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Country-of-Origin Labeling: Theory and Observation

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Abstract

This report examines the economic rationale behind the various claims about the effects of mandatory country-of-origin labeling, thereby identifying the most likely outcomes. Profits motivate firms to innovate and introduce thousands of new food products each year to satisfy consumers' demand. Yet, food suppliers have generally not emphasized, advertised, or labeled food with U.S. country of origin. The infrequency of "Made in USA" labels on food suggests suppliers do not believe domestic origin is an attribute that can attract much consumer interest. We find little evidence that suppliers would have difficulty supplying such labels if there were sufficient consumer interest.

Keywords: country-of-origin labeling, consumer demand, meat, fruit and vegetables, fish and shellfish, peanuts.

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Introduction

For many years, various agricultural and consumer advocacy groups have argued for legislation that would require food suppliers to provide consumers with country-of-origin information about food products. Among those favoring mandatory country-of-origin labeling (COOL) are several U.S. cow-calf producer and fruit and vegetable grower/shipper associations.¹ These groups argue that many U.S. consumers prefer domestic products to imported. They claim consumers would use these labels to help alleviate their food safety concerns, to support U.S. producers, and to guide their preference for U.S. foods of a perceived higher quality. The recent instances of bovine spongiform encephalopathy (mad-cow disease) in the United States and in Canada, labeling proponents argue, further emphasize the urgency of COOL. Domestic sales would increase with labeling, proponents contend, and this may translate into higher prices and increased returns to U.S. producers.

Opponents counter that consumers have little interest in country-of-origin labeling; that the costs of labeling, recordkeeping and operating procedures necessary to support required COOL would be onerous, especially for red meats (if individual animals must be traced); and that international trade agreements might be violated. Opponents claim that Americans may wind up with fewer food choices and that the costs of COOL would be passed forward to consumers, raising food prices (or backward to producers, raising their costs). U.S. cattle feeder and hog finishing operations, meat

packers, processors, and retailers have generally opposed required country-of-origin labeling. The Canadian government, on behalf of its cow-calf and farrowed pig operations, indicated strong objections to mandatory country-of-origin labeling and apprehension that labeling might reduce U.S. Canadian animal trade (Crosbie, 2003).

In 2002, Congress amended the Agricultural Marketing Act of 1946 by incorporating COOL in the Farm Security and Rural Investment Act of 2002 (Public Law 107-171, henceforth denoted the Farm Act or Law) and Supplemental Appropriations Act of 2002 (Public Law 107-206). USDA issued specific guidelines for voluntary labeling in 2002 that are currently in effect. USDA proposed mandatory labeling rules in October 2003. The Farm Act states that mandatory COOL is to be promulgated no later than September 30, 2004.² However, in response to a growing chorus of criticism, Congress recently agreed to delay COOL for 2 years to revisit some of the legislative requirements and perhaps make COOL voluntary. The 2-year delay will apply to meats, produce, and peanuts, but not to farm-raised and wild fish.

This report assesses the economic rationale behind the various claims about the effects of COOL, thereby identifying the most likely outcomes. It contains analysis and cost estimates previously published in the Department notices in the *Federal Register* (2003).

¹ For a comprehensive overview of positions, see *Mandatory Country of Origin Labeling* Hearings before the Committee on Agriculture, House of Representatives, www.agriculture.house.gov.

² See references for the *Federal Register* 2002 and 2003. The proposed rule is available on the Agricultural Marketing Service's COOL website at www.ams.usda.gov/cool. Public comments are welcomed until February 27, 2004.

Background

Basic Details of Mandatory COOL

The Farm Act and the proposed rule would require that retailers identify legibly the country of origin on red meats (beef, lamb, and pork), fish and shellfish, fresh and frozen fruit and vegetables, and peanuts (covered commodities). In addition, fish and shellfish must be identified as either wild or farm-raised. Retailers may use a label, stamp, mark, placard, or other clear and visible sign on the covered commodity, or on the package, display, holding unit, or bin containing the commodity at the final point of sale. Retailers need to indicate the specific country of origin for imported covered commodities including U.S. country-of-origin products.

COOL is not required if these foods are ingredients in processed food items.³ Examples of processed food items under the proposed rule include bacon, orange juice, peanut butter, bagged salad, seafood medley, and mixed nuts. In contrast, COOL would be required for canned salmon, bagged lettuce, and canned roasted and salted peanuts since they are nonprocessed foods from a single covered commodity. Foodservice establishments are exempt from COOL requirements. Under the proposed rule, such establishments include restaurants, food stands, and similar facilities including those within retail stores (delicatessens and salad bars, for example). Moreover, grocery stores that have an annual invoice value of less than \$230,000 for fruit and vegetables are exempt from all COOL requirements. Consequently, retail food outlets like butcher shops and fish markets that do not sell fruit and vegetables are not included under COOL requirements.

Informing Consumers: A Complicated Task

Retailers are required to inform consumers of the country of origin at the point of sale. While this proposition may seem straightforward, our globally

integrated food system blurs distinctions as to which food product is from the United States, from another country, or of mixed origin. A discussion on identifying where food originates may not be that much different than the more familiar question, "Where was this automobile produced?" Cars can contain parts manufactured in many countries, and may be assembled in multiple countries as well.

