Emerging Roles for Food Labels: Inform, Protect, Persuade

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Every day, food producers and processors provide products consumed by 250 million people in this country. Each of those consumers is affected by the content of their foods. With advances in food production, processing, and distribution technology, the role of food labels has become increasingly important. Current research and views related to food labeling issues were discussed at a conference held in Washington, D.C. on March 20-21, 2003. This article gives an overview of food-labeling issues and summarizes the research findings presented at the conference. Issues discussed in this paper include the impact of food labels on consumer purchase decisions, the role of the private versus the public sector in providing credibility to marketing claims, the costs and benefits of voluntary and mandatory labels, and the implications of country-of-origin labeling.

Every day, food producers and processors provide products consumed by 250 million people in this country. Each of those consumers is affected by the content of their foods. With the improvement of living standards, consumers have become increasingly concerned about health and general well-being. Today's consumers demand more information than ever about the attributes of their foods such as quality, nutrition content, production process, safety, and the origin of their foods (Henneberry 2003). On the supply side, a wide variety of foods carrying highly sophisticated qualitative attributes are available in the market. Scientific advances continue to increase consumers' knowledge about the various aspects of contemporary foods. Some of these aspects are related to quantifiable chemical characteristics such as nutritional composition, while others are related to qualitative characteristics that are not easily measured, such as health claims for prevention of diseases or improved fitness. Among other objectives, labels on foods have been used to satisfy consumers' increased demand for information and to help buyers make wise food choices.

With advances in food production, processing, and distribution technology, the role of food labels has become increasingly important. Both voluntary and mandatory labeling has been used in the U.S. and other regions of the world to disseminate information about the foods we consume. Labels are used to give information on nutritional content ("a good source of vitamin C"), country of origin, production process ("free of genetically modified ingredients" or "produced under fair labor practices"), to state health claims ("may prevent cancer" or "promotes cardiovascular health"), and/or to give warnings about the product ("may upset the stomach"). Nevertheless, food labels are all about quality (Clayton 2003).

Current research and views related to food-labeling issues were discussed at a conference held in Washington, D.C. on March 20–21, 2003. The conference featured speakers from industry, government, consumer-advocate groups, and academia, and provided a forum for discussing the issues surrounding food labels, such as country-of-origin labeling guidelines, intra- and inter-country economic impacts of food-labeling requirements, and industry-regulator relations. This article gives an overview of food-labeling issues and summarizes the research findings presented at the conference.

The Use of Labels to Gain Price Premiums

In general, firms have used voluntary labeling as a form of advertising to increase consumers' knowledge of certain attributes of their products. Just like any form of advertising, labeling is intended to increase the demand for the firm's product and to differentiate its product from those of competitors. This may in turn create potential for price premiums. The rather significant amount of producing firms' resources that is spent on advertising signals the market incentives for constructing successful label messages. In 1997, U.S. producers spent over 12 percent of domestic food expenditure on packaging and advertising, including labeling costs (Golan, Kuchler, and Mitchell 2000). But how effective has the use of labels been in increasing consumer demand and creating a market environment conducive to price premiums?

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McCluskey and Loureino (2003) show that consumers will pay a small premium for eco-labeled apples. However, their study concludes that it is difficult to garner a premium for apples based on "environmentally sound" practices. Compared to organic apples, eco-labeled apples may be a less-desirable choice for certain consumers who may perceive the organic apples to be safer and more environmental friendly. Roheim and Donath (2003) find that eco-labeled fresh seafood is favored over non-labeled fresh seafood, even where there is a price premium. However, their study also addresses the issue of whether consumers would switch from one species of fish that is not eco-labeled to another species that is eco-labeled. Their conclusion is that consumers will not switch just because of the label.

Labels to Guide Confused Consumers

Society's increased demands for safer, healthier, and more traceable foods stems from the increased ability to identify food characteristics and to detect foodborne illnesses. Public awareness of foodborne diseases, nutrition, and environment has led to an increase in demand for safer foods that involve an environmentally friendly production process. However, consumers' purchasing behavior does not always reflect their stated preferences. For example, people are uncomfortable about the production processes that use growth hormones and food irradiation, although these processes can produce safer foods (Shogren et al. 2002). Another example is the growing concern about chemical residues in or on foods. In spite of the concerns about chemical residues, many consumers are not willing to pay the premium for organic foods. However, some find the not-so-perfect appearance of organic foods appealing.

