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Demand Shifts in Beef Associated with Country-of-Origin Labeling to Minimize Losses in Social Welfare

Daniel D. Hanselka, Ernest E. Davis, David P. Anderson, and Oral Capps, Jr.

A primary concern of the COOL program are the costs incurred by retail chain stores and distributors, meat packers and processors, and others in the supply chain. Since the release of the mandatory COOL program in the 2002 Farm Security and Rural Investment Act, a number of individuals and organizations have put forth estimates of the additional costs associated with the implementation of the mandatory COOL program. The various studies pertaining to the implementation and compliance of COOL have a broad range of cost estimates for numerous covered commodities. This article provides a cost assessment, based on survey results, for implementing COOL regulations for the beef industry, and an estimate of the change in demand for retail beef, wholesale beef, fed cattle, and feeder cattle needed to negate the increase in costs of implementing mandatory COOL.

The literature indicates that estimates of the costs to the beef industry range from \$200 million to \$5.9 billion dollars, although the upper estimate appears to be unduly large (see Hanselka, 2004, for details). But, in arriving at these cost figures, none of the studies used an in-depth, structured survey methodology of industry participants. This research collected financial and production data and information from surveys of prepared questions administered to various industry representatives in order to determine estimates of incremental COOL costs to the beef industry. The surveys were developed to collect actual company cost estimates and production data that would result from the implementation and compliance of COOL. Additional company costs regarding COOL implementation included both incremental and capital costs associated with identification, segregation, preservation, management, operational, labeling, labor, and other compliance and enforcement costs. The survey included

questions about identification and distribution changes that could occur as a result of the implementation of COOL, such as segregated production lines by origin or elimination of foreign origin beef processing.

Surveys were sent to the top 30 US cattle feeders and beef packers, as identified by *Cattle Buyer's Weekly*, an industry newsletter. The 75 largest grocery retailers, as identified by industry newsletters, also were surveyed. The surveys were sent out by registered mail to company officials identified as having operational knowledge of compliance costs. Follow-up calls were made to ask for help with the research, and additional survey copies were provided. Response rates were 50% for the stocker and feedlot operators, 30% for packers, and 11% for retailers.

The questions were developed by economists specializing in livestock and meat economics and meat scientists specializing in meat processing. The survey questions were pretested with several industry participants; adjustments were made to the questions based on their responses in order to make the survey more useable and answerable.

The retail chain store and distributor level costs for the beef supply chain were estimated to be approximately \$0.08 per pound of beef sold to reconfigure their meat departments to maintain product identity, to maintain required record-keeping at individual stores, and to place COOL labels on beef items in the meat case. An estimated \$16.99 per head was calculated for meat packers and processors to reconfigure their slaughter and fabrication departments to maintain segregation and identity of cattle into boxed beef. Costs for the cattle feedlot segment are estimated at \$12.94 per head for feeding segregation, data storage, and costs associated with tracking cattle. Finally, it is estimated that the additional costs of implementing COOL for cow-calf operators, cattle backgrounders, and

cattle stockers were about \$3.89 per head for identifying the movement of cattle and starting the passport transactions up to delivery of the animal to finishing. These were calculated as weighted averages, by volume, of the survey respondents.

Importantly, the cost estimates at each level of the marketing channel varied noticeably by firm. This variation is due, in part, to the specific management and production practices of the company and whether that particular company handles only foreign beef products or cattle, only domestic beef products or cattle, or a combination of foreign and domestic beef products.

We apply the estimated costs to actual beef industry production levels in 2003 in order to estimate the total costs incurred at each level of the supply chain in the beef industry. Using consumption figures of 18.9 billion pounds (retail weight) of beef in 2003 and assuming 52% was sold at retail, total incremental costs of the mandatory COOL program accruing to retail chain stores and distributors amounted to \$818 million. For meat packers and processors, given that 35.5 million head of cattle were slaughtered in 2003, total additional costs added to the meat packing sector amounted to \$603 million. Based on 27.6 million head of fed cattle marketed in 2003, total costs to the cattle feeding sector was estimated to be \$356 million. Feedlot placements totaled 24.9 million head of calves in 2003, yielding an estimated total incremental cost of \$97 million to the cow-calf producer, cattle backgrounder, and cattle stocker segments of the beef industry. For the beef industry as a whole, then, the estimated additional annual costs to satisfy COOL requirements would total \$1.9 billion using 2003 production levels. These cost estimates are com-

parable to those reported in the literature, albeit falling at the upper end of the spectrum.