Under the Law and proposed rule, retailers can designate the United States as the country of origin only if the food is exclusively a U.S. product. For meat, this means that it is derived from an animal born, raised, and slaughtered in the United States. For wild fish, the product must be harvested in U.S. waters or by a U.S.-flagged vessel and processed in the United States or aboard a U.S.-flagged vessel. Farm-raised fish must be hatched, raised, harvested, and processed in the United States. Fruit, vegetable, and peanut products must be grown in the United States.

Under the proposed rule, if not exclusively a U.S. food product, labels for meats or fish are required to reveal their mixed origins. A product is of mixed origin when the final production step occurs in the United States but one or more prior production steps occur outside the United States. For example, pork that is derived from a hog imported from Canada and raised and slaughtered in the United States needs to be labeled as such. Blended products such as ground meats may be particularly difficult to label. Ground beef is typically a mixture of parts of many animals, blended to achieve particular composition of lean meat and fat. Trimmings with higher fat content may come from domestic and imported cows (usually United States, Mexico, and/or (historically) Canada), while lean meat may come from imported beef (usually Australia, New Zealand, and/or Canada). Proposed COOL rules necessitate preserving each specific origin in the blend in alphabetical order. For example, a label for ground beef may read:

*"Product of Australia; Imported from Mexico,
Raised and Slaughtered in U.S.A.; Product of
U.S.A."*

for ground meat that is made from a combination of meat imported from Australia; meat derived from cat-

³ The proposed rule defines a processed food item to be an item derived from a covered commodity that has undergone a physical or chemical change and has a different character, or an item derived from a covered commodity that has been combined with either other covered commodities, or other substantive food components resulting in a distinct retail item that is no longer marketed as a covered commodity.

tle born in Mexico but raised and slaughtered in the United States; and meat derived from cattle born, raised, and slaughtered in the United States.

To ensure that labels are accurate, origin information must be maintained and transferred along the supply chain, a potentially complicated process. Sectors like organic foods routinely maintain and transfer origin information along with other product attributes. For other sectors, especially red meat suppliers, this may be a new and unfamiliar activity.

Recordkeeping, Compliance and Enforcement

The Farm Act and the proposed COOL rule have stringent requirements on the depth of recordkeeping. First, the supplier responsible for initiating the country-of-origin declaration must establish and maintain records that substantiate the claim. If a firm already possesses records, then it is not necessary to create and maintain additional information. In a vertical supply chain, there must be a verifiable audit trail to ensure the integrity of the traceability system. Firms along the supply chain must maintain records to preserve country-of-origin information from the immediate previous source and to pass along COOL information to the subsequent recipient of the transaction. For an imported product, the traceability system must extend back to at least the port of entry into the United States. Firms have flexibility in the types of records that need to be maintained and in the systems that transfer information.⁴ Records need to be kept for 2 years.

Under the provisions of the Law, the Secretary of Agriculture can fine retailers up to \$10,000 for each willful violation. Prior to the fine, the Secretary must give the retailer a 30-day period to comply. Since retailers do not directly have information on country-of-origin, they are dependent on a supply chain that can verify the country-of-origin claim. Producers and handlers who supply covered commodities to retailers are also subject to penalties of \$10,000 per violation. Compliance reviews will be conducted at retail establishments and suppliers subject to the Law. Under the

proposed rule, only USDA is able to initiate enforcement actions against violators.

Current Federal and State Country-of-Origin Laws

Currently, country-of-origin labeling is required for many imported foods, although not necessarily at the retail level. The Farm Act expands country-of-origin labeling requirements for the covered commodities. The Tariff Act of 1930 as amended, the Federal Meat Inspection Act as amended, and other legislation requires most imports, including many food items, to bear labels informing the "ultimate purchaser" of their country of origin. Ultimate purchaser has been defined by the U.S. Bureau of Customs and Border Protection, which administers the Tariff Act, as the last U.S. person who will receive the article in the form in which it was imported. The law requires that containers (for example, cartons and boxes) holding imported fresh fruit and vegetables must be labeled with country-of-origin information when entering the United States. If produce in the container is packed in consumer-ready packing and sold to the consumer, then that item must already be labeled as well. Consumer-ready packages, such as grapes in bags or shrink-wrapped English cucumbers, although they are packed in a box, must have country-of-origin labels on each consumer-ready package. In contrast, a retailer may take loose produce out of a container and display it in an open bin, selling each individual piece of produce that has not been labeled. Until mandatory COOL takes effect, the bin need not be labeled under current federal law.

If the food is destined for a U.S. processor or manufacturer where it will undergo "substantial transformation," that processor or manufacturer is considered the ultimate purchaser. As a result, imported livestock, meat, and other items have not been required to carry a country-of-origin mark after slaughter, cutting, or processing in the United States. Processing of these products is covered by the same health and food safety regulations as domestic products.