When it comes to biotechnology, surveys have shown that although consumers may state that they actively avoid biotech foods when asked through surveys, they act differently in the store by buying foods that are clearly labeled as biotech (McHughen 2003; Noussair, Robin, and Riffieux 2002). There is also no clear consensus toward biotech foods among consumers living in various parts of the world. While 53 percent of European consumers reject genetically modified foods as too risky and morally unacceptable, 64 percent of US consumers are either supportive of or neutral toward GM foods (Marks, Kalaitzandonakes, and Zakharova 2002). Even in the case of solid, factual information such as that listed on the nutrition panel, consumers' purchases do not always reflect rational choices. Circumstances such as hunger, a hectic schedule, and where we choose to obtain our food can overcome good intentions (Mancino and Kinsey 2002).

Labels may help confused consumers make choices that better reflect their preferences (correctly asserting their preferences). In the case of government intervention in labeling, one goal is to influence individual consumption choices to align them with social objectives (Golan, Kuchler, and Mitchell 2000). An understanding of the true costs and benefits of labeling is important when evaluating the net benefits of food labels to individuals and to society. The obvious benefit to the private firm of labeling can be measured in terms of price premiums and increased sales, while the observable costs involve those associated with labeling including the cost of chemical analysis, printing of labels, the verification associated with what is stated on the label, and the cost of third-party services to bolster the credibility of voluntary labeling. There are also costs associated with revealing more information to consumers that takes place when producers of different brands or different foods draw attention to the undesirable characteristics of the product.

Through better consumer protection and provision of information, labels may increase consumer welfare by helping them make informed choices (Verbeke and Ward 2003). However, research on whether labeling has been an effective policy tool in educating consumers and changing consumption behavior has been mixed. In other words, better behavior does not necessarily follow better and more information. Take the example of labels making nutrition and health claims. With the exception of poultry and meat labels, which are regulated by USDA, the Food and Drug Administration (FDA) primarily governs health claims while advertising claims are primarily under the jurisdiction of the Federal Trade Commission (FTC). The NLEA (Nutrition, Labeling and Education Act of 1990) made significant changes to the voluntary system of labeling originally established in 1973 by FDA. NLEA required mandatory nutrition labeling for almost all packaged food and set strict regulations for health claims. However, this policy has been costly to the producers and eventually to consumers in terms of higher food prices. The FDA estimated that over the next 20 years, the NLEA would cost the government

$163 million and the food industry $1.4 billion to $2.3 billion (Nayga 2003). More recently, the FDA has proposed changing key features of the labeling policy following several adverse First Amendment rulings from the courts (Ippolito 2003). The courts have discussed means to communicate scientific evidence to consumers in a way that would not mislead them, even if the science were still uncertain (Williams 2003).

The effectiveness of policy on food advertising and the subsequent impact on the quality of diet is an interesting question. The study by Ippolito documents the strong relationship between policy and the amount of food-advertising health claims. For example, in the late 1980s when the policy on food labeling was relaxed, the use of health claims rose sharply. However, when the rules were tightened in 1990, the use of health claims fell significantly. To assess the relationship between the regulatory events and the use of health claims, Ippolito uses various simple regressions that relate to time and to the key regulatory events the likelihood that an advertiser uses a claim. The study shows that there is no evidence of increased advertising in "good" food categories in the post-NLEA period, but some evidence of reduced advertising in certain food categories. Furthermore, the study finds that the reductions are significant in the "fats & oils" category targeted for reduced consumption, as well as in "fruits & vegetables" targeted for increased consumption. Nevertheless, since NLEA the two categories with significant net increases in the use of health claims include "fruits & vegetables" and "low-fat dairy products," which were targeted for increased consumption. In summary, in the post-NLEA period the number of "fruit & vegetable" advertisements fell sharply, but those producers who continued to advertise were more likely to use health claims.

