



A Statement from the Editors

Welcome to our second issue of *Choices*. We would like to draw your attention to several changes we have made during our editorship and then ask for your help.

- First, we have tried to improve the accessibility of *Choices* to those who want a hard copy. With this issue, we introduce a whole issue PDF copy that people can download and, if desired, print.
- Second, we are trying to improve the referencing characteristics of *Choices*. We have defined a volume number and page numbers across the whole document to allow typical journal referencing style. We are also peer reviewing all pieces so *Choices* is without question includable in the refereed article section of a vita.
- Finally, we have included references to a page we will keep updated on our thematic coverage schedule, indicating both past and future topics. In that list, the timing of distant pieces may not always be right, but the list of covered topics will be. We provide this as we have discovered a number of people who want to join the theme and others that were surprised to find that an idea they had was already in progress.

Beyond this, we would like to request your help in two ways:

- First, please send us content. High-quality issues require high-quality content; we would like to see the profession help us by contributing more content. We would really like to see a significant increase in the number of thematic submissions and an enhancement in the stream of Grab Bag submissions. For submission requirements, see <http://www.choicesmagazine.org/submissions.htm>.
- Second, please help us reach people with mailing lists who can join in our outreach partner campaign. See our plea and forms to nominate or agree to be a partner at <http://www.choicesmagazine.org/outreach.htm>.

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Washington Scene: On the Hill

Ag Committee Leaders—109th Congress. Republican Representative Bob Goodlatte of Virginia continues as Chairman of the House Committee on Agriculture. Republican Senator Saxby Chambliss of Georgia is the new Chairman of the Senate Committee on Agriculture, Nutrition, and Forestry. He succeeds Senator Thad Cochran of Mississippi, who is the new Chairman of the full Senate Committee on Appropriations. Democratic Representative Collin Peterson of Minnesota is the new Ranking Member (senior minority party member) of the House Committee. He succeeds Representative Charlie Stenholm of Texas, who was defeated for re-election. Democratic Senator Tom Harkin of Iowa continues as the Ranking Member of the Senate Committee.

Budget. Concerns over continuing federal budget deficits could lead to “budget reconciliation” in 2005. If budget reconciliation were to occur, most, if not all, authorizing committees would be required to “share the pain” of reducing the deficit in a coordinated fashion by developing legislation to reduce spending on their mandatory programs. (Mandatory spending is spending other than through annual appropriations). For the Agriculture Committees, mandatory spending programs include food stamps and other nutrition, commodity, conservation, crop insurance, selected research, export, forestry, transportation, and rural development programs.

Livestock Issues. The committees will provide input and oversight on a number of livestock issues including the fol-

lowing: the US BSE surveillance program, BSE and beef trade with Canada; BSE and beef trade with Japan; a national animal identification system; country-of-origin labeling; and reauthorizing mandatory price reporting (authority expires in September, 2005).

Trade Issues. The committees will provide input and oversight on a number of trade issues including the following: BSE and beef trade with Canada; BSE and beef trade with Japan and other countries in Asia; the Doha Round negotiations in the WTO; a number of bilateral and subregional negotiations on trade agreements, including those with Thailand, Panama, three Andean countries, and selected Middle East countries; the Central America Free Trade Agreement; and the US-Brazil WTO cotton case (a WTO decision on the US appeal is expected in early March).

Futures Markets. The committees will be reauthorizing the Commodity Futures Trading Commission, the independent federal agency that oversees the trading of futures contracts in the United States in accordance with the Commodity Exchange Act. As part of the reauthorization process, the committees will consider whether changes to the CEA are needed to improve market oversight.

Farm Bill Hearings. The House will start preliminary hearings on the next farm bill. (The current farm bill expires in 2007). Hearings will be held both in Washington, DC, and around the country.



Country-of-Origin Labeling and the Beef Industry

David P. Anderson and Oral Capps, Jr.

Country-of-origin labeling (COOL) was probably the most contentious issue to come out of the 2002 farm bill. This issue of *Choices* features COOL as one thematic contribution. Some agricultural and consumer advocacy groups, notably US cow-calf producer and fruit and vegetable grower and shipper associations, have argued for legislation that would require suppliers to provide consumers with country-of-origin information about food products. Opponents to COOL—in particular, US cattle feeder and hog finishing operations, meat packers, processors, and retailers, have countered that the costs of labeling, record-keeping, and operating procedures would be extremely burdensome. Congress amended the Agricultural Marketing Act of 1946 and mandated COOL for beef, lamb, pork, poultry, fish, and other agricultural commodities as part of the Farm Security and Rural Investment Act of 2002. Initially, according to this act, COOL was to be put into operation by September 30, 2004. However, in response to much criticism, Congress agreed to delay the implementation of COOL until 2006. This delay applied to meats, produce, and peanuts, but not to farm-raised and wild-caught fish. Arguments over its implementation and start-up dates continue at this time, keeping COOL a hot issue.

Interestingly enough, the economic impacts of COOL for the affected commodities had been studied very little, if at all. There was no information on the benefits of COOL; it was not clear whether consumers would pay a premium for the information. It was assumed by proponents that, of course, consumers were clamoring for that information and would pay more for it. There were no estimates of COOL costs, but costs are heavily dependent on implementation requirements, which were not known until the USDA released a final rule. Cost estimates that surfaced after the farm bill was passed depended on assumptions about how to interpret the law. COOL may be a good example of supporting and passing a law that

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sounded good at the time without really knowing what the benefits and costs were going to be. Given the continued controversy surrounding COOL, this issue of *Choices* pulls together current research on costs, benefits, demand shifts, willingness-to-pay (WTP) issues, and a look ahead at potential industry changes.

In this issue of *Choices*, we examine who will bear the costs of COOL in the beef, pork, and poultry sectors; the demand shifts needed for those engaged in the beef industry to be no worse off under COOL; the premium, if any, consumers are willing to pay for COOL-labeled meat; and the potential impact of COOL on the vertical coordination/vertical integration strategies in the beef industry. Emphasis is placed on the impacts of COOL associated with the beef industry. Contributors to this theme are Gary Brester, John Marsh, Joseph Atwood, John Anderson, Wendy Umberger, Ernie Davis, Dan Hanselka, David Anderson, and Oral Capps, Jr., respectively. We also wish to recognize the following reviewers whose comments greatly improved the content and readability of each of the papers: Dillon M. Feuz, Chris Bastian, Janet Perry, Clem Ward, Ted Schroeder, and John VanSickle. Any remaining omissions or errors are the sole responsibility of the contributors and editors.



Who Will Bear the Costs of Country-of-Origin Labeling?

Gary W. Brester, John M. Marsh, and Joseph Atwood

Several studies have attempted to quantify the expected costs of COOL (Davis, 2003; Hayes & Meyer, 2003). Annual cost estimates for the beef industry range from \$200 million to \$6.4 billion and from \$20 million to \$1 billion for the pork industry. Proponents of COOL argue that most of the larger cost estimates are overstated. They also emphasize results of experimental auctions and surveys that suggest some consumers may be willing to pay a premium for beef that has been labeled by country-of-origin. Conversely, others argue that although some consumers may be willing to pay for country-of-origin labeling, they may not have to pay for any of it, given that the majority of beef and pork products are of domestic origin (Plain & Grimes, 2003). Thus, imported meat products could sell at a discount rather than domestic products commanding a premium. In addition, the US Department of Agriculture (AMS, 2003) found “little evidence that consumers are willing to pay a price premium for country-of-origin labeling” (p. 50) and that “estimated benefits associated with this rule are likely to be negligible” (p. 49).

Meat suppliers, retailers, and restaurants can voluntarily choose to label meat products by country of origin. Because such activity currently occurs only on a small scale, one might argue that market evidence indicates the costs of country-of-origin labeling exceed the benefits. However, one also could argue that voluntary country-of-origin labeling does not occur because benefits and costs of labeling may accrue at different levels in the marketing channel. Furthermore, if consumers do not trust the accuracy of voluntary labels, then adverse selection occurs as a result of asymmetric information. Thus, country-of-origin labeling benefits may only accrue if labeling is mandatory. In the beef and pork industries, market forces cause increases in marketing and processing costs to be distributed across market levels. Thus, the incidence of COOL costs depends primarily on relative demand and supply

elasticities at each level of the marketing chain. Furthermore, changes in the well-being of producers and consumers are best estimated by considering changes in producer and consumer surplus.

This article reports estimates of short- and long-run changes in market prices and quantities of meat and livestock in the beef, pork, and poultry sectors that would result from the implementation of COOL. We develop a type of economic model that incorporates estimated COOL costs, accounts for interrelationships along the marketing chain for each meat sector, and allows for substitutability among meat products at the consumer level. The model is used to simulate price and quantity adjustments to COOL cost shocks and the impact of potential demand increases that might be induced by COOL. In addition, we estimate cumulative changes in producer welfare at each level of the marketing chain and consumer welfare at the retail level to determine the effects of COOL on consumers and livestock and meat producers.

Evolution of Country-Of-Origin Labeling

Country-of-origin labeling is mandated for most products imported by the United States under section 304 of the 1930 Tariff Act. However, several agricultural products, including livestock (but not processed livestock products) and several “natural” products (e.g., some fruits, nuts, and vegetables) are included on a “J” list of commodities exempt from existing US country-of-origin labeling requirements. Country-of-origin exempt products are generally combined with similar domestic products during processing and marketing (e.g., domestic and imported beef carcasses). For nonexempt products, current country-of-origin labeling legislation requires listing the source (country) of imported products through the marketing system until purchased by a final consumer.

The 2002 Food Security and Rural Investment Act added a new subtitle (Subtitle D—Country of Origin Labeling) to the Agricultural Marketing Act of 1946. The subtitle mandated voluntary COOL on September 30, 2002 and mandatory COOL by September 30, 2004. Unprocessed fresh, frozen, and ground beef and pork will be required to be labeled by country of origin, but poultry products, delicatessen food items, processed foods, restaurants, food services, and small retailers (those with less than \$230,000 of annual sales) will remain exempt. Recently, Congress approved a two-year delay for COOL implementation.

Background on US Meat and Livestock Imports

The United States imports feeder cattle from Mexico (which are subsequently finished in US feedlots), trimmings and ground beef from Australia and New Zealand, and a mix of high-value muscle cuts, manufacturing/trimming beef, fed and cull slaughter cattle, and cattle carcasses from Canada. Over 75% of slaughter cattle imports have been grain-fed. Imported beef is inspected and must meet food safety standards equivalent to that for domestically-produced beef products. Beef imported as live fed cattle or as carcasses is eligible for US Department of Agriculture quality grades. In 2002, beef imports from all sources represented 16.9% of total US beef supplies. In 2002, 51% of all beef imports were trimming and manufacturing grade beef which is subsequently ground into hamburger. Live cattle imports (on a carcass weight basis) from Canada represented approximately 28% of US beef imports in 2002.

In 2002, the United States imported approximately 1.1 billion pounds of pork, which represented about 5.2% of total US pork supplies. Over 80% of these imports originated in Canada. In addition, the United States imported 5.7 million head of hogs and feeder pigs, which represents about 5.7% of US hog slaughter. Almost all hog imports originated in Canada.

The US poultry industry is the world's largest producer and exporter of poultry meat. In 2002, US poultry meat (broilers, other chicken, and turkey) exports were about 14.5% of domestic poultry supplies. In 2002, imports amounted to 16 million pounds, or less than 0.5% of domestic production. US consumption of poultry meat (broilers, other chicken, and turkey) is considerably higher than either beef or pork consumption, but less than total red meat consumption. However, the United States imports only small amounts of poultry products.