USDA's Food Safety and Inspection Service (FSIS) and Agricultural Marketing Service (AMS) have issued other standards that allow voluntary labeling of fresh beef and other products. Agencies have, prior to COOL, allowed terms such as "U.S.A. Beef" or "Fresh American Beef" to indicate that beef was derived from animals born, raised, and slaughtered in the United

⁴ USDA's Agricultural Marketing Service has posted a list of documents on their website for producers, processors, and retailers to consider when establishing records for verification purposes, www.ams.usda.gov/cool/records.htm. During a compliance audit, USDA auditors will review any and all documents to the extent necessary to arrive at an accurate decision on the level of compliance.

States. The label "Product of the U.S.A." has been allowed, indicating that beef has been prepared in the United States. All approved labels must be accurate, truthful, and not misleading. In addition, any claims made on the label must be supported through documentation.

Eight States have their own COOL requirements for at least one of the covered commodities (GAO, 2003).⁵ Generally, State requirements cover only a small set of

commodities and have less demanding verification requirements than COOL. For example, Florida's program mainly covers fresh produce, does not require a verifiable audit trail, and only requires imported products to be labeled. In Florida, State inspectors compare display areas with shipping containers to verify labels. In Louisiana, fresh and frozen meats are included in their country-of-origin labeling program, but U.S. meat is defined as meat processed at a U.S. processing plant (GAO, 2003). Thus, imported animals could be used to produce meat labeled "Product of U.S.A."

⁵ The eight States are Alabama, Arkansas, Florida, Louisiana, Maine, Mississippi, North Dakota, and Wyoming.

Voluntary Country-of-Origin Labeling

Innovation in the U.S. Food System

The U.S. food system puts about 300,000 food products on store shelves around the country, with approximately 10,000 new product introductions each year (Harris et al. 2002). This long list of foods embodies an even longer list of attributes. In fact, so many attributes are marketed in the domestic food supply that opposite types of demand can be satisfied. For example, some products are labeled "low fat" while others are labeled "rich and creamy."

Why do food companies continually try to innovate and offer new attributes to consumers? Sensory and some credence attributes (product characteristics consumers cannot verify, like animal feeding practices, organic foods, or origin) are thought by suppliers to influence consumers' purchase decisions, and thereby raise profits. If there is money to be made from marketing a new attribute, profit-seeking grocery retailers, food manufacturers, and producers would voluntarily market the "new" or "improved" food item, clearly noting the desirable attribute. Grocers would demand that food manufacturers' supply the new product and that they ensure the attribute claims, as would manufacturers of farmers. In effect, firms innovate to meet consumers' demand. Firms' profit-driven attempt to find and advertise the right mix of attributes means that consumers usually end up knowing a lot about foods that they purchase.

Sometimes information about a product's attributes is not transparent. Competition among firms, though, gives consumers the opportunity to deduce more complete information (Ippolito and Mathios, 1990). For example, the producer of a food product low in fat might voluntarily advertise that fact. A competitor with a similar product low in both fat and sodium would have an incentive to advertise its product's two desirable attributes. Consumers might be careful about products that failed to make both claims. This competitive disclosure, which Ippolito and Mathios named the "unfolding" theory, results in explicit claims for all positive aspects of products and allows consumers to make appropriate inferences about foods without claims. The unfolding theory implies that the presence of advertising (including labels) is a signal of quality and that competitive products without such advertising alert consumers to its absence.

Unfolding occurs even if consumers incorrectly presume unlabeled foods to be domestic. As many foods are of domestic origin, some consumers may mistakenly believe that few foods carry domestic origin labels because almost all foods are of domestic origin. Or consumers might mistakenly believe that meat with a USDA grade means that the meat is derived from animals born, raised, and slaughtered in the United States. Suppose these consumers (provided with country-of-origin information) would, in fact, discriminate between domestic and imported foods. A firm that emphasized its products' domestic origin might gain a competitive advantage over rival sellers (as might be the case for firms currently selling meats with other credence attributes, like no added antibiotics or hormones). Consumers would note that rival products carried no claims of domestic origin and might consider them less desirable. Sales of voluntarily labeled U.S. products would likely expand.

Use of Voluntary Country-of-Origin Labels

U.S. country-of-origin labels are not often observed on food products and in retail advertising. Where they occur, the label is not as prominent as other attributes. The infrequency with which voluntary country-of-origin can be observed suggests that food suppliers see little or no advantage in labeling domestic products as domestic. In other words, any additional profits are believed to be less than the additional costs. There are at least four possible explanations for not often observing voluntary U.S. country-of-origin labels.

Consumers might not care where their food comes from. Foods compete primarily on the basis of taste and price, and marketing efforts abide by this. Consumers are most likely to choose domestic over imported foods (or the reverse) when they can distinguish price or sensory differences. If country of origin does not influence consumers' actual buying behavior, grocers or food manufacturers that did offer country-of-origin labels would not see increased sales or price premiums but would incur the costs of labeling, recordkeeping, and segregating domestic and imported products. They would likely not continue labeling for very long.

Some analysts argue that origin does not matter to U.S. consumers (Blank, 1998). They argue, for example, that fast food restaurants emphasize price, flavor,

portion size, and promotional toys, and rarely mention origin. It would not be unusual for a fast-food hamburger to be made from Florida tomatoes, California lettuce, Mexican onions, a bun fabricated from U.S. wheat, with Mexican sesame seeds, and a meat patty composed of lean meat from Australia and trimmings from the United States. Yet, this information is seldom, if ever, conveyed to consumers.