In the last few decades many people in both the public and private sector have become more and more concerned about the increase in obesity and diabetes. One question is whether foods labels are as helpful as they can be in helping people select products that control weight gain (Williams 2003). In evaluating the effectiveness of food-labeling policy, Nayga (2003) shows that nutrition labels provide measurable benefits by improving diet quality as measured by the Healthy Eating Index (HEI). The endogenous switching regression technique was employed in the study to control for self-selectivity in the label-use decision and diet intakes. Moreover, the results of the study indicate that income and age are positively related to diet quality regardless of label use, and that people with at least some college education have a higher HEI than people with no college education. Interestingly, results show that employed label users have lower HEIs than do unemployed label users. Perhaps their having less time to spend on food leads to this finding.

On the international side, Ward and Verbeke (2003) investigated the information cues on meat labels in Europe that attract consumer interest. More specifically, they look at demographic profiles to see how consumers vary in terms of which cues they actually use in their purchasing decisions. They also examine the impact of a publicity campaign aimed at raising consumer awareness of the new beef-labeling rule in Europe. Ordered probit models were applied to cross-sectional data collected in Belgium for the analysis. The results suggest that different types of consumers in terms of socio-demographic characteristics want different information. However, through the use of promotion the firms can change what consumers value when making purchasing decisions. Moreover, while traceability and country of origin have legal importance, marketers must be careful not to overload consumers with information.

The Benefits and Costs of Labels

Besides the obvious benefits and costs, externalities involved in food production and processing may affect the net returns to labeling. For example, free riders may be an issue when the information on the label has a "public good" aspect pertaining to a whole product type and not just to the product that uses the label. In this case while many firms share the benefits, the costs are borne by a single firm (Golan, Kuchler, and Mitchell 2000). Also, the production, processing, and consumption of products may entail externalities resulting in social-welfare benefits and costs. These positive and negative externalities must be accounted for when measuring the net social-welfare effects of labeling.

For many years food labels were largely unregulated, truth-in-labeling. More recently, food labels have increasingly become a focal point for regulatory action, with a growing list of mandatory labeling requirements (Preston 2002). The general objective of U.S. federal intervention has

been to ensure fair competition among producers, to increase consumers' access to information, and to reduce risks to individual consumer health and safety (Hadden 1986). Whether or not food labels have accomplished the intended objectives is questionable. Golan, Kuchler, and Mitchell (2000) found that mandatory food-labeling requirements are best suited to alleviate asymmetric- or imperfect-information problems and are rarely effective in redressing environmental or other spillovers associated with food production and consumption. Asymmetric or missing information exists when the market does not supply enough information to allow consumers to make consumption choices mirroring their individual preferences (Golan, Kuchler, and Mitchell 2000). This occurs mainly in markets for foods with negative credence attributes. Mandatory labeling may also be used to impact consumption decisions to bring them more in line with what is deemed best for society. For example, with nutrition labeling and information on fat and cholesterol, consumers will hopefully reduce the amount of unhealthy food that they consume. This would lead to a healthier society, lower health-care costs, and higher productivity.

Crespi and Marette (2003) examine the use of public labeling with the goal of mitigating potential inefficiencies resulting from imperfect information about product characteristics. They distinguish between experience characteristics, where quality is revealed after purchasing, and credence characteristics, where quality is not revealed after purchasing--e.g., food safety, production process, GMOs, or ethical characteristics of products. They discuss the use of labeling to signal to the consumer the true characteristics of the products. With credence characteristics the absence of consumer detection makes labeling very important, since it is intended to transmit a credible signal to the consumer about the true characteristic of the product. However, with experience characteristics, the private sector under competition is likely to be more efficient than is mandatory regulation.

Process-based Labeling

Process-based labeling has attracted a lot of attention in recent years in light of controversies on genetically modified foods, concerns over animal cruelty, the use of chemicals in food production and processing, and the outbreaks of mad cow disease and other serious food-based illnesses. The objective of process-based labels is not only to inform consumers but also to shape the production process. Nevertheless, the effectiveness of process-based labels will be reduced once consumers realize the degree of subjectivity and unverifiability of process-based labels (McHughen 2003). Credence characteristics such as food safety, production conditions, GMOs, or ethical characteristics are unobservable qualities and are hard to measure. In the case of credence characteristics, the food industry alone cannot ascertain credibility—consumers may trust public agencies and consumer-action groups more than they do the food industry itself. Crespi and Marette (2003) point to research that shows U.S. consumers trust the safety claims of public agencies (in the case of food irradiation), while the majority of French consumers trust independent consumer-action groups more than they do the French public agency for food quality.

