

# Animal Identification



WEMC FS#4-04 • Fall 2004

**Wendy J. Umberger,  
Ph. D.**

Assistant Professor and  
Agribusiness Extension  
Specialist

Department of  
Agricultural and  
Resource Economics

Cooperative Extension  
Service

Colorado State  
University

Fort Collins, CO

wendy.umberger@  
colostate.edu

## The National Animal Identification System and Country-of-Origin Labeling: How Are They Related?

### Overview

Two controversial issues currently facing the beef industry are the proposed National Animal Identification System (NAIS) and the 2002 Farm Bill's Country-of-Origin Labeling (COOL) provision. The relationship between the proposed NAIS and COOL programs is often misunderstood. This fact sheet describes the COOL program and how it relates to the NAIS. While the goals of these two programs are different, the NAIS will likely be complementary to the COOL program. However, because the mandatory COOL program statute states that the U.S. Secretary of Agriculture cannot require an individual animal identification program for implementation, mandatory COOL would not be able to supply the detailed traceback information that an individual animal identification system would provide. To understand how the two programs are related, this fact sheet first provides an overview of the COOL program, followed by a discussion of the controversy related to COOL and a review of the estimated costs versus benefits of COOL. This is followed by a synopsis of the differing and complementary aspects of COOL and the NAIS.

### What is COOL?

After being debated for several years, mandatory COOL was approved as Subtitle D of the Farm Security and Rural Investment Act of 2002 (2002 Farm Bill). The COOL provision amends the Agricultural Marketing Act of 1946 and requires that "... a retailer of a covered commodity shall inform consumers, at the final point of sale of the covered commodity to consumers, of the country of origin of the covered commodity" (USDA/AMS, 2002a). Covered commodities include ground and muscle cuts of beef, pork, and lamb, farm-raised and wild fish and shellfish, peanuts, and all perishable fruits and vegetables. The provision prohibits the U.S. Secretary of Agriculture from mandating an animal identification (ID) program for verification of country-of-origin; however, self-certification by suppliers is not sufficient.



Based on the 2002 Farm Bill statute, COOL is only a marketing program administered by the USDA Agricultural Marketing Service (USDA/AMS). Because this is a labeling program, the Act does not change the inspection processes and standards for United States and imported meat products currently provided by the USDA Food Safety and Inspection Service, nor does it change who can supply meat products in the U.S. market (Peel et al., 2003). As the Act states, COOL simply provides information to consumers regarding the country-of-origin of certain food products.

### **The COOL Debate**

Since 1999, COOL has been a topic of discussion at most national and regional beef producer meetings. The relatively low domestic cattle prices and increasing imports of Canadian and Mexican cattle during the late 1990s prompted beef producers in some regions of the United States to consider adding foreign-produced livestock products to the list of imported products that must be labeled with country of origin (Brester and Smith, 2000).

The beef industry has been and continues to be split over whether a mandatory COOL law (versus a voluntary set of guidelines) would be beneficial to the beef industry. A number of arguments exist, both in favor and against a mandatory COOL law. Producer-proponents of COOL believe that labeling would provide U.S. producers the opportunity to create a competitive, differentiated product market for U.S. beef. Producers in favor of COOL reason that U.S. consumers would

select U.S. beef products, thus increasing the market share of U.S. beef relative to imported beef.

Labeling advocates also contend that consumers have a “right to know” where their food products originate. They argue that U.S. consumers know where their cars and clothes are produced, therefore, they should have the same information for their food. After all, they assert, food is a consumer good that has the ability to impact consumers’ health after consumption. In addition to consumers’ “right to know,” some proponents claim that COOL would provide consumers with increased food safety assurance. COOL supporters have increasingly used this food safety argument after the May 2003 single Canadian case of Bovine Spongiform Encephalopathy (BSE, commonly called Mad-Cow Disease) and the December 2003 Washington state isolated BSE case in the United States.