Modeling Strategy

An economic displacement model was developed assuming that COOL imposes additional marketing costs on suppliers at each market level (for a complete discussion of the model, see Brester, Marsh, & Atwood, 2004). The model is based on supply and demand relationships in the beef, pork, and poultry industries using actual quantities produced and supply and demand elasticities. These costs are generated by increased commodity segregation, record keeping, verification, labeling, and certification. The beef marketing chain consists of four distinct sectors: retail (consumer), wholesale (processor), slaughter (cattle feeding), and farm (feeder cattle). The pork marketing chain is more integrated than the

beef sector; therefore, we consider demand and supply relations for only three sectors: retail, wholesale, and slaughter (hog feeding). The poultry sector is highly integrated so only the retail and wholesale sectors are considered.

Estimates of COOL Costs

The costs of COOL costs at each level of the beef and pork industries were obtained from Sparks Companies (2003). Although these estimates are smaller than those suggested by Davis (2003) and larger than those suggested by Vansickle et al. (2003), they are similar to recent USDA estimates. Sparks Companies estimate that COOL will result in a \$1.653 billion annual increase in operating costs to the beef industry. Furthermore, they estimate that these cost increases would be distributed as \$805 million to the retail sector, \$500 million to the packer (wholesale) sector, \$150 million to the feedlot (fed cattle) sector, and \$198 million to the cow/calf (feeder cattle) sector. Using 2002 average prices and quantities for each market level, these costs estimates represent the following percentage increases in costs relative to total value: 1.24% at the retail level, 1.71% at the wholesale level, 0.50% at the fed cattle level, and 0.96% at the feeder cattle level.

Sparks Companies estimate that COOL will generate \$713 million of additional costs for the pork industry, with \$263 million occurring at the retail level, \$350 million at the wholesale level, and \$100 million at the hog finishing level. Based on 2002 average prices and quantities, these cost increases represent the following percentage increases relative to total value at each level: 0.66% at the retail level, 3.41% at the wholesale level, and 1.08% at the hog fin-

ishing level. These percentage increases generate vertical shifts of their respective supply functions. Currently, poultry is exempt from COOL legislation. Therefore, we assume that no additional costs are incurred by the poultry industry as a result of COOL.

Simulation Results

Price and Quantity Effects of COOL Assuming No Change in Consumer Demand

We initially simulate short- and long-run impacts of the above percentage cost changes assuming that COOL has no effects on consumer demand for beef and pork. Beef, pork, and poultry prices increase at the retail and wholesale levels, and feeder cattle prices increase at the farm level, but all beef and pork quantities decline. These results are theoretically consistent, because additional marketing costs increase farm-retail price spreads. Poultry prices and quantities increase because poultry demand increases as consumers substitute away from relatively more expensive beef and pork products.

Economic studies often include impacts stated in terms of economic welfare or producer and consumer surplus. Consumer surplus simply means the benefits consumers get from a product over what they paid for it. Similarly, producer surplus is the revenue producers receive over their production costs.

In the absence of demand increases, producer surplus declines at all levels of the beef and pork industries; beef and pork producers are clearly worse off, economically, without a demand increase to pay for the costs of compliance. Increased poultry demand generates increases in producer surplus at every level of the poultry industry. Across all meat

sectors, retail level consumer surplus declines.

It is appropriate to consider *cumulative* changes in producer surplus as an industry adjusts from a short-run to a long-run equilibrium. To simulate these cumulative effects, we assume that it takes 10 years (the average length of a cattle cycle) to adjust from the short run to the long run in the meat industry. We report the present value of these changes in producer and consumer surplus assuming a 5% discount rate. Over the 10-year adjustment period, producer surplus declines at every market level of the beef and pork industries. In addition, retail level consumer surplus declines in both the beef and pork industries. Although the poultry industry gains producer surplus and retail-level consumer surplus, the entire meat industry loses producer surplus and retail-level consumer surplus if COOL does not increase consumer demand for beef and pork.

Price and Quantity Effects of COOL Resulting From Changes in Consumer Demand

A second simulation was conducted to determine the COOL-induced beef and pork demand increases required so that farm-level cattle and hog producers do not lose cumulative (present value) producer surplus over the 10-year adjustment period. The model predicts that one-time permanent increases of 4.05% in beef demand and 4.45% in pork demand would be necessary for the present value of gains and losses in the feeder cattle and hog production sectors to be zero. Most livestock prices increase in the short run, and all prices and quantities increase in the long run.

A Discussion of the Simulation Results

The above simulation results are contingent upon our selection of COOL costs for each market level of the beef and pork industries. Overall, the price, quantity, and producer surplus changes in the livestock industries are relatively small; however, COOL-induced marketing costs also are small relative to revenues generated at each market level. Furthermore, if actual COOL costs are smaller or larger than those used in this simulation, the estimates of price, quantity, and producer and consumer surplus changes will be proportionally smaller or larger. The critical point of our research is that livestock producers lose producer surplus if the implementation of COOL fails to increase consumer demand for domestically-produced beef and pork products. If one-time permanent demand increases do occur, they need to exceed 4.05% for beef and 4.45% for pork if the lowest levels of the beef and pork production sectors (feeder cattle and hog producers) are to be no worse off in the long run.

It should be noted that COOL applies only to beef and pork muscle cuts and ground products sold through grocery stores. Approximately 52% of beef volume is sold through retail outlets. Therefore, an industry-wide 4.05% increase in beef demand would have to be generated by approximately one half of the beef market.

Concluding Comments

If COOL-induced demand increases do not occur, then all sectors of the beef and pork industries lose producer surplus. In addition, retail beef and pork consumers lose consumer surplus. To determine the ultimate effects of COOL on producer and

retail level consumer surplus, the discounted present value of cumulative effects of producer and consumer surplus gains and losses should be calculated over a sufficiently long period to allow for gradual change in livestock and meat supplies. Retail beef and pork demand would have to experience one-time permanent increases of 4.05% and 4.45%, respectively, if feeder cattle and hog producers were to be no worse off than before COOL. Because COOL applies only to beef and pork muscle cuts and ground products sold through retail outlets, this sector of the beef and pork industries must generate the entire demand increase. These results are, of course, specific to our assumptions regarding the size and distribution of marketing costs resulting from the implementation of COOL.

The poultry industry is the only unequivocal winner of the implementation of COOL. We assumed that the poultry industry's cost structure was unaffected by COOL because poultry is currently excluded from COOL legislation. Consequently, increased COOL marketing costs in the beef and pork sectors that increase retail beef and pork prices encourage consumers to substitute towards poultry products. This demand increase causes subsequent increases in poultry prices, quantities, and producer and consumer surplus in the poultry industry.

COOL is receiving a chilly reception by some market participants primarily because of the uncertainty regarding potential increases in demand and costs resulting from the legislation. It is interesting to note that the most vocal proponents of COOL have been groups primarily representing feeder cattle producers. The strong support of COOL provided by some feeder cattle producers indicates that those producers expect COOL-induced beef demand increases to more than offset additional marketing costs. They may be unaware that the incidence of both COOL costs and benefits will largely be determined by relative supply and demand elasticities among meat industries and market levels.

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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

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Will Consumers Pay a Premium for Country-of-Origin Labeled Meat?

Wendy J. Umberger

Proponents of mandatory country-of-origin labeling (COOL) of meat argue that COOL would provide US producers with a competitive advantage in the marketplace. They contend that US consumers perceive domestic meat products to be higher quality than imported meat products. Therefore, because of its higher perceived quality, U.S.-labeled meat will garner a premium over imported meat. Advocates of mandatory COOL draw on the results of several recent academic studies to attest that US consumers support and are willing to pay for certified US products. Are the COOL advocates' assumptions regarding the higher perceived quality of US meat and subsequent premiums justified?

Is there Evidence to Support Premiums for Country-of-Origin Labeling of Meat?

Recent studies of US consumers and meat marketers have sought to determine if support exists for a mandatory country-of-origin labeling program for meat sold in the United States. In general, the studies find support for a mandatory country-of-origin labeling program and potential premiums for "Certified U.S." meat products. For example, 93% of Louisiana consumers surveyed supported mandatory COOL of fresh and frozen beef (Schupp & Gillespie, 2001a). The majority of Louisiana meat handlers surveyed also favored a mandatory COOL program; they were particularly supportive if they believed their customers would find the label valuable (Schupp & Gillespie, 2001b).

Three separate studies explore whether US consumers would value COOL by assessing whether consumers would be willing to pay a premium for "Certified U.S." meat. The first willingness-to-pay (WTP) study surveyed 243 Colorado consumers at supermarkets during spring 2002. Colorado consumers indicated that they were willing to pay an average of 38% and 58% more to obtain "Certified U.S." steak and hamburger, respectively

(Loureiro & Umberger, 2003). Additionally, the same set of Colorado consumers were asked to indicate their support for a mandatory COOL program, provided it would cost their household a specified amount. Consumers were willing to pay an average of \$184 per household for a mandatory COOL program.

The second WTP study on COOL, conducted in Chicago and Denver during summer 2002, used survey procedures and experimental auction methods to determine premiums for COOL (Umberger et al., 2003). In this study, 73% of the consumers surveyed indicated they would be willing to pay average premiums of 11% and 24% for COOL of steak and hamburger, respectively. However, after participating in an experimental auction, only 69% of the same consumers were willing to pay an average premium of 19% for a "U.S.A. Guaranteed" steak over an unlabeled, generic steak. Consumers expressed the following reasons for preferring US guaranteed beef over imported beef: food safety concerns regarding imported meat, a fear of meat from specific countries that had outbreaks of Bovine Spongiform Encephalopathy (BSE, or Mad Cow Disease), a preference for the general information provided by the label, a desire to support US producers, and a belief that the quality of meat from specific countries was better.

The third and most expansive WTP study was conducted in spring 2003 and surveyed households throughout the continental United States via mail. The contingent valuation methods employed in this study were similar to those of Loureiro and Umberger (2003); however, premiums for "Certified U.S." labeling of three different meat products were compared: beef steaks, pork chops, and chicken breasts. The continental US consumers surveyed were only willing to pay average premiums of 2.5–2.9% over the original market price to obtain "Certified U.S." chicken breasts, pork chops, and ribeye steaks (Loureiro & Umberger, in press).

Would These Premiums Actually Exist at the Supermarket?

As mentioned previously, some proponents of COOL interpret the results of these WTP studies to be evidence that premiums would exist at the supermarket for US meat products. Before reaching that conclusion, a number of other factors must be considered. All of the WTP studies utilized common contingent valuation or experimental auction methods, which have been shown to be very useful for determining values for both nonmarket and market goods. However, as with any contingent valuation or experimental research, the results obtained from these studies are estimates of potential values and are dependent upon both the methods used (research design) and the sample of the population studied. The potential for differences in WTP estimates due to elicitation method used is evident by the wide distribution of premiums across studies. The size of premiums for "Certified U.S." or "Guaranteed U.S." meat products decrease as a larger sample of the population is surveyed. The premiums elicited from the more expansive Chicago and Denver sample (Umberger et al., 2003) and the continental US sample (Loureiro & Umberger, in press) are much lower than the premiums obtained from the regional Colorado study (Loureiro & Umberger, 2003).

It is also important to note that the labels and certification methods used to elicit WTP values in the studies mentioned above are likely different than those that would be used in the mandatory COOL program. The WTP studies essentially compare a US product to an unlabeled or generic beef product. The 2002 Farm Bill's COOL provision explicitly states that only animals born, raised, and slaughtered or pro-

cessed in the United States can qualify for a US country-of-origin label (USDA AMS 2002). Under the current AMS COOL guidelines (released in October 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 feeder calves imported into the United States from a country such as Mexico and finished in a US feedlot, would be labeled as "From Animals Born in Mexico, Raised and Processed in the U.S.A." (USDA AMS 2003).

Therefore, under a mandatory COOL program, all fresh meat products sold at a supermarket would carry some kind of country-of-origin label. At the retail level, US beef products could potentially be marketed next to beef products from countries such as Canada, Australia, New Zealand, Mexico, and South American countries. How would the perceived quality of US meat compare to meat imported from other countries? Would consumers choose a US product over an imported one? In order to answer this question, it is important to understand the factors influencing the perceived quality of meat.