Roosen (2003) examines heightened European consumer concerns as a result of the successive food-safety crises and the measures taken in Europe in response to these concerns. These include labeling, traceability, and country-of-origin documentation. The use of private labels in Europe to signal quality and credence attributes is also examined. Her recent survey of European retailers shows that food safety and customer loyalty are the most important factors influencing their private-label policy. Statistical results from her study show that while concerns about biological food-safety hazards do not influence the level of importance consumers place on brands, these concerns do impact the level of importance consumers place on the country of origin.

McCluskey and Loureiro (2003) discuss research that shows that consumer response to GM food labeling depends on their country or culture. For example, Chinese consumers, who seem to place a higher value on technology, may respond to process-based labels entirely differently than do European and Japanese consumers, who may prefer foods that use traditional ingredients.

Although consumer demand has been the impetus for process-based labeling, McHughen (2003) points out the fundamental problems that arise both conceptually and practically in implementation of process-based labels. The main focus of McHughen's paper is GM foods. His study differentiates processed-based systems from product-based systems.

The main problems with labeling GM foods are the subjectivity of the definition and the verification of the impact of GM foods to human health and to environmental safety. Despite the advances in our knowledge about GM foods, there is still very little information about the technologies in use or about the regulatory processes established to protect us from potentially dangerous products (McHughen 2003).

The important economic concern about process-based labels is who would pay the cost of labeling. This cost is not necessarily paid by those demanding it and it may provide no additional health, safety or nutritional information to consumers. McHughen (2003) states that those demanding labels on GM foods are more likely to not purchase the foods because they fear such foods as potentially unsafe. He therefore concludes that the costs of mandatory process-based labels is borne mainly by consumers of non-GM foods and by the poor, people who don't care about labels anyway because they can't afford to discriminate. Furthermore, mandatory process-based labeling would involve a huge bureaucratic effort at a massive cost to society for the regulatory system that would be required to monitor and label every process undergone by every ingredient.

Crespi and Marette (2003) present research on the best way to finance public-inspection programs. For food-safety verification, a variety of user-financing schemes are used by food-safety agencies around the world. Crespi and Marette state that raising revenues for labeling imposes distortionary costs on the economy.

The U.S. dolphin-safe tuna program is another example of process-based labeling. Reacting to the high levels of dolphin mortality in the Eastern Tropical Pacific Ocean, Congress amended the Marine Mammal Protection Act (MMPA) and in 1990 created a highly popular consumer labeling program for "dolphin-safe tuna." This program outlawed the labeling of tuna caught by intentionally netting dolphins as "dolphin-safe." Other amendments required all nations exporting tuna to the U.S. to adopt dolphin protection programs "comparable" to that of the U.S. Despite broad public support in the U.S. Europe and an increasing number of countries in Asia, the U.S. dolphin-safe tuna program has become under attack by Mexico, Venezuela and several other Latin American countries as a trade barrier. The GATT upheld the labeling provision because it did not prohibit the movement of goods, and was applied equally to foreign and domestic products (Golan, Kuchler, and Mitchell 2000). Snape (2003) reports that although countries such as Mexico have gained market access in the U.S. as a result of the 1997 International Dolphin Conservation Program Act (IDCPA), the US "dolphin-safe" tuna standard has not changed to Mexico's liking because scientists continue to conclude that the practice of intentionally encircling dolphins is having a "significant adverse impact" on depleted dolphin populations. Mexico argues that it does not possess the market access that it desires, and has consequently threatened to take the U.S. before the WTO and to sue the U.S. tuna industry for damages. Snape's discussion focuses on the U.S. litigation that has ensued under the MMPA, and the legal prospects for another trade/environment battle at the WTO.

Country-of-Origin-Labeling

The US 2002 Farm Act amends the Agricultural Marketing Act of 1946 to require retailers to inform consumers of the country of origin for covered commodities. A voluntary program is in effect until September 30, 2004, when the program becomes mandatory. The term "covered commodity" is defined as muscle cuts of beef, lamb, and pork; ground beef, ground lamb, and ground pork; farm-raised fish and shellfish; wild fish and shellfish; perishable agricultural commodities; and peanuts. Perishable agricultural commodities are defined as fresh fruits and vegetables. One important question to be answered is whether consumers are willing to pay for Country-of-Origin Labeling (COOL).