Opponents of the law believe that COOL would be too difficult and costly to implement. A 2000 U.S. congressional study determined that the potential costs associated with implementation of a COOL system would outweigh the benefits due to comingling of imported beef with domestic beef products. Challengers of the labeling law believe these costs would ultimately be passed on to the consumer. This could potentially have a negative impact on beef demand if consumers shift their consumption away from beef and to competing meat products such as poultry, which is exempt from the 2002 COOL requirements. Further, labeling adversaries argue that consumers may develop a taste for international, imported food prod-

ucts (as it happened with Japanese cars in the 1980s), resulting in reduction of the U.S. market share for beef (Loureiro and Umberger, 2003).

Additionally, other adversaries of COOL are concerned that the label is a non-tariff trade barrier and U.S. meat exports could suffer a significant reduction as a result of COOL. For example, government officials from major beef trading partners such as Australia, Canada, and Mexico have argued that COOL is a non-tariff trade barrier; therefore, the law may violate World Trade Organization (WTO) and North American Free Trade Agreement (NAFTA) agreements. Finally, opponents of mandatory COOL argue that the beef market is consumer-driven, that there is no evidence of consumer demand for mandatory COOL, and if there were evidence, major firms would be voluntarily labeling country-of-origin.

### **Current Controversies Related to the 2002 Farm Bill's COOL Program**

The controversy over COOL became even more intense after the 2002 Act was written and passed and the USDA/AMS promulgated their regulations for COOL. Many of the current concerns about COOL stem from how the law was written in the 2002 Farm Bill. Both proponents and opponents of mandatory COOL are calling the law, as written, the “law of unintended consequences” (Umberger et al., 2003a). The products and institutions exempt from the COOL regulations trouble proponents of COOL. Processed food products, poultry and dairy products, food service establishments

(hotels and restaurants, cafeterias), and retailers with less than \$230,000 per year in fruit and vegetable sales are all exempt from the mandatory COOL law. Many argue that these exemptions produce an unfair advantage for the poultry sector and put the beef and pork industries at a competitive cost disadvantage. Furthermore, a large share of the beef consumed in the United States will not be labeled, due to the fact that approximately 40% of beef in the United States is sold through the hotel and restaurant sector, which is exempt. Many have asked why some meat products and food establishments are exempt if consumers have a “right to know.”

Other concerns have been raised regarding the labeling requirements of the 2002 Act. The COOL law explicitly states that only animals born, raised, and slaughtered/processed in the United States qualify for a United States country-of-origin label; however, the law does not provide regulations for labeling imported, mixed-origin or blended products. Both imported beef meat and live animals contribute to the U.S. beef supply. In 2002, 35.7 million head of cattle and calves were slaughtered in the United States. Approximately 7% of these animals were imported as either live feeder or fed cattle. Beef from these animals would be subject to “mixed-origin” labeling. Consumers’ perceived quality of beef from “mixed-origin” cattle likely differs depending upon the origin. Approximately 32% of the total live cattle imported into the United States (2.24% of the total U.S. supply of cattle) came from Mexico as feeder cattle in 2002 (500 to 700 pound animals). About 50% of the total live cattle

imports originate from Canada as cattle weighing over 700 pounds, and another 8.8% of the live cattle come from Canada as feeder cattle weighing between 500 and 700 pounds (Livestock Marketing Information Center, 2003; ERS, 2003).

In addition to live cattle imports, in 2002 approximately 18.9% of the 27.1 billion pound U.S. beef supply was from imported beef products (muscle cuts or beef trimmings rather than live animals). In 2002 the four largest importers of beef into the United States were Australia (35%), Canada (34%), New Zealand (19%), and Brazil (6%) (Livestock Marketing Information Center, 2003; ERS, 2003). Beef products imported from Australia, New Zealand, and Brazil are typically trimmings or ground beef, and are blended with U.S. beef products to create leaner products and would fall into the “blended-origin” category, while beef from Canada is typically higher value table cuts such as steaks and roasts and would tend to fall into the “mixed-origin” category of COOL, which is explained below.