The lack of domestic country-of-origin labels on meat products is especially informative. It suggests that most consumers neither give the product's country of origin much thought nor view imported products as inferior. This may be because FSIS allows meat imports only if the products meets U.S. safety standards. If some consumers were concerned about the safety of imports and were willing to pay a premium to compensate sellers for segregation and recordkeeping, a niche market at least for domestic meats would develop. The absence of this market suggests that most consumers seem to trust and accept the assessment of food safety regulators that imports are as safe as domestic meat products.

Consumers might prefer the imported product.

The lack of domestic labels could mean that consumers want to know the origin of food products, but view some imported products as superior. In some cases, firms draw attention to an imported product by using product labels and advertising country of origin. The suggestion to consumers is that the import embodies top quality and deserves a premium price.

One such example is lamb imported from New Zealand or Australia. Currently, Australian lamb is labeled and advertised widely in the United States with 1- and 2-page ads in food magazines. The labeling goes far beyond existing legal requirements and proposed label requirements. Recent data show that this marketing approach by New Zealand and Australia has generated gains in sales and market share for imported lamb.⁶

Geographic indicators are probably the best examples of the unfolding theory in action. Geographic indicators have been used for centuries to suggest quality. Burgundy wine and Parma ham command premiums because of the quality associated with these products.

That these manufacturers fight to keep others from using their origin claims testifies to the magnitude of the premiums they earn.

Similar examples can be found throughout U.S. grocery stores. Grocery bins sometimes identify the country of origin for fresh fruit and vegetables even when there are no legal requirements.⁷ Here, the foreign exporters are choosing to set quality standards, so their country's label becomes associated with superior quality.

In contrast, U.S. food suppliers would have little incentive to supply a "Made in U.S.A." label for foods where domestic product quality varies widely. Instead, individual firms promote their own brands or try to align their products in consumers' minds with a smaller, specialized group of products. In 1999, food-related advertising in the United States for processed foods alone amounted to \$7.2 billion (Harris et al., 2002).

Consumers might prefer domestic products, but not enough to cover labeling costs. Even if consumers do favor domestic over imported products, labeling costs may outweigh the benefits from increased demand. When these costs raise price, consumers may choose not to purchase the product. Clearly, this is not the case for specific geographic indicators in the United States. Producer groups have for many years voluntarily labeled products such as Vidalia onions, Idaho potatoes, and Washington State apples. Consumers associate these products with a certain quality, or characteristic, for which they are willing to pay.

Consumers demand labels, but markets are not efficiently functioning (there is a market failure).

Like other credence characteristics, country of origin is not an attribute that any consumer can taste, smell, or see. For example, without a label on the package, tuna caught by a Mexican-flagged vessel is indistinguishable from tuna caught in the same waters by a U.S.-flagged vessel. Similarly, consumers have to decide whether they trust country-of-origin information. Without that trust, labels cannot influence consumer choices. For attributes where consumers have to decide on the trustworthiness of food suppliers, firms sometimes find it is difficult to convince con-

⁶ See "Livestock, Dairy, and Poultry Outlook," various issues, Economic Research Service, USDA, www.ers.usda.gov/publications/ldp.

⁷ Only prepackaged items must be labeled under current U.S. Customs requirements.

sumers that label information is credible. In principle, market conditions may make it impossible for truthful food suppliers to convince consumers that labels are reliable. For instance, if consumers were aware that some firms often falsified information, consumers might discount information from all firms, including those that advertised truthfully. Thus, there may be a role for government in making sure that information markets work efficiently (that is, correcting the market failure) by ensuring that information is reliable and truthful.

USDA has, in effect, offered to solve this problem. FSIS oversees labels on meat products. FSIS labeling policy allows fresh muscle cuts of beef and lamb to be identified as "U.S. beef" or "U.S. lamb" so long as the statement is truthful. AMS has offered a voluntary program to certify that livestock, meat, and meat products originate from the United States and are eligible to be labeled as "U.S. beef." The voluntary program certified that certain livestock and meat products have been produced from livestock born, raised, slaughtered, and processed in the United States.

Under that program, USDA offered to remove the major stumbling block for labels: verification and certification. To certify U.S. origin, AMS would audit production and processing records. In an earlier FSIS report on country-of-origin, FSIS noted that there were no participants in the voluntary program (FSIS, 2000).

The program continues to be offered, without participants to date, suggesting that the argument for market failure is weak.

Markets may also fail because of insufficient competition in some segments of the food industry. For example, many analysts have pointed to the livestock-meat supply chain to examine questions of concentration and market power. However, the importance of market structure for country-of-origin labeling is not in the economic incentive to label, but in the distribution of profits from labeling. If consumer demand creates an economic incentive to label, market structure is not likely to be a stumbling block. A monopoly, a small group of large firms, or a large group of small firms could all be expected to behave similarly—they would label and enjoy the profits from doing so. Of course, the monopoly might be in a position to dictate how the profits are distributed along the supply chain. A firm with market power and ability to set prices might be the one that takes most of the profits from labeling. Retailers and processors might not pass much of the profits back to farmers, for instance. Retailers and processors tend not to support mandatory COOL, suggesting that they believe that consumers may not be willing to pay a price premium for country-of-origin labeling. Again, the argument for market failure due to labeling is weak.