Research by Umberger et al. (2003) quantitatively and qualitatively evaluates U.S. consumers' preferences for COOL of beef products. Through surveys and experimental auctions, consumers' preferences and willingness-to-pay (WTP) for COOL were elicited. Their research results showed that the surveyed consumers in Chicago and Denver were willing to pay a premium for COOL. The results also indicated that those who were willing to pay the most for the label believed the label signified increased food safety and quality. Umberger et al. (2003) state that additional research is needed to determine if the premiums are substantial enough to cover the additional costs associated with COOL.

Nevertheless, industry and producer views on the potential economic impacts of country-of-ori-

gin-labeling are mixed. Tim Hammonds (2003), the President of the Food Marketing Institute, describes the food industry's concerns about COOL. He refers to the industry's struggle to understand the COOL implications and the not-so-encouraging answers to questions regarding the impacts of COOL on the American agricultural and food-industry sectors. He explains, "The fact that no major supermarket company has joined the voluntary program, despite the fact that retailers have a long history of supporting consumer information, tells you all you need to know about whether this will be a good idea or not." He gives beef as an example and explains that as a result of COOL, beef will become more expensive relative to poultry, which is not covered under COOL and retailers will move increasingly to pre-packaged meats at the expense of in-store processing. He describes the negative impacts of COOL on ranchers who are unable to document the history of their animals. These ranchers will find themselves unable to sell to supermarkets forcing their beef into the export or food-service markets, which are not covered under COOL regulations. He also identifies the industry's concern regarding the cost of implementation of COOL.

Miller's (2003) presentation gives a different angle to views on the impact of COOL, one representing the Rancher-Cattlemen Action Legal Fund–United Stock growers of America (R-CALF USA) which is a non-profit association representing U.S. cattle producers in the areas of trade and marketing. Miller states that R-CALF USA strongly supports the mandatory COOL law and believes that U.S. consumers and producers will benefit from the law: "Producers will be able to focus their ongoing promotional investment toward their own products, not their competitor's. It will give consumers the power to determine how they want their beef produced and from where."

European experience with geographic-origin labeling of products has been successful. Marette and Zago (2003) describe the Apellation d'Origin Controllee (AOC) wines and the success in marketing of these often blended wines. They explain that wine making in the EU is very regulated and based on tradition, with a big role assigned to local wines sold under names generally associated with the production region. They further examine the competition that the traditional wine producers and exporters such as France, Italy, Spain, and Portugal face from the New World wine markers in Australia, California, Chile, and other emerging wine-producing countries. The results of their study show that it is profitable for producers to join forces in advertising to enter new markets. They further discuss the possible modifications of the AOC system to facilitate collective action and to improve investment levels.

Bureau and Valceschini (2003) also discuss the European Union's labeling policy on the geographic origin of products. The European policy benefits specialty products, such as wine from a given area, because of the reputation that is well-identified by consumers. However, bureaucracy, lack of international traceability of labels, and competition from registered brand names are limitations of the EU geographic-origin policy. They discuss that uncertainties exist with regard to future impacts of the EU policy given the growing globalization of markets.

Summary and Implications

This paper provides an overview of food-labeling issues and challenges faced by producers, processors and regulators in achieving their wide ranging objectives. The research results presented at the Food Labeling Conference give various views on the effectiveness of food labels in increasing market sales and improving social welfare. However, many questions remain unanswered. This indicates the need for future research on understanding private and social benefits and costs involved in food-labeling policies. Moreover, with recent WTO developments and economic globalization, research is needed on harmonization of food labels across the world for more-efficient marketing of agricultural and food products.

Caution is appropriate for policymakers, producers, processors, and various interest groups promoting increased mandatory labeling of food. Evidence indicates mixed consumer responses to process-based labeling. Whether the aggregate costs of labeling and their distribution outweigh the societal benefits that may accrue is an open question. How mandatory labeling is framed in policy and implemented through regulations will determine the costs involved. Sticking with labels that are based on well-documented science may be the prudent course of action, but research needs to be undertaken to evaluate the health and environmental bases for providing additional consumer informa-

tion through food labeling, as well as the costs and who should pay them.

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