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Mandatory Labeling of Genetically Modified Foods: Does it Really Provide Consumer Choice?

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The mandatory labeling of genetically modified (GM) food aims to provide consumer choice. However, in the European Union and elsewhere, GM food with mandatory labeling has disappeared from the retail shelves. Food processors' economic incentives may explain why mandatory labeling has so far failed to provide consumer choice.

Key words: biotechnology, consumer choice, food labeling, food regulation.

Introduction

More than fifteen countries have implemented labeling requirements for genetically modified (GM) foods, including unlikely candidates such as Russia. This trend will soon include many other countries. The first GM labeling requirements for food products were introduced by the European Union (EU) in 1997 (Regulation EC No 258/97) as an application of the precautionary principle. The EU recently revised its rules on GM labeling to include feed and most food products derived from GM crops (even if there are no detectable GM genes in the final product) and lowered the threshold level for adventitious presence of GM material. The EU officially recognizes that approved GM foods are as safe as conventional foods, and mandatory labeling is justified solely by the desire to provide informed consumer choice: "We are allowing GM food onto the market but on our terms so people can make a full and informed choice" (EU Health and Consumer Protection Commissioner David Byrne, quoted in "GM laws to pave way for lifting of EU approvals ban," 2003).

In this paper we offer an explanation as to why mandatory labeling has not served its stated goal of providing consumer choice.

Where are the Labels?

During a short time period in the late 1990s, some food products in the EU were labeled as containing GM ingredients. According to Kalaitzandonakes and Bijman (2003) and Bernauer and Meins (2002), GM products then vanished in the EU. We found additional evidence in Japan, another country that has adopted mandatory labeling, where it is difficult (if not impossible) to find retail food products labeled as containing GM ingredients. Mandatory labeling also exists in Australia and New Zealand, where there is not much choice at the retail level.

Ironically, this fact has not been well publicized, and as a result many observers still question how anyone could be opposed to mandatory labeling if it provides information to consumers. Ignoring the current situation, some European newspapers have predicted that GM foods will "invade" the retail shelves with the new EU labeling regulations. This has not been the case so far with mandatory labeling; we believe the new EU regulations will do little to provide additional consumer choice.

Why does it matter? At the domestic level, we ask whether a policy is beneficial if it is intended to provide consumer choice but fails to do so. The policy results in additional taxpayer costs due to enforcement and testing. In addition, losses are experienced by those consumers who would prefer to buy lower-priced GM food products. More importantly, mandatory labeling acts as an import barrier and diverts trade. Mandatory labeling will impede the widespread adoption of GM food crops such as wheat and rice.

Labeling Provides Processor and Retailer Choice

Once labeling regulations are implemented, food processors and retailers are affected. For instance, opposition to GM foods is so strong in the EU and Japan that most consumers there are not ready to buy GM-labeled food. This means the processors and retailers are not ready to sell labeled final products in these countries. Therefore, if processors were using GM ingredients prior to the introduction of the labeling policy, they would then have to decide whether to keep the same formulation and label their final products, or switch ingredients to avoid labeling altogether. It turns out that most food processors selling into the EU and Japan have shifted ingredients away from GM due to perceived pressure from consumers and retailers. Shifting away from GM ingredients has not resulted in a significant cost increase for most processed food products, because the GM ingredients now available (i.e., corn and soybean material) typically account for a small cost share of

any processed food products. Thus, labeling provides processor and retailers' choice—not necessarily consumer choice.

The decision of these intermediaries is central to the outcome of any food labeling policy. Consumers will be part of their labeling decision *ex ante*, because retailers and processors will conduct marketing studies on consumer perceptions towards GM food. However, consumer choice may disappear *ex post*, because processors have to make a binary choice.

There are two essential factors affecting the decision of processors whether to label. First is overall consumer demand, which can be expressed as the expected share of the market willing to buy GM labeled food. The second and related factor is the profitability per unit of final product sold. The processors will estimate any cost savings associated with using GM instead of non-GM ingredients and compare these savings with the relative final product price of a GM-labeled versus non-GM (unlabeled) product.

Figure 1 represents the binary decision of processors. The horizontal axis measures the expected share of consumers buying GM-labeled products. This share will depend on the price difference between GM and non-GM and on the general degree of consumer aversion towards GM products. The vertical axis represents the ratio of non-GM to GM profit per unit. The upward-sloping curve is the isoprofit line, along which processors are indifferent between the two variants. To the left of the curve they will use non-GM ingredients, and to the right of this curve they will use GM ingredients. This figure helps to explain the observed market outcome with mandatory labeling.