Mandatory COOL: Impacts on Food Supply, Demand, and International Trade

Examining Supply and Demand

Estimating benefits and costs from mandatory country-of-origin labeling will remain somewhat tentative as long as consumer demand for labels and labeling costs are imprecisely measured. To reveal the range of possibilities, in which consumers and suppliers of covered commodities may be affected by mandatory COOL, we examine two cases:

- (1) where markets are performing efficiently, and
- (2) where markets fail to supply labels some consumers want.⁸

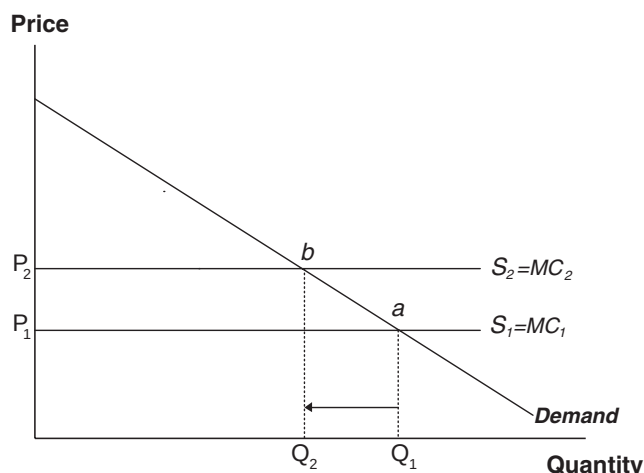
The first case shows conditions under which there are costs, but no benefits to mandatory COOL. The second case shows conditions under which there are benefits to label-conscious consumers but that costs are imposed on all consumers of labeled commodities.

Case 1. Figure 1 represents Case 1 for a covered commodity. All consumers are represented by the downward sloping demand curve (as prices rise, the quantity demanded by consumers falls). Food suppliers are characterized by a horizontal supply curve—constant average and marginal costs (MC) of production.⁹ The intersection of the supply curve S_1 and consumer demand curve D_1 determine the initial equilibrium price P_1 and quantity Q_1 of the covered commodity (point a).

In this first case, mandatory country-of-origin labels do not change consumers' willingness to purchase the product. COOL affects consumer choices through its impact on price. This is because firms would have voluntarily provided labels if consumers were willing to pay for their costs; the demand curve would already reflect this preference. Instead, mandatory COOL

Figure 1

Labeling leads to additional costs



only imposes costs—costs of labeling, recordkeeping, and changes in operating procedures. These costs can be analyzed as if the industry were subject to an excise tax. Assuming a competitive food supply industry, the cost of labeling will be passed forward to consumers.¹⁰ We indicate that change by adding a constant cost per unit to the supply curve, shifting it upward to S_2 , parallel to S_1 .

As consumers face a higher price, they buy less of the covered commodity (equilibrium defined by point b implies purchases fall from Q_1 to Q_2). They are worse off.¹¹ In a competitive industry, food suppliers are modeled as earning a normal rate of return on their efforts and consequently pass the new costs forward to consumers. As consumers are less willing to purchase at the higher price, the industry must contract. So, some suppliers must exit the industry.

⁸ For ease of presentation, this section treats suppliers as a unit, without distinguishing between retailers, handlers, and farmers.

⁹ We assume there are no specialized resources used in food production and the industry supply (S) can expand or contract at the current price. An upward sloping supply curve would not alter our conclusions except to distribute the costs of COOL to both consumers and suppliers.

¹⁰ An upward sloping supply curve would be implied if suppliers were able to pass some of the costs of mandatory COOL to producers by lowering the prices that they pay for the covered commodities.

¹¹ The conventional measure of consumer welfare, consumer surplus—the area below the demand curve and above price—is larger under P_1 than under P_2 .

Case 2. In figure 2, we show demands of two consumer groups: a relatively large label-conscious group and a small group indifferent to label information. We relax the assumption of market efficiency. We assume that markets do not provide incentives to sell labeled foods—label-conscious consumers cannot substitute labeled for unlabeled foods, nor can they buy domestic commodities with certainty. They can only assume or use their knowledge about the food to determine whether an item is a domestic product.¹²

Intervention to correct the market failure means that all covered commodities are labeled as U.S.- or foreign-origin. Unlabeled items cannot be sold. So, overcoming the market failure by implementing country-of-origin labels means substitution of unlabeled for labeled foods must be impossible for consumers.

Under these conditions, we can compare demand before and after mandatory labeling (points a and b). For label-conscious consumers who are willing to pay for and use label information, demand would increase with mandatory labels. Whether these consumers are better off with mandatory labeling depends on the relative size of their willingness to pay for label information and the cost of providing the information. Costs may exceed benefits even for the consumers who value the label information. Figure 2 is drawn to show the case in which willingness to pay is slightly larger than the increase in cost and price. Purchases by the label-conscious group increase slightly, and these consumers are better off despite the higher price. Purchases by consumers indifferent to labels fall in the face of higher prices, and these consumers are worse off.