What Determines Consumers' Perceptions of Meat Quality?

Quality is a rather ambiguous term, meaning different things to different people depending upon their prefer-

ences for the various attributes of a product. Consumers tend to use multiple attributes to evaluate the quality of, and subsequently determine their preference for, one food product over another. When evaluating food product quality, consumers use both *intrinsic* and *extrinsic* quality cues. Intrinsic cues are attributes inherent to the product that cannot be changed without changing the physical properties of the product. Extrinsic cues are attributes only related to the physical product. Product attributes are typically further categorized as *search*, *experience*, or *credence* attributes. Search attributes are quality attributes that can be evaluated by the consumer at the point of purchase and prior to consumption. For meat products, color, leanness, and marbling (intramuscular fat) are intrinsic search characteristics. Examples of extrinsic search characteristics include brand name, price, and country of origin (Grunert).

Experience attributes are observable during or following consumption and include the eating quality (texture, juiciness, flavor, and smell) of a meat product as well as food safety (e.g., whether there is an adverse effect immediately following consumption). Credence attributes are quality attributes that the consumer may value but cannot discern when purchasing a product or even after normal use. Process and production attributes, such as country of origin, organic, animal welfare, environmentally friendly, and free-range, are examples of credence attributes. Credible and auditable labeling systems are necessary for verification of credence attributes.

Research on consumers' perceived meat quality suggests that consumers use a multitude of intrinsic and extrinsic search attributes as well as experience and credence attributes

to determine the quality of a product. The relative importance of different types of attributes to consumers differs depending on sociodemographic characteristics and the location of consumers. For example, various segments of the population prefer and are willing to pay more for COOL than others, and the importance of country of origin in a consumer's assessment of perceived value has been shown to differ depending upon the particular country where the study was conducted (Davidson, Schroder, & Bower; Grunert).

Therefore, given the multitude of factors which consumers may use to assess a product's quality, the premiums for COOL and "Certified U.S." meat over unbranded products may be inflated, because consumers were specifically asked to focus only on the country-of-origin attribute rather than on other meat quality attributes, which may be equally (or more) important to consumers. For example, in the contingent valuation studies, consumers were not able to use other extrinsic cues (such as price, brand, and USDA grade) or any intrinsic cues (such as color or marbling) to determine the value of the products.

In evaluating the ability of the premiums elicited in the WTP studies to be good predictors of premiums that might be obtained in the actual marketplace, one should also consider the importance of country of origin and source assurance relative to other experience and search attributes. In each of the three consumer WTP studies, consumers were asked to rate, in terms of importance in their meat purchasing decision, a series of meat product attributes commonly used as meat quality cues. Food safety inspection and freshness were rated as the two most important beef quality attributes in all three

studies. Other attributes, such as leanness, color, tenderness assurance, quality grade, and price, generally received higher average ratings than country of origin or source assurance (Loureiro & Umberger, 2003, in press; Umberger et al., 2003).

The results of the aggregate attribute rankings indicate that although some consumers indicate they are willing to pay a premium for the source assurance provided by country-of-origin labels, the premiums would only exist if US beef were perceived to be safer and of higher quality (in terms of non-safety-related meat quality attributes) than beef from other countries. According to the results of a national survey, 80% of the 819 US consumers surveyed believed that food produced or raised in the United States is fresher and safer than food imported from global food sources (Wimberley et al.). Results from the continental US consumer study conducted by Loureiro and Umberger (in press) also indicate that US meat is perceived to be the safest relative to meat from Argentina, Australia, Canada, Denmark, Mexico, and New Zealand. Nonetheless, meat from Canada, Australia, and New Zealand still received an average rating of "safe," but meat produced in Mexico and Argentina was not rated as safe.¹

In terms of other quality attributes, US meat initially may be perceived to be of higher quality than imported meat. However, some consumers may actually prefer meat from other countries, particularly after experiencing it and being provided with additional labeling information on specific process- and production-related credence attributes. Consider, for example, a beef product labeled as "Certified US corn-fed beef" marketed next to a product labeled as "Certified Australia-

lian grass-fed beef." If given the choice, what product would consumers prefer and which one would they potentially pay a premium for?

In blind taste tests, 23%, 17%, and 34% of consumers studied preferred the flavor of, and were willing to pay a premium for, Argentine, Australian, and Canadian beef, respectively, relative to US beef (Umberger et al., 2002; Sitz et al.). The Australian and Argentine beef products used in the taste panel studies were from grass-fed cattle. Most of the beef imported into the United States from these countries is grass-fed, whereas US beef is typically corn-fed. In addition to the flavor attribute, some consumers perceive grass-fed beef to be of higher quality in terms of nutritional content. Consequently, if US consumers view Australian beef to be comparable to US beef in terms of food safety, then consumers who prefer the perceived nutritional benefits and/or taste attributes of grass-fed beef relative to corn-fed beef may consider a US beef product to be lower quality than the Australian product. If they also now have the opportunity at the supermarket to choose between a US beef product and an Australian product,

1. *It is important to note that these surveys were conducted prior to the December 23, 2003 case of BSE (Mad Cow Disease) in Washington State. A separate survey of 1,001 US consumers conducted in January 2004 determined that 85% of those surveyed were knowledgeable of the December BSE case; however, the majority of the knowledgeable consumers indicated that their confidence in the US beef supply remained unchanged (Hallman, Schilling, & Turvey).*

then consumers who find the Australian beef to be of superior quality may actually discount the US product.

Premiums Under a Voluntary vs. a Mandatory COOL Program

A final aspect of a mandatory COOL program that must be considered when determining if retail premiums exist for U.S.-labeled meat products is the market share of US meat products relative to the share of imported meat products. Although the results of the WTP studies suggest a potential premium for U.S.-labeled meat products over unlabeled meat, the premium only exists at the retail level if the quantity of U.S.-labeled meat supplied is less than the quantity demanded. Given the current production capabilities of US producers, the supply of "Certified U.S." meat under a mandatory COOL program would exceed the quantity demanded, and there would be no premiums for "Certified U.S." meat products at the retail level. For instance, in the case of COOL of beef, about 89% of the supply of US beef steaks and roasts would qualify to be labeled as a product of the United States (Plain & Grimes). Therefore, if only 69% of the consumers were willing to pay a premium for US beef (as indicated by Umberger et al., 2003), premiums for US beef would not exist.

Conversely, under a voluntary program, not all retail meat would be labeled with country-of-origin information, and marketers of meat products would be more likely to receive a premium for "Certified U.S." products over a product with no country-of-origin label. We do not mean to imply that under a voluntary program a premium would exist for "Certified U.S." meat, or that all con-

sumers would pay a premium for "Certified U.S." meat products. In the WTP studies discussed previously, not all consumers were willing to pay a premium for COOL. However, there were identifiable segments of consumers that indicated they would be more likely to be willing to pay a premium for "Certified U.S." products. These consumers represent target markets where premiums might exist for "Certified U.S." meat products (Loureiro & Umberger, 2003, in press; Umberger et al., 2003).

An additional and related concern is consumers' interpretation of the COOL program. It appears that a number of the consumers who preferred COOL in the consumer studies interpreted the program to provide them with additional food safety assurances and enough traceability information to allow a meat product to be completely traced back to the farm of origin. Based on how the provision was written in the 2002 Farm Bill, a mandatory COOL program is no more than a food-labeling program and would only allow identification of a meat product's country of origin by stage of production. On the other hand, the guidelines for a voluntary program could specify complete traceback and possibly other credence attributes, further increasing consumers' quality perceptions and possibly creating actual market premiums. Voluntary COOL marketing strategies would only be successful if the labeled product met the consumers' expectations of higher quality and safer meat. Thus, for COOL to be a viable marketing strategy, US meat suppliers would have to continually work to maintain consumers' safety and quality perceptions.

Will consumers pay a premium for COOL meat? Research results

indicate that although some consumers indicate they are willing to pay a premium for the source assurance provided by country-of-origin labels, the premiums would only exist if US beef was perceived to be safer and of higher quality (in terms of non-safety-related meat quality attributes) than beef from other countries. So, it remains unclear whether or not premiums would exist for COOL.

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Potential Impact of Country-of-Origin Labeling on Beef Industry Structure

John D. Anderson and Darren Hudson

Nothing about COOL has been particularly simple. In fact, COOL provisions represented one of the most vigorously debated elements of the 2002 Farm Bill. Nowhere was the debate over COOL more contentious than within the beef industry.

Among beef industry participants at all levels, arguments over COOL scarcely abated (and probably intensified) after the Farm Bill was passed. Predictably, much of the debate over COOL focused on how much it would cost (and who would have to pay for it). Estimating the costs of COOL became a virtual cottage industry—with estimates varying dramatically depending on assumptions related primarily to record keeping and traceability requirements. A good deal of debate also centered on the potential benefits of COOL in terms of increased consumer demand for beef. Here, as with cost estimates, it was very difficult to arrive at a consensus. In early 2004, due at least in part to the ongoing debate related to COOL costs and benefits, Congress added an amendment to the 2004 Appropriation Act that delayed mandatory COOL for an additional two years on all covered products except for fish and shellfish (for which mandatory COOL took effect as scheduled on September 30, 2004).

The beef industry's focus on COOL costs is understandable. The industry currently is ill equipped to provide the level of traceability that the USDA has consistently indicated the labeling program will require. Sorting out how much it will cost to make compliance possible is very important. But it is also somewhat surprising that an industry which has in the past seemed almost preoccupied with structural issues (e.g., packer concentration and captive supplies) has virtually ignored the potential market structure implications of COOL legislation.

One vital element of the COOL legislation (as it is currently written) is that retailers are responsible not only for making sure covered products are labeled, but also for

documenting that labels are accurate. This situation means that information on country of origin will have to be communicated clearly along the supply chain. In the beef industry, where the supply chain is rather long and complex, with ownership of cattle often changing several times along the way, this task may be a real challenge. One logical way to deal with that challenge is through contracting, or perhaps other forms of coordination.

In this article, we discuss how country-of-origin labeling is likely to affect vertical coordination/vertical integration strategies in the beef industry. In so doing, we seek not only to inform the debate over COOL, but also to place COOL within the larger context of industrial organization issues that have been the focus of much scrutiny in the beef industry over the past twenty years. Considering COOL in this larger context may lead to a different policy outcome than from a myopic focus on the costs and/or benefits of this (or any other) individual program.