Under the current USDA/AMS COOL guidelines (released in October of 2003), imported beef products from cattle produced entirely (born, raised, and processed) in any country other than the United States would be labeled as “Imported from Country X.” However, “blended-origin” meat products such as hamburger, which may contain meat products from multiple countries, would contain a label indicating in alphabetical order the different countries of origin of the meat. Additionally, under these 2003 labeling guidelines, meat produced from “mixed-

origin” animals such as a feeder calf imported into the United States from a country such as Mexico and finished in a U.S. feedlot would be labeled as “From Animals Born in Mexico, Raised and Processed in the U.S.A.” (USDA/AMS, 2003). Both labeling proponents and opponents have argued that labeling meat with “blended-origin” or “mixed-origin” would only confuse consumers.

Using these current USDA labeling guidelines for United States, imported, blended-origin, and mixed-origin product and the 2002 estimates of imports of live cattle and beef, about 88.7% of the higher valued steaks and roasts would be labeled as “U.S. Born, Raised, and Processed,” 4.7% would be labeled as “Product of Canada,” and the remaining 6.6% would contain a label indicating the beef was from mixed origin.

### **What Costs are Associated with COOL?**

Several studies have attempted to examine the costs associated with COOL. The estimated costs vary widely due to the necessary use of assumptions and speculation over how COOL will actually be implemented. There are three direct cost categories brought about by mandatory COOL: 1) the cost of preserving the identity of the animal, 2) the cost of labeling the products, and 3) compliance costs. In their initial estimated costs of federal COOL requirements, the USDA/AMS estimated that it would cost the industry \$1.9 billion in the first year to develop the required record-keeping system (USDA/AMS, 2002b). This study only evaluated the record-keeping requirements of COOL and did not study

other cost aspects such as potential changes in markets. A September 2003 General Accounting Office (GAO) study found that the USDA/AMS's estimated \$1.9 billion first-year record-keeping costs of COOL were questionable in four areas: 1) not all record-keeping would be a new burden, 2) fewer businesses (than the original USDA/AMS estimate) would actually need to keep records, 3) the number of hours required for record-keeping is uncertain (and possibly higher than originally estimated), and 4) the actual cost per hour of developing and maintaining a system is likely lower than original USDA/AMS estimates. The GAO report concluded that while some costs are lower than initially estimated, the USDA/AMS underestimated other costs.

A study submitted to the USDA/AMS in April 2003 by Sparks Companies, Inc. and Cattle Buyers Weekly (CBW) provided estimates of the cost of COOL for each segment of the meat industry that mandatory COOL would affect. For the beef industry, the costs range from \$4.88/head for the cow-calf producer, \$3.75 -5.75/head for the feedlot, \$15-18/head for the packer/processor and \$23/head for the retailer. In total the Sparks-CBW study estimates the total cost of mandatory COOL will be approximately \$0.10 per pound of beef, assuming that 8 billion pounds of beef from 35 million head of cattle are sold in the United States annually. Furthermore, according to the Sparks-CBW study, the sum of these estimated costs ranges from \$1.5 billion to \$1.7 billion annually. The Sparks-CBW cost study also estimated the cost of COOL to be \$0.075 per pound for pork and

similar amounts for fish and seafood. Based on the Sparks-CBW cost estimates, the beef industry would be at a competitive cost disadvantage to the pork and seafood industries. Several other studies have attempted to estimate the costs of COOL to the livestock industry (Davis, 2003; Hayes and Meyer, 2003; Krissoff et al., 2004; USDA/AMS, 2002b and 2003; VanSickle et al., 2003). These cost estimates vary extensively, ranging from millions to billions of dollars annually for the meat industry.

### **Are There Benefits from COOL?**

Consumers may value knowing the country-of-origin of a food product; however, they cannot identify the country-of-origin through experience, consumption, or visual inspection of the product. Therefore, country-of-origin is considered to be a *credence attribute* because truthful labeling of the attribute is the only method that enables consumers to search for and to experience the characteristic by choosing products labeled with their preferred country of origin (Caswell and Mojduszka, 1996). Typically, firms will voluntarily label a food product if the private benefits from doing so exceed the costs; however, there are only a few beef firms that are voluntarily labeling country-of-origin. Thus, if consumers truly value COOL and are not able to make purchase decisions because firms are not voluntarily providing the information to consumers, the mandatory COOL policy may be beneficial to consumers. A mandatory COOL program would be an appropriate policy tool if the following conditions are present: asymmetric information exists,

country-of-origin increases demand for the product, and the disclosure of possible negative quality attributes does not exceed the benefits. In credence attribute markets, there is typically asymmetric information between the producers, processors, retailers, and consumers of the product. What is not readily apparent is whether or not COOL would increase demand for beef (Golan et al., 2000).