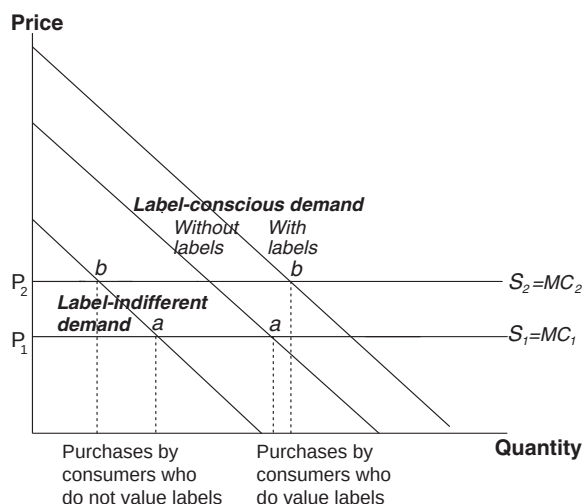
Overall, it is uncertain whether consumers gain or lose. Moreover, even though most consumers are assumed to be label-conscious consumers, total quantity demanded will likely still fall. As in the first case, the number of suppliers of the covered commodities must contract even though firms pass on the cost to consumers.

So, we have distinguished between indifferent and label-conscious consumers, but not between U.S.- and foreign-origin products. Implicitly, we assume that the increase in demand by label-conscious consumers is

¹² In many cases, this may be sufficient since most covered commodities sold in the United States are produced domestically. Moreover, many consumers know that tropical and out-of-season products are likely to be imported.

Figure 2

Intervention that corrects market failure benefits label-conscious consumers but imposes costs to all consumers



for U.S.-covered commodities, although this may not necessarily be true. In contrast, the decrease in quantity demanded by label-indifferent consumers would be for domestic and imported products. Since most covered commodities are of domestic origin, it is likely that the decline in quantity demanded from label indifferent consumers are mostly U.S. origin commodities.

Of course, we could construct examples with other outcomes. If label-conscious consumers were more willing to pay for labels, their demand schedule would shift farther to the right than indicated in figure 2. That is, the increased purchases by label-conscious consumers conceivably could exceed the reductions in purchases by label-indifferent consumers. In that case, suppliers would expand production. But it is difficult to find any evidence of market failure, or that label-conscious consumers represent more than a niche market.

Examining Exports and Imports

Since mandatory COOL creates adjustments in demand and supply, it also influences both exports and imports of covered commodities. U.S. exports are likely to decline as a result of mandatory COOL. As implied by figure 1, the larger labeling, recordkeeping, and operating costs associated with mandatory COOL may be passed along as higher prices to both domestic consumers and potential foreign buyers. This would reduce U.S. global competitiveness for the covered commodities and U.S. exports would consequently decline.

Some food suppliers may avoid COOL costs by designating their products for the export market since exports are not subject to the country-of-origin specifications. However, many supply chains cannot easily separate their production processes for domestic and export use. For example, to maintain COOL information for just one cut of meat to be sold at retail, COOL information would be needed on the entire animal and its carcass—there is no way to single out just one cut for COOL verification. Higher costs for segregation would affect exports as well, and make them less competitive.

The effects of mandatory COOL on imports may be more complicated than the effect on exports. We have assumed that the costs of mandatory COOL would affect domestic and imported covered commodities equally. However, if COOL requirements are more difficult for domestic suppliers to satisfy, COOL would encourage the use of less expensive imports. In contrast, if mandatory COOL makes it difficult for firms to prove they have not commingled imported and domestic commodities, it may discourage imports to avoid segregation costs. Several economists have examined the potential effect of mandatory COOL on covered commodities and on livestock.¹³

Imports could increase. Kerr (2003) reasons that the relative cost of country-of-origin regulations for beef and pork may be less for Canadian and Mexican products than for U.S. products. Hence U.S. meat imports would be expected to increase. This is because Canada and Mexico would only have to label "Product of Mexico" or "Product of Canada" when commodities leave processing plants in Mexico and Canada. Origin does not have to be traced further. Meat products originating from animals that were fed and/or processed in the United States, whether they were of domestic origin or from imported animals, would need a verifiable audit trail identifying the supply-chain origins.

Imports could decrease. Mandatory COOL would likely increase the costs of segregating and managing imported cattle and hogs. If feedlots and meat packers need to segregate animals not born and raised in the United States from U.S. animals, the two would need

to be transported, penned, and slaughtered separately. According to Hayes and Meyer (2003), this may not be as much of a problem for hog farrow-to-finish operations, where animals are processed in groups, as it would be for cattle. In contrast, cattlemen often buy and sell individual livestock at auctions and subsequently mix animals on their farms. Thus, the segregation costs are more likely to be greater for cattle than hogs and may require individual rather than batch identification. An individual animal identification system would be costly and a mandatory system to enforce COOL is prohibited by the legislation (see box, "U.S. Animal Identification"). Beyond the segregation of cattle, boxes and retail packs of meat would also need special labeling and handling. These costs are likely to discourage imports of animals.

