'USDA Organic' are effectively labeled as not containing GM ingredients.

Pros and Cons of Mandatory Labeling

There are many arguments both for and against the mandatory labeling of GM foods. These arguments are summarized below.

Arguments Made in Support of Mandatory Labeling (Benefits)

Consumers have a right to know what is in their food, especially concerning ingredients for which there may be health and environmental concerns (Raab and Grobe, 2003; NRC 2010).

Mandatory labeling will allow consumers to identify and steer clear of types of food products that they wish to avoid.

For religious or ethical reasons, some Americans may want to avoid eating certain products that may be introduced by GM methods.

Voluntary labeling has not been sufficient for informing consumers about the presence of GM ingredients.

Surveys indicate that a majority of Americans support mandatory labeling.

At least 64 countries have established some form of mandatory labeling (CAST, 2014).

Arguments Made Against Mandatory Labeling (Drawbacks)

Labels on GM foods imply a warning about health effects, whereas no verifiable differences in health effects between GM and conventional foods have been detected (Domingo and Bordonaba, 2011; Nicolia et al., 2013).

If a nutritional difference or allergenic characteristic were found in a GM food, current FDA regulations already require a label to that effect.

Costs associated with labeling of GM foods would be borne broadly by most consumers in order to fulfill the desires of some consumers.

Consumers who want to buy non-GM food already have options: to purchase verified non-GM foods or certified organic foods.

Experience with mandatory labeling in the European Union, Japan, and New Zealand has not resulted in greater consumer choice. Rather, retailers have eliminated GM products from their shelves due to perceived consumer aversion to GM products (Carter and Gruere, 2003)

The food system infrastructure (storage, processing, and transportation facilities) in this country could not currently accommodate the need for segregation of GM and non-GM products.

(AGAINST) Issues to Consider with Mandatory Labeling

Although mandatory labeling of GM ingredients may appear to be a straightforward measure, there are several complex issues that need resolving prior to implementation.

What percentage of a GM ingredient must be present in a food before a label is required?

For practical reasons, it is necessary to specify the threshold level of GM content allowed before the product must be labeled as GM. A commonly proposed threshold level is one percent. This is the labeling threshold decided upon by Australia and New Zealand. The European Union has decided on a level of 0.9 percent, while Japan has specified a five percent threshold. The lower the threshold, generally, the higher the cost of compliance and the broader the impact on the current food system.

Would meat, eggs, and dairy products from animals fed GM feed crops require a label?

Some labeling proposals include these products among those that would require labels. However, the biological rationale for doing so has not been demonstrated, that is, DNA or protein from inserted genes have not been found in livestock products. Neither the 2013 California state ballot initiative, the 2013 Washington state proposition, nor the 2014 Colorado state proposition has attempted to include meat and dairy products from animals fed GM feed grains.

Would food ingredients made using GM yeast or GM enzymes require a label?

Rennet, used in making cheese, and a number of other food ingredients such as some DHA (omega-3) supplements, vitamins, and lactase enzyme (added to milk for those who are lactose intolerant) are manufactured using GM algae or other GM microbes. The underlying genetic techniques used to make these are similar to those used to make GM crops. However, in the 2014 Colorado labeling proposition, for example, such foods are exempted from the labeling requirement.

Would food served in restaurants or other food-service establishments require a label?

In most labeling proposals that have been advanced or approved, foods sold via food service and restaurants are excluded.

How should regulators verify claims that a food is or is not genetically modified?

There are two ways that verification can be done: content based and process based verification.

Content-based verification requires testing foods for the physical presence of foreign DNA or protein. A current application of this type of procedure is the analysis and labeling of vitamin content of foods.

Process-based verification entails detailed record-keeping of seed source, field location, harvest, transport, and storage. This is similar to the type of 'identity preservation' system used to certify shade-grown coffee or organic foods.

What if just one state or a few states required labeling?

Practical issues would arise if just one or a few states required labeling while most others did not. Many food manufacturers produce for the larger regional, national, or even North American market. If requirements varied in one or a few states, that would mean manufacturers would have to produce a uniquely labeled (and possible uniquely formulated) product for sale in those states. Or they would simply label their entire product run, for all states, in compliance with strictest state's requirement. Under such conditions, one outcome might be that the Federal government would intervene, for example, on grounds that differences in state-by-state labeling requirements affect interstate commerce (see CAST, 2014).

What is the economic impact of mandatory labeling?

The cost of labeling involves more than the paper and ink to print an actual label. Costs arise from establishing and maintaining a system to track ingredients, from monitoring and enforcement or compliance with the law, from trade impacts, and from other factors. However, the impacts on producers, retailers, and consumers are likely to be varied, resulting in a net benefit to some while imposing a net cost on others.

Impacts along the value chain: Full and accurate labeling of specific ingredients may require an extensive identity preservation (IP) system from farmer, to elevator, to grain processor, to food manufacturer, to retailer (Maltsbarger and Kalaitzandonakes, 2000; Auer, 2003). Either testing or detailed record-keeping needs to be done at steps all along the value chain, or it would not be possible to know what specific ingredients are contained in a final food product. Other options could be less costly, such as using more general labeling language that does not require an extensive IP system.

In addition to these direct costs, there are also indirect costs. Food manufacturers and retailers may choose to avoid foods containing GM ingredients, requiring new formulations and sourcing arrangements. With a significant shift in demand away from GM crops, farmers would have to shift to potentially higher cost production and pest control methods.

Public costs for monitoring and enforcement: Costs would be borne by taxpayers to pay for agricultural and food authorities to monitor and enforce compliance with labeling requirements. These could vary significantly depending upon the terms and conditions of the requirements that are imposed.

Trade impacts: Another form of impact would be on trade in agricultural products. Imported products would have to comply with labeling requirements. This might effectively prevent some products from being imported and sold if the supplier of the product is unable to verify the origin of all of their contents. On the other hand, producers with verifiable labeled non-GM food products might find new export options to those countries that have comparable requirements.

Impacts on consumers: It is almost certain that food prices would increase to some extent as costs increase due to a labeling requirement. Estimates of the costs of mandatory labeling vary from a few dollars per person per year up to $400 per year or 10 percent of a consumer's food bill (Gruere and Rao, 2007; Alston and Sumner, 2012; Lesser, 2014). These higher prices would be borne by all consumers, but especially by lower-income consumers, who devote a higher share of household income to food purchases.