Aside from estimating the incremental and capital costs accruing to each market level of the beef industry, this research also examined the changes in market demand, price, and overall economic welfare effects of COOL on all participants of the beef industry. Several studies have been conducted examining the market, social welfare, and revenue effects of COOL on the beef, pork, and poultry industries. Unlike previous studies, this research estimates the magnitude of increases in the demand for retail beef, wholesale beef, fed cattle, and feeder cattle needed to offset or negate the induced costs of COOL so that producers and consumers would be no worse off from an economic welfare standpoint. Economic welfare simply means the value consumers get from the product over what they paid for it and the revenue producers get from a product over the costs of producing it.

In order to estimate the necessary demand shifts, a model was developed using elasticity estimates previously published in the literature, as well as actual livestock and beef numbers. The changes in demand and prices are calculated to estimate the amount needed to offset the estimated incremental costs of COOL to leave the quantity moved through the supply chain and the welfare of those engaged in the beef marketing channel unchanged. The purpose for holding the original quantity constant is to determine the magnitude of the demand shift necessary at each marketing level to offset the increased COOL costs. By holding quantity constant, volumes are held constant in each production sector.

Livestock and beef quantities from 2003, elasticities of supply and demand supplied by Brester, et al., and the COOL compliance costs developed in the survey reported above were used to estimate the change in beef demand necessary to make producers and consumers just as well off. The model was solved using an Excel spreadsheet. The advantage of using a spreadsheet is that it allows for sensitivity analysis given varying assumptions on elasticities, quantities, and costs. This type of sensitivity analysis then could be performed using other estimates of costs, elasticities, and quantities for other years.

The results indicate that an increase of 1.2% in beef demand would be necessary for the welfare gains and losses in the retail sector to be zero. An increase in wholesale demand for carcasses of 0.8% would be necessary for the producers and consumers in the wholesale production sector to be no worse off economically. Finally, for fed cattle and feeder cattle markets, the results indicate that increases of 0.56% and 0.24% in demand for fed and feeder cattle, respectively, are necessary to leave welfare effects unchanged.

With this demand shift, retail beef price is estimated to increase by 2.4%. Similar to the retail market, the wholesale beef price is estimated to increase by 1.8%. Fed cattle price is estimated to increase by 1.4% and feeder cattle price to increase by 0.6%.

Whether the economic costs of COOL can be recovered ultimately depends on two factors: (a) the level of marketing and production costs that accrue at all marketing levels of the industry, and (b) the increase in demand at the various marketing levels needed to offset the costs of COOL. Based on this research, the

beef industry costs associated with the mandatory program appear to be large, totaling about \$1.9 billion. It would appear, however, that rather moderate shifts in demand at each level of the marketing channel are necessary to offset implementation costs, holding quantities constant. In any large industry like the beef industry, seemingly small shifts in demand can translate into large shifts in revenue. In this case, these results indicate that a 1.2% increase in beef demand at the retail level would offset COOL costs. The necessary demand shift is smaller in this work

compared to others in the literature because we look at beef alone, and we hold quantity constant. There is no interaction with pork and poultry where market share has to be recaptured. Holding quantity constant allows beef industry participants to maintain volumes produced. Given apparent increasing demand for beef in recent years, perhaps a one percent increase in demand at the retail level is possible. If so, then the implementation of COOL may not negatively impact those engaged in the beef industry along the marketing channel.

For More Information

Hanselka, D.D. (2004). *Economic impact of country-of-origin labeling in the U.S. beef industry*. Unpublished master's thesis. College Station, TX: Texas A&M University.

Daniel D. Hanselka is an extension associate, Ernest E. Davis is professor emeritus, David P. Anderson is an associate professor, and Oral Capps, Jr. is a professor and Southwest Dairy Marketing Endowed Chair in the Department of Agricultural Economics at Texas A&M University.