As mentioned earlier, proponents of COOL believe that it would increase demand for beef because consumers believe U.S. beef is higher quality and safer than imported beef; thus, consumers would choose U.S. products over imported products. COOL would increase demand 1) if the same quantity of U.S. meat products sold at a higher price, 2) if a larger quantity of U.S. beef sold at the same price, or 3) if both the price and quantity of beef sold increased. Therefore, in order to understand how demand might change, one needs to examine whether or not consumers would be willing to pay a premium for COOL.

Two recent studies assess consumers' willingness to pay (WTP) for COOL. The results vary depending upon population studied and the methods used to elicit WTP. A supermarket survey of 243 Colorado consumers was conducted during the spring of 2002 to assess if consumers were willing to pay for a mandatory COOL program. The study found that Colorado consumers would be willing to pay an average of 38% and 58% more for "U.S. Certified Steak" and "U.S. Certified Hamburger," respectively (Loureiro and Umberger, 2003). The second WTP study on COOL was conducted in Chicago

and Denver during 2002 (Umberger et al., 2003b). Sixty-nine percent of the consumers were willing to pay a 19% premium for the "U.S.A. Guaranteed" steak over an unlabeled, generic steak. The most commonly mentioned reasons consumers preferred COOL of beef included food safety concerns, preferences for labeling source and origin information, a strong desire to support U.S. producers, and beliefs that U.S. beef was of higher quality. It is important to note that these studies used labels that were different from those that would likely be used in the COOL program.

While these results suggest a potential premium for U.S.-labeled beef over unlabeled beef, the premium would only exist in the marketplace if the supply of U.S.-labeled beef were less than the quantity demanded. In typical years, approximately 89% of the steaks and roasts and 75% of the beef trimmings sold in the United States are of U.S. origin (Plain and Grimes, 2003). Therefore, if only 69% of the consumers are willing to pay a premium for U.S. beef (Umberger et al., 2003b), premiums for U.S. beef would not exist because supply would exceed quantity demanded. Furthermore, because mandatory COOL requires that only retail meat has labeling, the potential exists (possible market incentive) for foreign-produced beef to be channeled away from retail markets to the hotel, restaurant, and institutional (HRI) sector. Foreign-produced beef has been perceived by some segments of consumers to be less palatable than U.S. beef, and other segments of consumers could either not tell a difference in taste or preferred the foreign-

raised beef (Umberger et al., 2002; Sitz et al., 2003). Thus, the effects on beef demand due to possible re-routing of mixed origin or foreign-produced beef through the HRI sector are not yet known. Regardless of consumer-perceived quality differences between U.S. and non-U.S. beef, and if all non-U.S. beef is sold through the HRI sector rather than retail outlets, 100% of the beef sold in supermarkets would be labeled as a “Product of the U.S.,” and inevitably there would not be a premium for U.S. beef.

These results and discussion begin to provide information on the complex question of how demand would be changed due to COOL. However, they do not compare the costs to the benefits. The majority of economic research shows little positive change in demand from COOL and substantial increases in costs. If estimated costs are anywhere close to the actual costs of COOL, it appears that there are few benefits to be gained from COOL for the beef industry and many gains for integrated poultry industry that will not be required to participate in the COOL program (Brester and Marsh, 2004; Lusk and Anderson, 2004). The ultimate benefits to consumers will depend upon whether COOL increases the quality and food safety of beef and if consumers value the additional information provided by COOL.

### **Issues Related to Verification of COOL**

Aside from the concerns about actual labeling requirements, there is also uncertainty regarding how a mandatory COOL system can be implemented in an auditable fashion.