Vertical Coordination in the Cattle Industry

The issue of vertical coordination in the cattle industry has been the subject of intense debate for many years. The primary focus of this debate has been on the use of market power and “captive supplies” and their effect on cash market prices. The USDA Grain Inspection, Packers and Stockyards Administration (GIPSA) defines *captive supplies* as any cattle that are under the control of the ultimate buyer fourteen days or more prior to slaughter. The three main categories of captive supply are packer-fed cattle, cattle purchased through forward contracts, and cattle purchased under marketing agreements.¹

Figure 1 reports GIPSA captive supply data from 1999 to 2002 (the latest year reported). Over that period of time, captive supplies increased from 32.4% to 44.4% of total steer and heifer slaughter.² Virtually all of that increase occurred through the use of marketing agree-

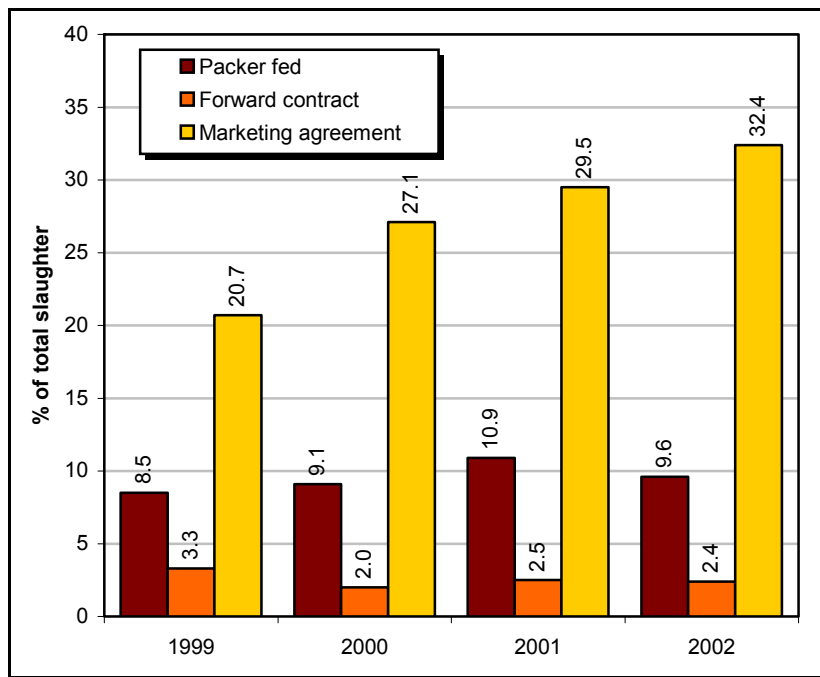


Figure 1. Packer feeding and forward purchases as a percentage of total steer and heifer slaughter—four largest packers.

Note. From USDA Grain Inspection Packers and Stockyards Administration. (2004). *Packers and Stockyards Statistical Report: 2002 Reporting Year* (GIPSA SR-04-1). Washington DC: USDA.

ments. These arrangements tend to be longer-run, standing agreements. They often give feeders considerable influence over the timing of cattle delivery. Such agreements also often involve the use of individual (or grid) pricing of cattle. In many cases, the packer provides information on the carcass merits of the cattle back to the feeder for use in future management decisions.

1. *Marketing agreements establish an ongoing relationship between the buyer and seller of cattle, in contrast to forward contracts, which generally apply only to a single transaction. Marketing agreements typically specify the number of cattle to be delivered per time period and the means by which cattle will be priced (often through a pricing formula).*

The inability of the price system to efficiently convey information along the supply chain often has been cited as contributing to the substantial decline in beef demand throughout the 1980s. Although marketing agreements and forward contracting clearly provide a logical means of dealing with this perceived problem, the practice has been controversial. This controversy stems from concern

2. *GIPSA data on packer feeding go back as far as 1954. GIPSA began collecting data on forward contract and market agreement purchases in 1988; however, prior to 1999, GIPSA reported unaudited data as reported by packers. Since 1999, GIPSA has audited the data it reports. For this reason, it is difficult to compare current data on captive supplies to that reported prior to 1999.*

that packers may be able to use captive supplies strategically to depress prices. In 1996, GIPSA concluded a multiyear, congressionally mandated study of this issue. Results were somewhat mixed, showing a negative (but small) relationship between captive supply cattle as a percent of total cattle purchases and transaction price.

More recently, the controversy over captive supplies has been taken to Congress and the courts. The Senate version of the 2002 Farm Bill included an amendment offered by Tim Johnson of South Dakota that would have banned “packer control” of cattle prior to slaughter.³ The Johnson amendment did not make it into the final version of the Farm Bill, but debate over the provision was intense.

In the courts, in early 2004, an Alabama jury issued a \$1.28 billion judgment against Tyson Fresh Meats in a lawsuit brought by a group of cattle producers. The suit alleged that IBP (subsequently purchased by Tyson Foods, Inc.) had used captive supplies to depress cattle prices in the spot market. A judge later overturned the jury’s decision, stating that there was no legally sufficient evidence to support the jury’s verdict or the size of the award. However, the issue has not been put to rest, as the producers have filed an appeal that will likely be heard in early 2005.

Although many producers vocally opposed the Johnson amendment to the 2002 Farm Bill and the position

3. *During debate over this provision, proponents of the ban held that the rather ambiguous term “packer control” referred strictly to packer ownership of cattle, not to forward contracting or marketing agreements.*

of the plaintiffs in the *Pickett vs. Tyson Fresh Meats* case, grassroots support for both of these causes has been significant—has been, in fact, a driving force. For example, an amicus brief was recently filed in support of the *Pickett* appeal. This brief was joined by more than 50 individuals and grassroots organizations, including many with a national presence such as the Ranchers-Cattlemen's Action Legal Fund, United Stockgrowers of America (R-CALF USA), the Organization for Competitive Markets (OCM), and the National Farmer's Organization. These, along with many other producer groups on record as being strongly opposed to the practice of packer feeding and contracting, are also among the most ardent supporters of mandatory COOL.

Changing the Rules Requires Changing the Structure

Given the current structural state of the industry and the visceral obsession with market structure issues, it seems ironic that the implications of COOL on the structure of the beef industry have not been a large issue in the COOL debate. Because COOL requires retailers to be able to guarantee the accuracy of their labeling, a fundamental shift in the transactions cost for retailers would be expected. In a world where “anything goes,” an open market procurement system where retailers seek out the lowest cost source of supply is sufficient to coordinate production and consumption. When one factors in supply risk and food-safety concerns, the incentives for retailers to vertically coordinate with packers and wholesalers becomes more important, leading the industry beyond its current structure.

The mandatory COOL program adds the requirement that the retailer be able to guarantee information on the source of the beef being presented to consumers. The question is: “How might one achieve this high level of information availability and integrity?” In the absence of some intervening force, the costs of researching, certifying, and *trusting* source information in an open procurement market are surely higher than if the system were vertically coordinated. If that hypothesis were true, then the impact of COOL on transactions costs would suggest that the policy creates *more* pressure for contracting in beef, not less. Grassroots organization within the beef industry that, on the one hand, argue vociferously for COOL, but, on the other, display considerable antipathy toward contracting, demonstrate that the potential linkage between COOL and contracting has not been adequately explored in this debate.

To illustrate the argument in a context that is free from the emotional baggage of COOL, consider the case of a retailer that wanted to market a product based on its location of origin because it perceived that consumers valued that information. Now, one could simply go into the market and purchase the product with little concern about the “truth” of the claims by the wholesaler. But, one could imagine the *Dateline TV* exposé on your company when they find out that you are making claims you cannot guarantee and the requisite class-action lawsuits that follow. So, what do you do? One logical solution is to bind the wholesaler in a contract which shifts the legal liability for certifying that your product does, in fact, come from where you claim it does from yourself to the wholesaler. The wholesaler, of course, wishes to shift legal liability back to

the processor, and, so on. The central point of this simple illustration is that a choice by the retailer to provide information on a product attribute as a marketing tool led to this shift in market structure. In COOL, the provision of this information is mandated.

One should recognize that there are many simultaneous forces exerting themselves on the beef market—foreign animal diseases, product branding, international sourcing and trade restrictions, to name a few—each with potentially different effects on market structure and performance. The structural impacts of COOL are just a part of the myriad of issues facing the beef industry. However, it seems clear that without some intervening force, COOL is likely to increase pressure for contracting in beef.

The Potential Intervening Force—Animal Identification

The potential impact of COOL on the use of forward contracts and marketing agreements in the cattle industry has been complicated somewhat by the related issue of animal identification. In the wake of the December 2003 discovery of a dairy cow in Washington state infected with Bovine Spongiform Encephalopathy (BSE), the USDA announced its intention to implement a comprehensive animal identification program. Although the ID program would be geared toward providing rapid animal tracking capabilities in the event of a disease outbreak, such a system could perhaps be useful in meeting the requirements of a food-labeling program like mandatory COOL.

The National Animal Identification System (NAIS), as currently proposed, would include a uniform

individual-animal numbering system. Production information would not be required; however, information on animal movement (both intra- and interstate) as well as changes in ownership would be tracked in the system. The result will ideally be a concise, easily accessible record of where an animal originated and where it has been throughout its life.

If the NAIS can feasibly be implemented as planned, the information it could provide ought to facilitate the development of a COOL program. Each animal would have a record of its origin and movement. That record would, by design, follow the animal through the supply chain. This tracking capability is consistent with the needs of the COOL (or any other labeling) program.

The NAIS will not necessarily address all of the concerns related to COOL (e.g., additional costs required for segregating product by location of origin at the wholesale and retail level); however, it does potentially represent one reasonable means of collecting and transferring the information required for the COOL program. Consequently, an effective identification system potentially reduces the incentive for contracting created by COOL. If the provenance of every steer and heifer coming out of the feedlot is readily available through the identification system, there is less reason for retailers to rely on contracting as a means of reliably and efficiently securing this information.

Although the NAIS would provide tracking capability from birth to slaughter, one should keep in mind the difficulty of maintaining identification from slaughtering through fabricating a carcass into many hun-

dreds of products. Animal tracking is one part, but keeping identification through processing is more difficult and potentially costly. Exactly how beef trimmings are to be identified is not clear. Plants or days could be identified as US only, but these structural issues certainly will affect transaction costs. Although they may satisfy COOL requirements, they may not be a traceback system.

Although a national animal identification system may reduce the cost of country-of-origin labeling, this is not to say that it will reduce total costs to the system. The higher transaction costs associated with the requirements of labeling will, in effect, become costs associated with the identification program—a program that provides additional benefits besides simply facilitating origin labeling. These costs will be the same whether animals are contracted or traded on the open market, because the requirement of the identification program will have to be met on all animals.

Summary and Conclusions

Well over two years have elapsed since passage of the COOL provisions in the 2002 Farm Bill. In that time, few if any of the more controversial aspects of the policy have been resolved, at least within the beef industry. Debate still swirls around questions such as how much the program will cost and what its potential benefits might be. At the same time, controversy continues to surround the issue of vertical integration and coordination in the beef industry. Pending court cases and the potential for additional legislation related to captive supplies will keep this issue front-and-center for the foreseeable future.

The relationship between mandatory COOL, captive supplies, and other structural changes in the beef industry (e.g., closer vertical coordination between processors and retailers) has unfortunately been virtually ignored in the lengthy debate over labeling policy. It is long past time for industry participants and policy makers to take up this discussion. Some important issues should be addressed now in order to avoid (or at least minimize) further controversy in the future.

If mandatory COOL does lead to greater vertical coordination through nonprice means (such as forward contracting and use of marketing agreements) what are the implications for the beef industry? For example, will price discovery problems associated with thin markets (already a topic of discussion in the industry) become a significant problem? More generally, will industry participants view an increase in captive supplies as an acceptable side effect of COOL, or will this simply exacerbate the current conflict, leading to additional litigation and political maneuvering? Historic precedent in the industry clearly favors the latter outcome. That being the case, industry leaders and policy makers would do well to consider what might be done now to reduce the potential for future conflicts—perhaps, for example, making changes to the provisions of mandatory COOL and/or working to more explicitly align the goals of COOL and the nascent NAIS.

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Potential Deficit Reduction Efforts and WTO Cotton Ruling Adding to Policy Uncertainty

Hal Harris and Joe Outlaw

2005 is shaping up to be an interesting year for agricultural policy in the United States. Here we are, three years into a six-year farm bill, and commodity organizations and other agricultural interest groups are starting to get itchy. Most agricultural policy observers would agree that any changes made to existing agricultural policies during 2005 will result in less support for agriculture rather than more. In recent years, when a cut or offset was needed, conservation programs were looked to first. But is that what would happen now?

Several forces are converging that are likely to create policy and therefore financial uncertainty for U.S. farmers and ranchers. Persistent rumors of impending Congressional efforts to curtail the budget deficit via budget reconciliation have many interested parties asking: "How much will the cut be, and how are they going to do it?" Obviously, the people who know the answer to these questions aren't volunteering any information. Budget reconciliation may not even happen. But at this point, there have been many comments suggesting that it is a very real possibility. Otherwise, why would several of the major commodity organizations consider hiring a former House Agricultural Committee Chair to help them try to "hold the line" on future budget cuts? Whether the threat of budget reconciliation is real or not—at this point, perception is reality.