Economic Incentives and Political Pressure

Under mandatory labeling, the costs of segregation and testing will be paid partly by taxpayers and partly by GM producers. This will keep the price premium between non-GM and GM products relatively low, because consumers buying non-GM products will not pay the full segregation and testing costs, as they would under voluntary labeling. In addition, experimental studies (Tegene, Huffman, Rousu, & Shogren, 2003) have shown that GM labels are perceived by consumers as a negative signal, and therefore they will lower the expected market share of GM in Figure 1. This latter effect of mandatory labeling will tend to push the equilibrium for food processors to the left of the isoprofit line in Figure 1.

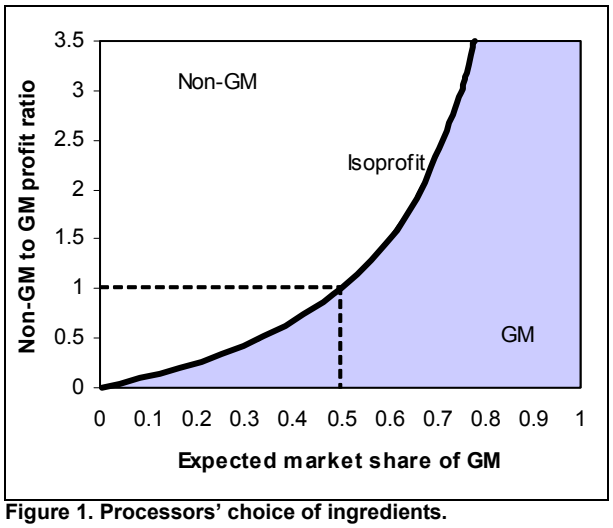

Figure 1. Processors' choice of ingredients.

In addition, GM crops currently available (the so-called first generation of agricultural biotechnology) generate economic rents for the seed companies and farmers but offer much less economic gain to food processors. Furthermore, if the processors are risk averse, they will expect a smaller profit for GM at any point because of the risk of a food crisis (such as the mixing scares of Starlink and Prodigene). Overall, because of the absence of a significant profit incentive and a low expected market share for GM products, most (if not all) processors will produce in the non-GM region in the northwest section of Figure 1.

This result is accentuated by the effects of political pressure. With mandatory labeling, it is easy for pressure groups opposed to genetic modification to target any product that displays a label and to launch a negative campaign against the processing firms (Knight, Holdsworth, & Mather, 2003). Most of the environmental activists who are opposed to GM foods strongly support mandatory labeling policies. Why would they do so if they knew that it would insure a place for GM food at the retail level? To the contrary, these groups may be using mandatory labeling as a type of Trojan horse: they support mandatory labeling for the sake of consumer choice, knowing full well that this policy will lead to no choice in practice. Moreover, even if there are some products that are labeled as a result, the products can be easily targeted by the activists.

Facilitating Consumer Choice with Mandatory Labeling

With the GM products currently available, the situation of little or no choice may not change quickly, because

processors face a first-mover disadvantage. The first processor deciding to use GM ingredients and to label will almost certainly lose (at least in the short run), as the firm will be exposed to political pressure and negative publicity. Therefore, even if they were expecting to make some additional profits, processors may decide to continue to avoid using GM ingredients under mandatory labeling.

In the long run, if consumer acceptance changed dramatically, some GM products would appear at the retail level. Better education and better information may improve the image of GM food in the minds of cautious consumers—especially if new GM products offer visible consumer benefits.

Current GM ingredients (i.e., corn and soybean products) are mainly used in highly processed food; they typically account for a small share of the cost of the final product. Therefore, the price and cost differences are small relative to non-GM ingredients. But it will be different with fresh products, such as fruits and vegetables. In this case, some of the cost advantage of GM will be transmitted to the processors and partially to the final consumers. These products will present a profit ratio under 1.0 (Figure 1), which means there will be more incentive for some processors and retailers to provide these GM products, perhaps leading to a coexistence of GM and non-GM products on the retail shelf.

Conclusion

Mandatory labeling provides food processors and retailers a choice, but it does not facilitate consumer choice. Because of rational food processor decisions, mandatory labeling acts as a market barrier, and GM products do not appear at the retail level. The mandatory labeling schemes in place today may be compared to a voting system with majority representation, where the winner takes all. Some consumers would probably buy GM products if they had the choice, but the mandatory labeling system does not give them any choice.

In contrast, voluntary labeling provides consumer choice as long as the maximum willingness to pay for non-GM products exceeds the corresponding price premium. This is why most economists argue that voluntary labeling is more efficient—it allows consumers to choose product quality. Voluntary labeling is like a voting system with proportional representation, where a share of the market may buy non-GM food, and the rest will buy mixed conventional and GM food.

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