As mentioned previously, the COOL legislation specifically prohibits the U.S. Secretary of Agriculture from creating a mandatory animal ID system to maintain an animal’s country-of-origin. Due to the diverse resources and structure of the cattle industry, most cattle change ownership several times before reaching the retailer. Moreover, while most of the animals shipped into the United States from Canada and Mexico are finished and processed in the western and plains states of the United States, sorting and mixing of imported animals once they are in the United States may occur several times as animals are moved from stocker, backgrounder, and feedlot operations (Shields and Mathews, 2003).

Without an individual animal ID system, producers and processors handling both imported and U.S. animals would have to transport and pen non-certified U.S. animals separately, and processors would have to operate separate lines in order to maintain source ID for possible audits. Maintaining country-of-origin identity for each beef animal is likely a costly and onerous task without some form of an individual animal ID or segregation system. While the USDA cannot mandate an animal ID system for the purpose of certifying and maintaining information needed for a mandatory COOL program, the law would allow someone else involved in the supply chain (for example a retailer or processor) to require it from their supplier in order to provide an auditable trail. Additionally, the COOL regulation states that the U.S. Secretary of Agriculture may require a “verifiable record-keeping audit trail” to prove compliance. Two alternative mechanisms, “segrega-

tion” and “traceability,” would help with implementation of an auditable mandatory country-of-origin labeling system (Hayes and Meyer, 2003).

Traceability involves the development of a comprehensive animal ID or “traceback” system permitting a meat product to be traced from the end-consumer to the original animal and farm. A traceability system would require increased information sharing and additional costs amongst all sectors of the supply chain: retailers, wholesalers, packers, feedlot and stocker operations, cow-calf producers, and seedstock producers. Unless the system is mandated and/or subsidized by the government, livestock producers believe it is likely that most of the costs associated with implementation of a traceability system would have to be assumed by the U.S. livestock industry and would impart a cost advantage to the U.S.’s competitors in the export market (Hayes and Meyer, 2003).

While the costs would likely be high, there are potential long-run benefits from a traceable system such as increased food safety and possible economic rents to producers from branding their products. At least initially, the NAIS will be a voluntary and technology-neutral system. Several animal ID projects funded or subsidized by the government are currently being initiated to test the efficiency of various ID technologies and data gathering methods. Because it is not yet known what technology will be used, and exactly how the government will be involved in the NAIS, the costs and the allocation of costs throughout the beef and dairy industries are not yet known.

Segregation could be a lower cost alternative for producing U.S. meat than traceability; however, COOL through segregation would not enhance the ability to rapidly trace an animal to its farm of origin. Segregation would involve each participant in the marketing channel verifying that a specific pen of cattle or batch of product was of U.S. origin. Individual animal identity would not need to be maintained. A segregation system may not significantly impact the cost of producing U.S. livestock products, but it might substantially lower the price of imported and mixed-origin products in the market (Hayes and Meyer, 2003).

### **COOL Versus the NAIS**

Some proponents of COOL believe that if the United States had a mandatory COOL policy in place at the time of the December 2003 BSE incident, then traceback of other animals potentially connected to the Washington dairy cow would have been easier. This is not likely due to one of the most controversial aspects of the COOL program: the fact that COOL does not provide any individual animal traceback. In fact, as previously mentioned, the law states that COOL cannot be used to implement an individual animal tracking system. The COOL system only allows ID of a meat product’s country-of-origin by stage of production: where the animal was born, where it was raised, and where it was processed. This is a form of food traceability, but only to the extent that it provides country-level information. Therefore, in the December 2003 case, meat from the affected dairy cow (which was born in Canada, but raised and processed in the United States) would



have been labeled as “Born in Canada, Raised and Processed in the United States.” Investigators would have known that the animal was born in Canada, but they would not necessarily be able to trace it to the farm-of-origin.

The purpose of the NAIS is to provide live animal traceability to accelerate trace-back investigations in the cases of disease outbreaks and to maintain animal health. The goal of NAIS is to be able to trace animals to their farm-of-origin (and all other premises and animals with which the animal had contact during its life cycle) within 48 hours. The NAIS is based off of the U.S. Animal Identification Plan ([www.usaip.info](http://www.usaip.info)), which only focuses on tracking animals from birth to slaughter. Therefore, the public benefits of the NAIS system include improved tracking of animals and improved animal health.