The second force causing heartburn is the WTO ruling on the Brazilian cotton case against the United States. There are some who thought (and still think, for that matter) that the 2002 farm bill is fully compliant with U.S. WTO obligations. There are at least a few members of Congress who take exception to being forced into changing U.S. commodity programs by foreign governments. Although the cotton ruling has drawn a lot of attention from the media, it was not the slam-dunk win that initial

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reports indicated. There are some who think that the U.S. appeal will be successful, but others point to the fact that there are several examples of countries losing cases that have continued programs found to be in violation of WTO rules. Whether in the court of the WTO or of international public opinion, it will be difficult for the United States to completely ignore a loss of the appeal. And the bottom line is pretty clear—the U.S. cotton program does have an impact on world cotton prices.

The collection of papers in this edition of *Choices* is intended to cover four of the big issues in agricultural policy today. The article by Flinchbaugh and Knutson sets the stage for the Agricultural Policy Outlook for 2005 theme by reminding us how we got to this point in agricultural policy and where we are likely to go in the future.

The article by Mercier provides an excellent summary of the WTO, the U.S. role in the WTO, and reflections on the Brazilian cotton case as it may or may not influence U.S. agricultural policy in the coming years.

The third article, by Cain and Lovejoy, provides a historical perspective on U.S. conservation programs and

thoughts on the increased importance of conservation programs in the future.

In the final article, Richardson and Outlaw discuss the issues associated with cutting commodity payments to farmers. The reality is that it is not as easy as one would think,

and equity issues will almost certainly arise.

As we continue the process toward a new farm bill, *Choices* encourages readers to share ideas contributing to the interesting debate that lies ahead.

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The Agricultural Policy Outlook: Looking Back Focuses the Road Ahead

Barry Flinchbaugh and Ron Knutson

The talk on the street, in the coffee shops, and certainly among academic economists is that conventional farm programs are in big trouble. They cite:

- election results and the loss of farm program advocates (such as Congressman Stenholm and Senator Daschle) resulting in a more urban-oriented Congress;
- the WTO decision cutting down US cotton subsidies and the related Doha Round trade negotiations (see the Mercier article in this issue); and
- a renewal of restraints on farm program spending, which has not been a major factor in farm program deliberations for the past two decades (see the Richardson and Outlaw article in this issue).

Without question, these factors represent challenges to farm bill interest groups, which include more than just farmers. Adjustments in strategies, new concerted efforts, and perhaps even new programs will be required. But it is naive to consider farm programs dead or dying. This article explains why. It will do so by updating the history of farm programs, evaluating the goals of farm policy, and analyzing the politics of farm programs.

Some Farm Program History

It is often pointed out by the less than well informed that today's farm programs have their origin in the depression days of the 1930s; this gives the impression that they have not changed much since. The fact is that farm policies have evolved through three distinct periods, as follows:

Price Support Era (1930s–1960s). Farm policy began with the government overtly supporting farm prices. When market prices fell to the support level, the government purchased and stored commodities. The monuments to this policy era are the concrete grain storage silos—many of which now stand empty—across the Corn Belt and the Great Plains. In fact, government stocks became so large that

prices were generally at the support level, and production controls ranging from quotas to land retirement programs were prevalent. Because support prices were too high to be competitive in export markets, the international Food for Peace program and domestic food distribution programs were developed.

Income Support Era (1970s–1995). In the 1970s it was realized that US farmers were missing an opportunity to sell US farm products for dollars in international markets. Doing this, however, required a watershed change in farm policy from supporting farm prices to supporting farm income. The government storage bins were emptied, resulting in sharp declines and gyrations in market prices. The mechanism for supporting income involved the government setting a politically acceptable target price or loan rate and agreeing to pay the difference when the market price fell below the target price (or loan rate). During this era, farmers relied on the government-guaranteed target price (or loan rate) as a major element in their production decisions. Yet from time to time the government stepped in to control production, importantly as a means of reducing government costs. Also during this era, commodity distribution programs converted to food assistance and mushroomed to about half of the USDA's budget. In the absence of commodities in government hands and with the development of convenience foods, nutrition programs developed into predominately food stamps and cash subsidies to schools.

Market-Oriented Era (1996–present). Although the political rhetoric of the income-support era frequently made reference to more market-oriented policies, it was not until the 1996 Farm Bill that farmers were free to make decisions on what to produce based on market prices as opposed to government-determined payments. This was accom-

plished through the establishment of a system of government-determined direct payments that were not tied to either production or price. These payments were referred to as *decoupled payments* to reflect the fact that they were not tied to either price or production. Yet the system was not purely decoupled from price, because the marketing loan remained in effect, and the Congress added supplemental payments when price fell during the late 1990s. The 2002 Farm Bill amounted to a further reversion from decoupling by adding payments that were tied to price but not to production, which raised serious questions as to how committed US policy makers were to decoupled farm policies. This is one of the central decisions policy makers face in the next farm bill. That decision will be made in an international political environment that frowns on high US farm program payments that enhance farm output and reduce world market prices (see the Mercier article in this issue). However, until 1996 farmers were restrained in their ability to receive payments on crops for which they had no production history. Likewise, during this era production controls were largely eliminated, with the exception of the politically-sensitive sugar program and environmentally-sensitive Conservation Reserve Program lands. This period also introduced the concept of the government buying out the capitalized value of farm program benefits in return for making the peanut and tobacco programs more market oriented. While food assistance programs continued to grow, conservation programs were rejuvenated with a green payment environmental orientation.

Evolution of the Goals of Farm Policy

Logically, farm policy would be developed based on a specific set of goals. A review of the preambles to farm bills, where goals might be expected to be specified, suggests that this logic is seldom realized. Yet the changing substance of farm bills over time suggests a substantial evolution of policy goals, as indicated by the following:

- The social goal of saving the family farm has evolved into an economic goal of providing tools by which farm businesses can reduce risk. Implied in this change is that the government cannot save farms that do not have the scale of operation, the technology, and the level of specialization that allows them to be efficient in production and effective in marketing and management. However, limits on government payments to large farm operations can be expected to continue to be a contentious policy issue.
- The goal of adjusting production to market needs has evolved into the goal of expanding demand, remaining competitive, and achieving open markets internationally. This goal is supported by US initiatives in expanding trade agreements and negotiating for increased market access in the World Trade Organization.
- The goal of soil conservation has evolved into a goal of sustainable production in the utilization of land, air, and water. The meaning of stewardship is expanding beyond soil conservation to maintain clean air, clean water, and humane animal production systems. From a regulatory perspective, agriculture is being treated increasingly as other

industries are, but government will be there to help farmers with the transition if farm organizations are wise and flexible enough to seize upon the opportunity.

- The goal of food reserves has evolved into a goal of food security, food safety, and homeland security. New looks are being taken at how to protect the integrity of the food supply chain from farm to table in an era of globalization. The impacts of increased emphasis on food safety and security will be greatest at the farm level, domestically and internationally. This is the case because while processors and marketers are adjusting rapidly to this new goal, farmers have resisted adjustment.
- The goal of domestic demand expansion has evolved to eating wisely and in moderation. Obesity has become a major policy issue that cannot be ignored in the context of an omnibus farm policy. The potential impacts extend beyond food assistance (roughly half of the USDA's budget) and nutrition education to farm production.
- The goal of expanding the use of agriculture's production capacity for energy production needs to be officially recognized. Continued expansion of public support for industrial uses of agricultural products are a consequence of high oil prices, the need for energy security, the ability to reduce pollution from animal agriculture by capturing energy from animal waste, and new technologies for production of bio-energy.

Politics and the 2007 Farm Bill

The results of the election put agriculture in a favorable political position. The six Plains states, where farm incomes and land values are most affected by farm programs, voted decisively for the President. The political and economic importance of agriculture is understood by Secretary Johanns and the elected members of the Congress in this rural-oriented region.

Satisfying the goals of the 2007 Farm Bill does not mean less government. It does mean a different type of government and a continuing evolu-

tion of farm, food, and resource policy. Likewise, it does not necessarily mean less government payments for farmers, but a reorientation of payments to forms that facilitate adjustment to make agriculture more environmentally friendly and humane, more specialized on the commodities for which we can be competitive internationally, and more responsive to markets with less distorting effects.

Making the transition to this new policy orientation will not be easy, as was indicated by the 2002 Farm Bill and subsequent developments. If farm organizations continue to live in

the past, where they are more comfortable, their influence will decline. However, if they recognize their minority status and develop a common policy position that considers the goals and realities of the time, farm program benefits will continue to be an important feature of farm survival.

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The WTO and US Agricultural Policy: Intersections and Consequences

Stephanie Mercier

Introduction

Except during the Korean War and in 1959, US agriculture has recorded a positive trade balance on a fiscal year basis since the second year of World War II. Largely as a result of agricultural productivity growth during the 20th century, US agricultural production consistently exceeds the domestic demand for food, feed, and fiber, resulting in an increasing reliance by US agriculture on foreign markets for sales of US products. The US policy approach looks toward multilateral reform of agricultural policy under the auspices of the World Trade Organization (WTO) as a prime opportunity to achieve gains in market share.

On the other hand, US agriculture also has been the beneficiary of federal farm spending over approximately the same period, intended to support prices and/or income of American farmers, with the stated objective of maintaining a healthy rural economy. Periodically, Congress re-examines legislation that authorizes such programs, commonly known as farm bills. The current farm bill is due to expire in 2007.

Several key features of the US farm programs are regarded by trade analysts as highly distorting of trade and production due to their direct linkage to movements in commodity price and the volume of production or exports. The agricultural reform efforts in the Uruguay Round focused on reducing these types of policies. Both that round and the current negotiations to reform agricultural trade rules under the WTO have been focused on three main areas: (a) improving export competition by ending subsidization of exports, (b) improving market access by reducing tariff rates and eliminating non-tariff barriers, and (c) reducing use of the most trade-distorting forms of domestic support.¹

Consequently, US support for trade reform within the WTO, if successful, implies changes in US farm pro-

grams—a process that should come to a head in the next few years.

Background

In 1994, 125 countries signed the Final Act of the Uruguay Round in Marrakech, Morocco establishing the WTO and subsuming the General Agreement on Tariffs and Trade (GATT). The various agreements were built on GATT rules, most notably creating a legally binding dispute settlement mechanism and including agricultural trade, trade in services, and trade-related intellectual property rights issues as areas subject to multilateral reforms for the first time.

As of October 2004, there were 148 signatories to the WTO, with 25 more countries in negotiations to accede to the organization. Member countries are currently engaged in a new round of multilateral negotiations formally known as the Doha Development Agenda (DDA), with the stated objective of strengthening existing rules and continuing to reform trade policy and improve market access across the entire spectrum of trade in goods and services.

A so-called framework agreement, reached in July 2004, set consensus boundaries on how negotiations in all key areas will be undertaken, but much work and bargaining will be necessary before a final agreement can be reached. Disputes with respect to issues in agricultural trade have impeded overall progress in the round. In particular, a significant rift has opened up between developed and developing countries as to how much reform they are

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1. *Member countries are committed to cap and reduce the most trade-distorting domestic farm support programs under the Uruguay Round. These are known as amber box programs.*

willing to undertake in the three key areas of export competition, market access, and domestic support. Developing countries, under the loose coordination of the G-20 group led by Brazil, India, Argentina, and South Africa, have increasingly asserted themselves in negotiations, a role they first adopted at the failed Ministerial meetings in Cancun, Mexico in September 2003. They are seeking to force developed countries to firmly commit to significant reforms before they will agree to even consider their own reforms.