Assessing the Impacts of Mandatory COOL

Figures 1 and 2 present only simplified versions of the effects of mandatory COOL for one food sector. To quantitatively estimate the economic impacts of mandatory COOL, two steps need to be undertaken. First, direct incremental labeling, recordkeeping, and operating costs must be estimated for the suppliers of the covered commodities (that is, how much costs change). Second, those cost estimates must be incorporated into an economic modeling framework that simulates how consumers and producers adjust their purchases, sales, and how much prices respond to the direct incremental costs of mandatory COOL (that is, what are the shapes of the demand and supply schedules). Only after the adjustments are made to reach a new equilibrium can we determine what the impact of mandatory COOL is on sales, prices, and international trade.

Furthermore, to fully understand the effects of mandatory COOL, a comprehensive economic framework is required that integrates the covered commodity sectors with other farm and food sectors—particularly food inputs like feed grains and substitute products like poultry—and the rest of the U.S. economy. Economists often use a computable general equilibrium (CGE) model for such a task. A CGE model can trace the impacts of the incremental increase in operating costs through the agricultural sector, the U.S. economy, and the rest of the world.

Using a CGE model developed by Economic Research Service, we simulated the potential effects on the U.S.

¹³ In addition to Kerr, see Hayes and Meyer, Lusk and Anderson, Peel, and Plain and Grimes, among others.

economy of mandatory COOL under a high and low cost estimate for COOL implementation.¹⁴

The results indicate that U.S. production of the covered commodities combined plus livestock would experience a modest decline, and trade would decrease relative to the base period. Moreover, the overall price level for these commodities would increase, which reduces consumer welfare (see box, "Estimating the Impact of Mandatory COOL").

¹⁴ See the following articles for more information about the CGE model used: X. Diao and A. Somwaru, "A Dynamic Evaluation of the Effects of A Free Trade Area of the Americas: Intertemporal, Global General Equilibrium Model" *Journal of Economic Integration*, Vol. 16(1), March 2001; X. Diao and A. Somwaru. "An Inquiry on General Equilibrium Effects of MERCOSUR-An Intertemporal World Model," *Journal of Policy Modeling*, Vol. 22, 5, 2000; and X. Diao and A. Somwaru. "MERCOSUR and U.S.; An Intertemporal General Equilibrium Evaluation of Regional Integration," *International Economic Journal*, Vol. 113, No. 1 Spring 1999.

U.S. Animal Identification

A national animal identification plan is being developed through a cooperative effort of USDA, State animal health officials, and livestock industry groups (www.usaip.info)—called the National Identification Development Team. The Team's goal is to develop a national standardized program that can identify all premises and animals that had direct contact with a foreign animal disease within 48 hours of discovery. The plan is aimed at quickly identifying animals exposed to disease and the history of their movements in order to rapidly detect, contain, and eliminate disease threats (Wiemers, 2003). The first phase of the work requires establishing standardized premise identification numbers for all production operations, markets, assembly points, exhibitions and processing plants. The second phase calls for individual identification for cattle in commerce. Other food animal and livestock species in commerce would be required to be identified through individual or group/lot identification.

Estimating the Impact of Mandatory COOL

The costs of mandatory COOL depend on the number and difficulty of new activities that firms must undertake. Costs depend on the extent to which new activities differ from current production and marketing practices and how easily firms can adjust their practices. Firms may incur two main costs—labeling/recordkeeping and operating (identifying, segregating, and tracking animals and covered commodities). Firms engaged in transactions that involve domestic covered commodities or covered commodities from multiple country sources may need to adapt their operations in receiving, storing, processing, shipping, packaging, and displaying to comply with mandatory COOL.

In a cost-benefit analysis of the proposed rule, AMS estimates that direct incremental recordkeeping and operating costs would be between \$582 million and \$3.9 billion to create and maintain COOL information systems for the first year (*Federal Register*, 2003), with costs likely to fall in the middle to upper end of the range of the estimates. Approximately 1,339,000 U.S. firms are anticipated to be affected by the proposed rule. Some firms would have to undertake only small adjustments to their recordkeeping and operating systems, while others must make much larger changes. AMS made collective estimates based on industry studies, comments received on the Farm Act and voluntary guidelines, and knowledge of the industries.

Using AMS' lower and upper range cost estimates, the CGE model is used to simulate the effects of mandatory COOL on the U.S. and the world economy. U.S. production of all covered commodities combined would decline, on average, from 0.12 (low-cost case) percent to 0.30 (high-cost case) percent relative to the base period and the overall price level for these commodities would increase by 0.06 percent to 0.25 percent. The table contains the simulated percentage changes (from the base year) in prices, production, exports, and imports that could occur with mandatory COOL for each covered commodity.

Fish, fresh fruit, and vegetables are affected more by COOL than other covered commodities (see table). The demands for fruit, vegetables, and fish may be more responsive to changes in price than are the demands for other covered commodities. U.S. poultry meat suppliers also may be affected even though they are not directly covered by the rule. Consumers may substitute chicken for beef and pork when their prices increase relative to the price of chicken. The resulting increase in demand for chicken causes the price of both chicken meat and chickens (broilers)—and ultimately their production—to increase.

Model results indicate a more limited impact on the overall U.S. economy than the direct incremental costs for the first year alone would suggest. After 10 years' adjustment to COOL economywide purchasing power would drop \$138 million to \$596 million. This represents the cost to the U.S. economy after all transfers and adjustments in consumption and production patterns.