The NAIS system does not enhance food safety by itself, because it does not allow for traceback once the animal reaches the processing stage (currently, most meat products are only traceable from the retailer back to the processor by lot number). An individual animal ID system such as the NAIS would have assisted in tracking the herd mates of the “index” cow involved in the December 2003 U.S. Mad Cow Disease case. Therefore, the NAIS increases the surveillance capabilities and feasibility of tracking animals involved in animal health and disease occurrences by recording animals’ origin and lifetime movements. The NAIS would provide the necessary documentation at the producer level for COOL. However, because COOL is a retail-level labeling program, the NAIS does little to assist in identifying country-of-origin at the processor or retailer level.

## Summary

Both COOL and the NAIS will continue to remain controversial programs. COOL is a food-labeling program providing consumers with information on the country-of-origin of certain food products at the retail level. NAIS is a live animal traceability program with the objective of improving surveillance and traceback of animal disease and health issues. Neither COOL nor NAIS is a food safety program. However, the NAIS substantially increases the U.S. government’s ability to respond to animal health and disease outbreaks, thus helping to ensure the safety of animals and meat products that could still enter into the food supply chain. Additionally, the NAIS would simplify implementation of COOL at the producer level.

While implementation of the NAIS seems certain, the future of a mandatory COOL program is less certain. In January 2004, Public Law 108-199 was signed into law, postponing implementation of the mandatory COOL program for all commodities except wild and farm-raised fish and shellfish until September 30, 2006 (USDA/AMS, 2004). More recently, in June 2004, a voluntary COOL bill was introduced to Congress. Regardless of whether COOL becomes a voluntary or mandatory program, the associated traceback costs of labeling country-of-origin are inevitable: the NAIS would complement either type of COOL program (voluntary or mandatory) and would alleviate many of the issues related to verification of COOL. The distribution of costs and benefits from either program will remain uncertain. Other factsheets provide insight on these related issues.

## References

- Andersen, R.S., and S. Kay. "COOL Cost Assessment." Published by the Sparks/CBW COOL Consortium. April 2003. Online. Available at <http://www.ams.usda.gov/cool/comments/cool1041.pdf>.
- Brester, G.W., J.M. Marsh, and J.A. Atwood. "Distributional Impacts of Country-of-Origin Labeling in the U.S. Meat Industry." *Journal of Agricultural and Resource Economics*. 29(2)(August 2004):206-227.
- Brester, G.W., and V.H. Smith. "Beef at the Border: Here's the Beef." *Choices*. (2<sup>nd</sup> Quarter 2000):28-32.
- Caswell, J.A., and E.M. Mojduszda. "Using Informational Labeling to Influence the Market for Quality in Food Products." *American Journal of Agricultural Economics*. 78(5)(1996): 1248-1253.
- Davis, E.E. "Estimate of Start-up Costs for Country of Origin Labeling Requirements to the Texas Beef Cattle and Beef Sectors." Texas A&M University Extension Fact Sheet. (July 2003). Online. Available at <http://livestock-marketing.tamu.edu/publications/Start%20Up%20COOL.html>.
- U.S. General Accounting Office/GAO. *Country-of-Origin Labeling, Opportunities for USDA and Industry to Implement Challenging Aspects of the New Law*. GA0-03-780. Washington, D.C., August 2003. Online. Available at <http://www.gao.gov/new.items/d03780.pdf>
- Golan, E., F. Kuchler, L. Mitchell, C. Greene, and A. Jessup. *Economics of Food Labeling*. Agriculture Economic Report No. 793. Economic Research Service, U.S. Department of Agriculture, Washington, D.C., 2000.
- Hayes, D.J., and S.R. Meyer. "Impact of Mandatory Country of Origin Labeling on U.S. Pork Exports." White Paper. Center for Agricultural and Rural Development, Iowa State University, Ames, Spring 2003.
- Krissoff, B., F. Kuchler, K. Nelson, J. Perry, and A. Somwaru. "Country of Origin Labeling: Theory and Observation." Electronic Outlook Report from the Economic Research Service. United States Department of Agriculture, Washington, D.C, January 2004.
- Loureiro, M.L., and W.J. Umberger. "Estimating Consumer Willingness to Pay for Country-of-Origin Labeling." *Journal of Agricultural and Resource Economics*. 28(2)(August 2004):287-301.
- Lusk, J.L. and J.D. Anderson. "Effects of Country-of-Origin Labeling on Meat Producers and Consumers." *Journal of Agricultural and Resource Economics*. 28(2)(August 2004):185-205.
- Peel, D.S., C. Ward, D. Lalaman, and D. Gill. "Frequently Asked Questions about Country of Origin Labeling (COOL) and the Implications for the Beef Industry." Oklahoma State University. March 18, 2003. Online. Available at <http://agecon.okstate.edu/livestock/articles/coolfaq.doc>.