US Role in WTO Trade Negotiations

The United States was one of 23 original contracting parties to the GATT, which went into force in 1948. Eight rounds of negotiations intended to liberalize trade were initiated under the auspices of the GATT; the last round, known as the Uruguay Round (URAA) after its launch in 1986 in Punta del Este, Uruguay, culminated in the establishment of the WTO. Two of the rounds were named after officials of the US government—Douglas Dillon, Undersecretary of State in the Eisenhower Administration (and later Secretary of Treasury between 1961 and 1965), and President John F. Kennedy—indicating the prominent role taken by the United States in pushing the liberalization process over the years.

Initially, most GATT members, including the US government, insisted on keeping their agricultural sectors out of the jurisdiction of the GATT. These exemptions or exceptions were embodied in Article XVI of the original GATT agreement (amended in 1955), exempting primary products (including agriculture) from prohibitions against use of export subsidies, and Article XI,

which excepted agriculture from restrictions against use of export or import restrictions under certain conditions.

The United States did propose to include tariffs on agricultural products among reductions to be negotiated in the Dillon and Kennedy Rounds in the 1960s, but those proposals were blocked by members of the European Union (then known as the European Economic Community [EEC]), which had formed in 1957. Early in its history, the EEC was focused on developing a Common Agricultural Policy (CAP), which was intended to help European farmers produce enough food to feed all of Europe without having to rely on imports. The major policies adopted to reach this goal were high support prices, export subsidies, and correspondingly high tariffs or variable levies to prevent imported commodities from competing with domestic production. These policies, regarded as highly trade-distorting by most analysts, were in place through the 1990s, but the support price component of the CAP for most commodities is being phased out in favor of direct payments, which are increasingly decoupled from production decisions. These changes are being made to achieve greater predictability in budget costs as well from a desire to position the CAP for further WTO reforms.

In both the Uruguay Round and the Doha Round, the US government submitted initial proposals in the agricultural negotiations that were among the most far-reaching offered. Both proposals were supported by the majority of US agricultural groups as well as many members of Congress from farm states.² Under the trade promotion authority provided to the President in the Trade Act of 2002, Congress

limits itself to an up-or-down decision on legislation implementing trade agreements without being able to offer amendments; Congress does not vote on the trade agreements themselves.

Agricultural Trade Negotiations in the Doha Round

Article XX of the URAA specifically committed countries to resume agricultural negotiations one year before the end of the implementation period, in January 2000. A number of countries, including the United States, submitted proposals during the summer of 2000 intended to establish the scope of the reform that would be undertaken. A WTO Ministerial meeting held in Doha, Qatar in November 2001 affirmed countries' commitments to the overall process and established vaguely-worded objectives for agricultural reform and a timeline for completion by January 2005.

Utilizing concepts contained in the various proposals submitted by member countries in 2000 and resubmitted with minor changes in 2002, the chair of the agricultural negotiations, Stuart Harbinson, released a document for consideration in March 2003. This draft text, outlining proposed modalities or methods for proceeding to reform export competition, market access, and domestic support, was intended to forge a compromise between the more far-reaching types of reforms proposed by the United States, Aus-

2. *Groups such as the National Farmers Union and American Corn Growers did express disappointment with the US proposals to reform agriculture under the WTO in the Doha Round.*

Table 1. Key features of initial US and EU agricultural proposals in the Doha Round.

	US proposal	EU proposal
Export competition	<ul style="list-style-type: none"> •Eliminate export subsidies over a fixed period •End single-desk trading by State trading entities •Prohibit use of export taxes by state trading entities 	<ul style="list-style-type: none"> •Reduce export subsidies by 45% on outlays •Discipline use of export credits and food aid •Discipline unfair practices
Market access	<ul style="list-style-type: none"> •Harmonize tariff levels among countries, with no tariff greater than 25% •Reduce tariffs from applied rates •Increase TRQs for sensitive products •End use of special safeguard 	<ul style="list-style-type: none"> •Reduce tariffs an average of 36%, with 15% minimum •Provide duty-free, quota-free access to agricultural products from LDCs •Discipline TRQs •Keep special safeguard
Domestic support	<ul style="list-style-type: none"> •Combine amber and blue box supports,^a limit to 5% of total value 	<ul style="list-style-type: none"> •Reduce amber box AMS (aggregate measure of support) by 55% of agricultural products •Eliminate use of amber box de minimis by developed countries

Note: Summarized from proposals submitted to WTO during fall of 2002.

^aBlue box programs are deemed to be trade-distorting but mitigated by use of offsetting production-limiting mechanisms. Spending on blue box programs is not capped under the Uruguay Round.

tralia, and others, and the more modest reforms proposed by the EU and separately by Japan (Table 1). The Harbinson text was widely rejected.

During 2004, WTO member countries renewed their efforts to move agricultural trade negotiations forward and ultimately agreed in July 2004 on a framework document containing several commitments. They are summarized as follows:

- In export competition, eliminate export subsidies over an unspecified period and impose disciplines on use of export credits, food aid, and state trade enterprises.
- In domestic support, reduce spending on “amber box” programs on a tiered basis, so that member countries with the highest level of support deemed as significantly trade-distorting would reduce spending in this category the most.
- In domestic support, cap support under the “blue box” category of spending (programs deemed to be partially decoupled) to 5% of total agricultural receipts while providing for the possibility that the blue box definition would be expanded to include US counter-cyclical payments.

- In market access, reduce bound tariffs on a tiered basis, so that countries with the highest tariffs would have to cut them the most. However, countries would be given flexibility to protect their most sensitive products.

This framework document is extremely sparse on specific numbers representing concrete commitments as to the pace and extent of reform. However, if the final agreement includes significant reform of trade-distorting domestic support programs, the United States would be agreeing to modify and/or reduce its spending on price/income support programs that are currently reported to the WTO as amber box programs in order to meet its obligations. These programs include the marketing assistance loan program for crops such as wheat, feed grains, rice, cotton, and oilseeds, dairy price supports, and the sugar program. If the Doha Round is completed in the next few years, changes to these programs are likely to be incorporated in the 2007 farm bill.

However, such a deal is not a foregone conclusion, as member countries have taken very strong positions about how much they are willing to concede in this round,

especially in the agricultural talks. In a November 2004 conference in Athens, GA, American Farm Bureau Federation President Bob Stallman, leader of the country’s largest farm group, said, “If the world wants us to decrease our domestic supports, we must be met in-kind with increased market access for all farm goods. Tariffs and other barriers to trade must also be targets in the crosshairs.”

It is not clear that a final deal on agriculture that would fulfill terms such as those enunciated by Mr. Stallman can be struck based on the July 2004 framework agreement. Although the main user of export subsidies, the EU, has conceded its willingness to eliminate them over an unspecified period, developing countries in particular have balked at making significant concessions on market access. Although US farm groups do not hold veto authority over trade deals negotiated by the US government, they have direct access to the lead US negotiators as members of Congressionally-authorized advisory committees. They have also demonstrated considerable influence in the past in convincing members of Congress to vote for trade agreements they favor. Because the most recent legislation which granted the

President the authority to negotiate such agreements passed by only one vote in the House of Representatives in 2002, even modest shifts in sentiment on trade issues can have a significant impact, whether it occurs among agricultural interest groups or other groups with political influence.

WTO Dispute Resolution

Out of the new or strengthened components of the WTO as compared to the GATT, the US government was particularly pleased with the provisions of Annex 2 of the Final Act, which established a new legally binding dispute settlement understanding procedure. Previous US efforts to pursue complaints under the GATT were frustrated by the ability of either party to reject the findings of the dispute settlement panel and prevent them from taking effect. For example, in agriculture, successful cases under the GATT against the EU banana trade regime and the EU ban on hormone-treated beef were rendered moot by the lack of an effective enforcement mechanism.

Within a few years after the WTO agreements took effect, the US and other member countries filed new cases against these two EU policies and won the support of dispute settlement panels. However, it took four years for the EU to come up with a new banana regime that satisfied the other parties, and after more than seven years, the EU has yet to take action in the beef hormone case that satisfies the US and Canada, which was the other complaining party. Unlike with cases filed under the GATT, winning parties under the WTO process are permitted to retaliate against parties that fail to come into compliance with panel findings through imposition of additional tar-

iffs on selected export products sourced from that country.

Through October 2004, there have been 317 separate cases pursued under the WTO dispute settlement procedure, although not all have been followed through to establish panels. During that period, the United States filed 69 complaints under the dispute settlement process, 21 of them dealing with trade in food or agricultural products. The United States has also been the respondent in 80 other cases, 11 of these cases addressing trade in food or agricultural products. From the viewpoint of US agricultural policy, the case filed by the government of Brazil against the US cotton support programs in September 2002 was the first to call US commodity programs directly into question.

Brazil Cotton Case

Brazil's case challenged aspects of both the US domestic support system and the export programs. The core of Brazil's case with respect to US domestic support programs consisted of two main arguments. First, the level of support provided to US cotton producers between 1999 and 2002 under the 1996 and 2002 farm bills exceeded the level that guaranteed these programs immunity from challenge as illegal subsidies under previously existing trade rules. Second, if the panel agreed with the claim that US programs should be denied such protection under the so-called Peace Clause (Article XIII) of the URAA, the government of Brazil asserted that the cumulative effect of the programs caused harm to Brazil's cotton producers, which constituted a violation of the Subsidies and Countervailing Measures Agreement of the WTO, which restricts use of

subsidies that cause harm to producers in other countries.

Other key arguments of Brazil's case dealt with the US export credit guarantee program and a separate program (the Step 2 program) that provides a subsidy to cover the difference between domestic cotton prices and the world cotton price for either export transactions or sales to domestic millers. Brazil argued that both programs were operated as export subsidies; because the US government failed to report them as export subsidies in the Uruguay Round and has not limited program expenditures consistent with US reduction commitments on export subsidies, these programs should be deemed as prohibited export subsidies by the WTO dispute settlement panel. If the panel agreed with that claim, then it should require that the cotton Step 2 program be terminated by the US government, and the export credit guarantee program should be ended for those commodities not covered under the US export subsidy commitment. The portion of the case addressing export credit guarantees addressed all commodities covered by the program, not just cotton.

In a ruling released publicly in September 2004, the initial dispute panel found in favor of Brazil on most points (Table 2). The United States filed a formal appeal the following month. The Appellate Body's decision is expected in March 2005. The text of the panel's ruling on the Brazil cotton case provides little guidance as to what steps the US government should take to reform domestic support programs, if it decides to comply with the ruling by modifying the programs rather than provide compensation. It is important to note that the panel declined to support Brazil's claim that the programs included in the 2002 farm bill threat-

Table 2. Key findings of dispute settlement panel on Brazil cotton case.

Brazil's claim	Panel's finding
Peace Clause violated.	Peace clause violated because domestic support in 1999-2002 exceeded 1994 levels. This determination occurred in part because the panel deemed that fruit and vegetable planting restrictions on PFC and direct payments made them ineligible for green box status.
All US domestic support programs caused serious harm to Brazil's cotton producers in 1999-2002.	US price-related programs (marketing loan, countercyclical payments, market loss assistance, Step 2) caused serious harm to Brazil's cotton producers in 1999-2002.
Cotton Step 2 program for exporters is an export subsidy.	Cotton Step 2 program is an export subsidy.
Cotton Step 2 program for domestic millers is an illegal import substitution subsidy.	Cotton Step 2 program for domestic millers is an illegal import substitution subsidy.
Export credit guarantees are export subsidies for all commodities, not just cotton.	Export credit guarantees cannot be used for commodities not scheduled under US export subsidy commitment.
US domestic support programs threaten serious harm to Brazil's cotton producers for remainder of 2002 farm bill.	Did not support Brazil's claim, because finding involved effect of price-related programs and cotton Step 2 and export credit programs, and the latter two programs are supposed to be terminated.

ened to cause serious harm to Brazil's cotton producers in the remaining years of the legislation. The panel noted that their finding of past serious harm hinged on the combined effect of price-related supports and the cotton Step 2 and export credit guarantee programs, and thus they were unwilling to find that the serious harm would persist once the latter two programs are terminated as would be required under the panel's ruling. The government of Brazil has appealed this aspect of the case.