These estimates are based on the assumption that country-of-origin labeling does not shift consumer demand toward the covered commodities of U.S. origin (as illustrated in figure 1). There is no compelling evidence to support the view that mandatory country-of-origin labeling would increase the demand for U.S. products. Still, we examined how much of an increase in demand for U.S. origin commodities would have to occur to offset the costs imposed on the economy by the proposed rule. Demand at the retail level would have to increase between 0.4 to 2.05 percent.¹ For more detailed results see pages 61969 - 61974 of the proposed mandatory rule (*Federal Register*, 2003).

¹ Since not all retailers are subject to the proposed rule, the demand increase would equal 1 to 5.1 percent for those covered by the proposed rule.

Estimating the Impact of Mandatory COOL (cont.)

CGE models can be technically sophisticated and complex. The model used in this analysis is global in the sense that all regions in the world are covered. Production and consumption decisions in each region are determined within the model following behavior that is consistent with economic theory.

Multilateral trade flows and prices are determined simultaneously by world market clearing conditions. This permits prices to adjust to ensure that total demand equals total supply for each commodity in the world. The general equilibrium feature of the model means that all economic sectors are included. Hence, resources can move among sectors, thereby ensuring that adjustments in the feed grain and livestock sectors, for example, are consistent with adjustments in the processed sectors.

The model is static and this implies that gains (or losses) from stimulating (or inhibiting) investment and productivity growth are not captured. The model allows the existing resources to move among sectors, thereby capturing the effects of reallocation of resources that result due to policy changes. However, because the model fixes total available resources, it may underestimate the long-run effects of policies on aggregate output.

The CGE model uses data from the Global Trade Analysis Project (GTAP database, version 5.2). The database represents the world as of 1997 and includes information on macroeconomic variables, production, consumption, trade, demand and supply elasticities, and policy measures. The GTAP database includes 57 commodities and 76 country/regions. For this analysis, the regions were represented by the following country/ regions: the United States, Canada, Mexico, the European Union-15 (EU), Japan, Australia and New Zealand, South America (including Central America), and the Rest of the World.

The crop and livestock sectors are subdivided into the following eight commodity aggregations: food grains (rice, wheat), feed grains (corn, barley, sorghum), oil crops (oilseeds, peanuts), vegetables and fresh fruit, other crops (sugar, cotton), bovine cattle and sheep, hogs, and poultry. The food sector is subdivided into the following seven commodity aggregations: cattle and sheep meats (beef, veal, lamb, and mutton), pork, chicken meat, vegetable oils and fats, other processed food products, beverages and tobacco, and fish. The remaining sectors in the database were aggregated into one broad category of manufacturing.

Estimated impact of proposed rule on U.S. production, prices, and trade

	Prices	Production	Exports	Imports
	<i>Percent change from the base year</i>			
Low incremental cost:				
Fruit and vegetables	0.11	-0.15	-0.17	-0.20
Cattle and sheep	0.05	-0.14	-0.11	-0.06
Broilers	0.01	0.01	-0.00	0.02
Hogs	0.05	-0.07	-0.09	0.01
Beef and lamb	0.07	-0.15	-0.13	-0.10
Chicken meat	0.01	0.04	0.01	0.03
Pork	0.06	-0.17	-0.16	-0.12
Fish	0.15	-0.26	-0.27	0.01
High incremental cost:				
Fruit and vegetables	0.43	-0.49	-0.62	-0.26
Cattle and sheep	0.24	-0.33	-0.37	-0.08
Broilers	0.02	0.03	-0.00	0.03
Hogs .	0.07	-0.15	-0.16	-0.03
Beef and lamb	0.27	-0.34	-0.40	-0.25
Chicken meat.	0.11	0.07	-0.07	0.16
Pork	0.26	-0.39	-0.48	-0.08
Fish	0.64	-0.92	-1.04	0.22

Summary

The new U.S. Farm Act and proposed COOL rule would expand current Federal and state labeling requirements. COOL would require the transfer of information along the supply chain to affirm a covered commodity's origin, including the United States, up to the retail level. Creating, maintaining, and transferring the information to verify the source of U.S.- and foreign-covered commodities is necessary so that products are not mistakenly mislabeled at the retail level.

In our market-based economy, firms have a profit motive to innovate and satisfy consumers' demand. Thousands of new food products are introduced each year, based mostly on price and sensory attributes. Firms also introduce foods with credence attributes, like, organic foods. Food suppliers have generally not emphasized, advertised, or labeled food made in the United States, because they discount this attribute's

potential to attract sufficient consumer interest. Mandating that all U.S. covered commodities be labeled is not likely to change the quality of U.S.-origin products. We find little evidence that the market is not efficiently meeting the preferences of consumers for country-of-origin information and labels.

Finally, requiring COOL would add labeling, record-keeping, and operating costs for many suppliers of covered commodities and livestock. We incorporated those costs into a computable general equilibrium model to simulate what could happen to the food sector and the economy with the implementation of mandatory COOL. Production, exports, and imports of covered commodities would likely decline somewhat, with a small loss in economywide purchasing power resulting.

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