- Plain, R., and G. Grimes. "Benefits of COOL to the Cattle Industry." Department of Agricultural Economics Working Paper, University of Missouri, AEW 2003-2, 2003. Online. Available at <http://agebb.missouri.edu/mkt/cool.htm>.
- Shields, D.A., and K.H. Mathews, Jr. "Interstate Livestock Movements." United States Department of Agriculture, Economic Research Service. LDP-M-108-01. June 2003. Online. Available at <http://www.ers.usda.gov/publications/ldp/jun03/ldpm10801/ldpm10801.pdf>.
- Sitz, B.M., C.R. Calkins, W.J. Umberger, and D.M. Feuz. "Consumer Acceptance and Value of Beef from Various Countries of Origin." 2004 Nebraska Beef Report, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln. MP 80-A, 2004.
- Umberger, W.J., D.M. Feuz, C.R. Calkins, and K. Killinger. "U.S. Consumer Preference and Willingness-to-Pay for Domestic Corn-fed versus International Grass-Fed Beef Measured through an Experimental Auction." *Agribusiness: An International Journal*. 18(4)(Autumn 2002):491-504.
- Umberger, W.J., D.R. Mark, and D.M. Feuz. "Mandatory Country of Origin Labeling: the Ongoing COOL Debate Continues in Kearney." *Cornhusker Economics*. Department of Agricultural Economics, University of Nebraska-Lincoln, May 21, 2003a. Online. Available at [http://agecon.unl.edu/mark/Papers/CH\\_5-21-03.pdf](http://agecon.unl.edu/mark/Papers/CH_5-21-03.pdf).
- Umberger, W.J., D.M. Feuz, C.R. Calkins, and B.M. Sitz. "Country-of-Origin Labeling of Beef Products: U.S. Consumers Perceptions." *Journal of Food Distribution Research*. 34(3)(November 2003b):103-116.
- U.S. Department of Agriculture/Agricultural Marketing Service. *2002 Farm Bill Provisions, Subtitle D - Country of Origin Labeling*. USDA/AMS, Washington, D.C., May 2002a. Online. Available at <http://www.ams.usda.gov/cool/subtitled.htm>.
- U.S. Department of Agriculture/Agricultural Marketing Service. 2002 Federal Register. Vol. 67. No. 225, USDA/AMS, Washington, D.C., November 21, 2002b. Online. Available at <http://www.ams.usda.gov/cool/ls0216.htm>.
- U.S. Department of Agriculture/Agricultural Marketing Service. *Mandatory Country of Origin Labeling of Beef, Lamb, Pork, Fish, Perishable Agricultural Commodities and Peanuts*. Federal Register. Vol. 68, No. 210, USDA/AMS, Washington, D.C., October 2003. Online. Available at <http://www.ams.usda.gov/cool/ls0304.pdf>.
- VanSickle, J., R. McEowen, C.R. Taylor, N. Harl, and J. Connor. "Country of Origin Labeling: A Legal and Economic Analysis." Paper No. PBTC 03-5, International Agricultural Trade and Policy Center, University of Florida, Gainesville, May 2003.