In addition, the panel's ruling would require the US government to eliminate the cotton Step 2 program and modify the export credit program. The panel ruled that export credit guarantees could no longer be used to assist in the export of commodities such as cotton, corn, or soybeans that were not listed by the US government as being subject to reductions under US export subsidy commitments in the Uruguay Round.³ Under the WTO rules governing prohibited subsidies, these actions would have to be taken by July 1, 2005.

US Government Response

Except when programs are found to be prohibited export subsidies, the rules under which WTO dispute set-

tlement panels operate do not normally specify how long countries are allowed to take to modify their programs or policies to come into compliance with adverse rulings. Past cases suggest that the more complex the issues involved, the longer the matter will take to resolve, especially if the country or countries filing the case are not satisfied that the programs or policies found to be WTO-incompatible have been properly fixed.

For example, although the EU ban on hormone-treated beef was judged to be improper under WTO rules in 1997, the EU has not yet removed that ban, and there is no

3. *Under the initial panel ruling, only the following products would be eligible for the export credit guarantee programs: wheat, wheat flour, barley, vegetable oil, butter, skim milk powder, cheese, beef, pork, poultry, eggs, live dairy cattle, and rice. However, the use of program for rice is likely to be restricted, because the current level of rice exports using export credit exceeds the level permitted under US export subsidy commitments made in the Uruguay Round.*

authority available under the WTO to force such an action. Instead, the EU has sought to bolster the scientific basis under which the ban was promulgated, believing such an action would allow them to maintain the ban while complying with the WTO ruling. This matter recently entered a new stage, as the EU filed for a WTO dispute settlement panel in November 2004, seeking to force the United States and Canada to drop their sanctions, since the EU asserts their regulations are now science-based and thus in compliance with the 1997 ruling.

Because the Brazil cotton case covers entirely new ground in international trade disputes, and the initial panel's report does not prescribe how compliance should be achieved, it seems conceivable that resolving this dispute could take several years, if we assume that the Appellate Body does not overturn the original ruling. One factor that will govern the length of time to reach resolution depends on how soon the government of Brazil presses the WTO to establish a deadline for action and subsequently asks for permission to impose retaliatory tariffs on US products if the US government does not meet that deadline. A second complicating factor that could extend the

length of time is if the government of Brazil is not satisfied with the actions taken by the United States to modify its programs and seeks a second case in order to test the WTO compatibility of the modified programs.

Although the Brazil case was entirely focused on support for US cotton producers (except on the export credit issues), it potentially has much broader implications for US agricultural policy. The panel's finding that US domestic support programs for cotton producers were not entitled to the protection of the Peace Clause was partly based on a determination that direct payments (and Production Flexibility Payments under the 1996 farm bill) should not be classified as decoupled (or "green box") programs because of the restrictions imposed on farmers using program base acres to grow most types of fruits and vegetables. Some WTO member countries could decide to use this finding as a basis for a new dispute settlement case, which asserts that the United States has improperly reported these payments in the green box category and

thus has violated the US commitment to maintain annual amber box program spending at \$19.1 billion or less. Brazil's success in the cotton case could also lead Brazil or other countries to file additional cases against US domestic support programs, focusing on programs benefiting producers of commodities other than cotton.⁴ Such actions are far more likely to occur if agricultural negotiations in the Doha Round over the next several months are perceived to stall or fail.

Conclusions

In the next several years, the House and Senate Agriculture Committees could face the following matters:

- a possible agreement in the Doha Round of the WTO;

4. *The Peace Clause (Article XIII) has expired, so countries would not have to prove that support for a given commodity had increased since 1994, only that it caused serious harm to producers in other countries.*

- a possible direction to modify certain domestic programs to come into compliance with the appellate ruling on the Brazil cotton case;
- annual budget deficits projected in excess of \$400 billion over the next several years, if one assumes that expiring tax breaks are extended and significant numbers of US troops continue to serve in Afghanistan and Iraq; and
- expiration of the current farm bill in 2007.

The perfect storm of the combination of these legislative responsibilities and likely pressures to reduce the federal budget deficit could lead US agricultural policy in new directions. In the past, federal farm policymaking has been largely evolutionary rather than revolutionary, but in this environment, evolution could speed up dramatically.

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History and Outlook for Farm Bill Conservation Programs

Zachary Cain and Stephen Lovejoy

Over the last 70 years, the United States Congress has taken on the task of determining how federal dollars will be invested in agriculture through farm bills.¹ The focus of this paper is to determine how conservation programs have arisen and evolved and to speculate about future direction. Conservation programs have taken a variety of forms since 1933, usually as vehicles for rural investment, income support, and supply control. It was not until the mid-1980s that conservation programs were truly rooted in protecting natural resources. Several important environmental gains have been made over the last 70 years, and the future of conservation programs looks even more promising.

1930s—Depression

The Great Depression of 1929 ushered in hard times for all Americans, especially farmers. One out of four Americans resided on farms at the time; today that figure is less than one out of 50. Between 1929 and 1932 gross farm income dropped 52%. In 1933 rural incomes were 40% of urban incomes, and there was 30% unemployment in urban areas (Doering, 1997). When FDR was elected in 1933, he promised “definite efforts to raise the values of agricultural products” (Hurt, 2002). His administration, under the leadership of Secretary of Agriculture Henry A. Wallace, produced the first farm bill: the 1933 **Agricultural Adjustment Act** (PL 73-10). Wallace understood the financial crisis that faced rural Americans; the best way to get cash to rural, predominantly agricultural focused areas was via farm programs. Direct payments were not an option at this point in history; governments giving money directly to individuals would have been seen as socialistic.

1. “Farm bill” is used throughout this manuscript as a common method for referring to Acts of Congress pertaining to agricultural programs.

The Agricultural Adjustment Act began a time-honored tradition in American agriculture: the notion that it is necessary to control supply in order for farmers to receive a fair price for their goods. The act attempted to do this by setting price supports, or parity prices, to guarantee that prices did not fall below a set level. This price support was available to producers who participated in voluntary production reduction programs, such as acreage set aside. In reality, the program was hardly voluntary—those who did not participate were subject to the uncertainty of low prices on the open market. The program was financed by levying a processing tax on the commodities. This tax was often passed straight to the consumer, who ended up paying more for food and fiber products. In 1936 this tax was declared unconstitutional on the grounds that Congress had passed a tax that was beneficial to one segment of the nation—the farmer—while causing detriment to everyone else.

This setback ultimately led to the first conservation initiatives. Congress needed to infuse cash into rural areas while controlling supply to achieve higher commodity prices, ultimately in hope of reducing the dependency of the American farmer on government subsidies. **The Soil Conservation Act** of 1935 (PL 74-46) established the Soil Conservation Service and made funding available for farmers who established soil conservation practices. This mode of bringing cash to farmers had not been challenged in court, so it became the basis of economic relief in the next farm bill: the 1936 **Soil Conservation and Domestic Allotment Act** (PL 74-461). Congress entitled the bill “an Act to provide for the protection of land resources against soil erosion and for other purposes.” These other purposes were to raise the purchasing power of the American farmer. Soil conservation was a justifiable public expenditure; Americans had seen how the Dust Bowl had driven farmers out of the Great Plains. Economic and social pol-

icy analysts saw that conservation was in the public interest, and therefore the public should contribute to the farmer's costs (Helms, 2003). Soil conservation had also gained a formidable ally in "Big" Hugh Bennett, the first director of the Soil Conservation Service. Bennett used his supreme showmanship and scientific knowledge to rally Congress and the American public to the need for soil conservation.

Financial assistance for conservation in the 1936 Act was called the Agricultural Conservation Program (ACP). The ACP sought to reduce commodity surplus by paying farmers to replace seven soil-depleting crops with soil-conserving crops. The seven soil-depleting crops included corn, cotton, wheat, and other commercial crops the USDA believed to be in surplus. By planting a grass, legume, or cover crop in place of one of these soil-depleting crops, the government would pay the farmer for participating in soil-conserving practices out of the general revenue fund instead of assessing a special tax.

Although this program provided a constitutional way to get cash to farmers, it failed to reduce surpluses—surpluses actually grew. This can be attributed to farmers enrolling their poorest ground into conservation programs while using their guaranteed income via government payments to increase yields with fertilizers, machinery, and other technology on their best ground. The 1938 Agricultural Adjustment Act sought to decrease these surpluses by using acreage allotments and the development of the ever normal granary to handle excess supply, to no avail. The act did continue to build on conservation policy by increasing payments to participants and setting rules for how those payments should be divided between landowners and

producers (tenants and sharecroppers). The 1938 Act also laid the groundwork for soil conservation districts at the county level.

By providing rural Americans with conservation funding in the late 1930s, the administration was able to increase the quality of life and economic security that was shattered by the Great Depression. Table 1 provides a comparison between conservation expenditures in 1937 and 1999 in 2000 constant dollars.

1940s—Wartime

World War II brought a hungry world market to American producers. High demand led to higher prices, and the government developed great surpluses to ensure national security. Conservation was put on the back burner as producers scrambled to cash in on high prices. This was a period of turf wars, where the Soil Conservation Service, land-grant colleges, Farm Bureau, extension, the Department of the Interior, and others attempted to shape their roles in conservation programs. There developed under Bennett a sense that SCS, as the keeper of the conservation flame, had the mandate and mission to plan and execute a national program of soil and water conservation. Conservation was defined as what the SCS decided to do. After World War II, the SCS was project oriented, conducting activities like the Small Watershed Program and Great Plains Conservation Program. These were seen as public works programs that usually were funded to benefit the home district of some congressional representative (Doering, 1997).

1950s—Dealing with Surpluses

The war ended, demand shrank, and surpluses grew. Farm bills in 1949 and 1954 did little to control sur-

Table 1. Conservation expenditures.

Year	1937	1999
Financial assistance	\$5,041,700,000	\$231,383,000
Technical assistance	\$261,863,000	\$799,578,000
Land reserve	\$17,655,000	\$1,711,163,000
Total	\$5,321,218,000	\$2,742,124,000

Note. Adapted from Doering (2000).

pluses and less for conservation. The **Agricultural Act** of 1956 (PL 70-540) created the Soil Bank, which took 29 million acres out of production. By transferring these acres into conserving practices, the government could decrease surplus supply as well as deal with (as stated in the act) "the stifling effects of erosion that threatened the welfare of every American and disrupted markets and commerce on the whole." These acres were to be diverted into soil, water, forest, and wildlife conservation programs in exchange for government rental payments for 10 years.

The Soil Bank was made up of two specific programs: the acreage reserve and conservation reserve. The acreage reserve program made farmers refrain from planting surplus commodities (corn, wheat, cotton, rice, peanuts, and several varieties of tobacco) or plow down the crops they had already planted. The conservation reserve program called for a three-year contract wherein the government would pay for land improvements that increased soil, water, forestry, and wildlife quality if the farmer would agree not to harvest or graze contracted land. This act also stated that newly irrigated or drained farmland could not be used to produce these surplus commodities, as well as providing matching funds to the state for reforestation of private lands. Land retirement programs had several objectives: reduc-

ing erosion, supporting farm incomes, and reducing commodity price support payments by reducing the supply and thereby raising market prices (Helms, 2003). This period started a trend that would be followed until the early 1980s—the idea that the biggest problem with soil loss was lost productivity. Several important lessons would be learned about land retirement programs by the failures of the Soil Bank, such as limiting retirement on a per-county basis so as not to devastate local economies and the importance of a bid system rather than fixed payments. The acreage reserve ended in 1958 under criticism of its high cost and failure to reduce production (Bowers, Rasmussen, & Baker, 1984).

1960s—Targeting Surplus Commodities

Surpluses were still the norm in the 1960s, and the government continued the fight for supply control. Conservation payments through the ACP were being used for lime and drainage, which improved soil quality and increased yields. In 1962, 38% of funds were spent on fertilizer and lime. These major outlays were starting to be questioned as a driving force behind producing further surpluses. Farm productivity grew by 49% between 1950 and 1970. The **Emergency Feed Grain Act** of 1961 (PL 87-5) attempted to take additional corn and grain sorghum out of production by paying farmers to replace production acreage with conservation areas. Designed only for 1961, this program continued for several years. Subsequent acts of the 1960s redefined the set-aside acreage program, changing contract lengths and program capacities. The 1965 Act established a cropland adjust-

ment program, giving the Secretary of Agriculture authority to make 5- to 10-year contracts with producers who agreed to convert cropland into uses that would conserve water, soil, wildlife, or forest resources, establish or protect open spaces, natural beauty, or wildlife or recreational resources, or prevent air or water pollution. Payments could not exceed 40% of the value of the crop that would have been planted on that land.

1970s—Fence Row to Fence Row

The Russians were running out of food and the Secretary of Agriculture told farmers to “plant fence row to fence row” in order to produce enough crops to meet world demand. The Russian grain purchases ensured that prices and demand were high. American farmers were more than willing to answer the call to produce more. In retrospect, this attitude was very detrimental to the gains that conservation programs had made during the previous 40 years. Farmers tilled up their conservation acreage and went back to their old ways. A 1977 Congressional study found that 26% of farmers in the Great Plains Conservation Program had plowed up their newly established grasslands for wheat production after their contracts had expired (Doering, 1997). This emphasizes the difficulty of maintaining long-term conservation practices, especially in land retirement programs.

The **Agricultural Act** of 1970 (PL 91-524) offered further payments to farmers who were willing to let fishermen, hunters, and trappers onto their conservation acreage. The Water Bank of 1970 was established to protect the breeding grounds of migratory waterfowl. The **Agriculture and Consumer Protection Act**

of 1973 (PL 93-86) authorized long-term contracts (up to 25 years) for the Rural Environment Conservation Program and Water Bank Program. There was a push in conservation to increase the “natural beauty” of rural America. The language used in the **Food and Agriculture Act** of 1977 (PL 95-113) shows the USDA was starting to take a harder look at sources and solutions for point and nonpoint farm pollution, including animal wastes. The administration began looking not only at water pollution from sediment runoff but also the overall quality of water supplies in rural America. This also led to increased targeting, putting money where it was deemed most beneficial for water quality instead of in the hands of any and all farmers.

1980s—Conservation Policy that has Conservation Implications

The farm policy of the 1980s shows a change in environmental concern. Until this time, two major themes had dominated the conservation debate: first, reducing high levels of erosion; second, providing water to agriculture in quantities and qualities that enhanced production (Zinn, 2001). Increased public awareness about the deleterious effects farming had on not only soil quality, but also water, air, and wildlife, came to life. Conservation programs started to focus on conservation, not supply control or rural development. This swing in motives can be attributed to the demands of the environmental lobby, who found it was easier to make environmental changes in agriculture through farm bills than through environmental legislation (Doering, 1999). The 1985 Farm Bill was the first to have a specific title devoted to conservation. The true breakthrough of the 1985 Bill can be

found in the change in the language it uses to describe the importance of soil conservation for reasons other than productivity gains. It added new programs: Sodbuster, Swampbuster, Conservation Compliance, and the Conservation Reserve Program (CRP).

Conservation compliance set high penalties, such as loss of price-support programs, government crop insurance, FHA loans, CCC storage loans, and CRP payments, for owners of highly erodible land (HEL) that did not develop and implement a farm conservation plan before 1995. Sodbuster required complete implementation of a conservation plan before new HEL could be cultivated for the first time. Failure to comply led to loss of all farm program benefits until conservation plans were fully implemented. Swampbuster prevented conversion of wetland areas into production (Napier, 1990). These programs were actually enforced early on, causing a political uproar and turning neighbors and SCS employees into “soil cops.” The majority of funding went to putting 36.4 million acres into the CRP. The CRP was intended to conserve not only highly erosive lands (like soil banks had done in the past) but also conservation of other biologically sensitive and important areas. In essence, the public rented the land from the farmers to ensure it was taken out of production. This land was chosen using a scoring system, which was unknown to most producers. The system ranked the environmental improvements that could be made if the land were taken out of production. Congress targeted enrollment eligibility to highly erodible land and other lands that posed an off-farm environmental threat. The USDA estimates that the average erosion rate on enrolled acres was

reduced from 21 to less than 2 tons per acre per year. Even though the new CRP program was rooted in resource conservation, it was still more of the same—supply control and income support. The programs implemented by this farm bill had the potential to make great impacts in conservation, but it would take the SCS a few years to put the actual infrastructure together to make these programs a reality.

1990s—Keep Conservation Rolling

Farm bills passed during the 1990s continued the advancements in conservation that were made in 1985. 1990 witnessed the establishment of the Wetland Reserve Program (1 million acres) and the Ag Water Quality Protection Program (10 million acres). The **Food, Agriculture, Conservation, and Trade Act** of 1990 (PL 101-624) addressed ground water pollution, water quality, and sustainable agriculture, and allowed for the use of easements, as well as amending existing programs. This period also highlighted the importance of natural systems larger than individual farms: landscapes, watersheds, and ecosystems (Zinn, 2001).

The 1996 program extended CRP sign-ups and formed a new structural, vegetative, and land management conservation program EQIP (Environmental Quality Incentives Program). EQIP started with \$200 million in annual funding, half of which went to livestock producers for technical and cost-share assistance in addressing environmental improvements on their operations. The other half went into programs that EQIP consolidated: ACP, Great Plains Conservation Program, Water Quality Incentives Program, and Colorado River Basin Salinity Control Pro-

gram. The ACP, which was once the dominant conservation program, was cash starved out of existence. A new program, Wildlife Habitat Incentives Program (WHIP), was established to help induce wildlife habitat reclamation from production acreage. Conservation compliance lost its teeth through the farm lobby process; many farmers deemed it too intrusive on their activities. In 1994, the Soil Conservation Service was renamed Natural Resources Conservation Service (NRCS).

The language of the 1996 Bill began to reflect a change from “targeting the ACP program to specific practices in all counties” to targeting EQIP to “maximize environmental benefits per dollar expended” with less regard to making certain all counties participated. Programs were targeted to special “conservation priority areas,” which functioned to restrict the flow of conservation dollars away from the general farming public into areas deemed environmentally critical. This began an applicant process known as “bid down,” because landowners usually had to accept a lower-than-maximum cost-share rate to be accepted into the program in order to satisfy the program’s environmental objectives (Helms, 2003). Although focusing upon maximizing environmental benefits was an ambitious step forward, the 1996 Farm Bill was only marginally successful in altering the distribution of resources, and there was still substantial targeting of funds for reasons other than environmental efficacy.

2000s—Going Green

The 2002 **Farm Security and Rural Investment Act** (PL 107-171) continued to emphasize conservation by increasing EQIP funding from less

than \$200 million to \$1.3 billion over several years and establishing a new Conservation Security Program (CSP). Environmental enhancement now took priority over other benefits, such as productivity and supply control. The 2002 Bill also removed restrictions that limited the ability of the USDA to assist larger farmers (Lovejoy & Doering, 2002). The CSP pays producers to adopt or maintain practices that address resources of concern, such as soil, water, and wildlife. This “green payment” program openly recognized that farmers who had strived for conservation and environmental enhancement also deserved some financial assistance. The CSP is a three-tier system; higher tiers require greater conservation effort and offer greater payments. However, to date, the program is still significantly underfunded. This can be blamed partially on the funding pipeline, which is connected to the CCC instead of the general congressional funding. Lobbyists believed that by funding the CSP through the CCC, the program would not be prone to the pitfalls of budgetary reductions. However, the weather dictated otherwise, as the CCC funding quickly vanished in the form of disaster payments to producers after a string of flooding in the early part of the decade. In 2004, a total of 2,188 CSP contracts were approved (all farms that applied were accepted) covering 1,885,400 acres in 18 watersheds at a cost of \$35 million. Of the 27,300 farms in the 18 watersheds, only 8% of farms applied and received contracts, comprising 14% of the 14 million eligible acres. The NRCS has announced plans to increase from 18 to 202 watersheds in 2005, which includes about 208,000 eligible farms and ranches and more than 83 million acres of

farmland. These 202 watersheds are located in portions of all 50 states and Caribbean territories, thus greatly broadening the scope (and presumably the cost) of the CSP program.

Land retirement programs expanded by this legislation placed a particular emphasis on wetlands. CRP acreage was increased from 36.4 to 39.2 million acres, and an additional 1.2 million acres were added to the WRP. The 2002 Bill also created a Grassland Reserve Program (GRP) to assist landowners in restoring and conserving grasslands. WHIP received a tenfold funding increase over the 1996 Bill. The Farmland Protection Program, which provides funds to state, tribal, or local governments and nonprofit organizations to help purchase easements against the development of productive farmland, also received increased funding.

The Farm Security and Rural Investment Act increased funding for environmental programs by 8 times over the 1996 Farm Bill, but recent increases in defense and homeland security spending have made getting money to these programs difficult. The 2002 Bill sought to reduce targeting funds by developing a regional equity provision. This provision gives priority conservation program funding to any approved application in any state that has not received at least \$12 million in funding for the fiscal year. The “bid down” process was also removed, and least cost was no longer used in selecting from applications with similar environmental benefits. The 2002 Bill shows a fundamental change in the process of environmental spending. Congress and the USDA would no longer attempt to simply maximize the number of acres in conserving uses, but rather maximize the environmental benefits for the expended funds in

all of the conservation titles, (e.g., the maximum environmental bang for the buck; Lovejoy & Doering, 2002).

Future of Farm Bill Conservation Programs

What will conservation programs of future farm bills look like? Let's get out the crystal ball. The average forecasted outlays of the Commodity Credit Corporation, \$16.5 billion, represents about one third of total annual net cash farm income. This only signifies the importance of farm program payments to the near future of agriculture. Since we likely will not abandon farm subsidies anytime soon, we need to examine where that funding might go. Green payments, such as the CSP program, hold real potential for environmental benefit while retaining producer income support. The upside to such a policy would be increased environmental protection and reaching compliance in the World Trade Organization. The WTO does not view conservation payments (unlike other subsidies) as distorting international trade, as long as they are used to make conservation gains. The downside to such programs is the cost associated with them. In a green payment system such as the CSP, almost every producer would be entitled to payments, not just those growing specific crops. Moving to such payments could decrease productivity, essentially driving up food prices. They require more planning and input from agencies like the NRCS, costing more money and further intruding on the farmers' independence. It will be interesting to see where the tradeoffs will be made among Americans' desire for a healthy environment, low taxes, cheap food, a profitable agricultural sector, and a dynamic rural economy. In an age of

big budget deficits, it is probably safe to assume that we might not see a switch to solely green payments in the next farm bill, but rather a fight to keep the conservation payments we currently have. It is more likely that we will see a reform in the way direct payments are made to producers with continued countercyclical-type payments to buffer against the bad years. If the best indicator of future behavior is past behavior, we should not expect revolutionary changes in Congress's handling of the next farm bill, but rather continued evolutionary change of conservation policy and continued support for some level of commodity payments and disaster relief. A recent initiative by some agricultural lobbying groups suggests declining support for acreage retirement programs and increasing support for full production. The balance between the desires of these groups and the environmental concerns of other groups remains to be seen.

Conclusions

During the Great Depression the federal government began a system that invested in the rural agricultural economy to help farmers face tough times. Before this time, the USDA provided research, marketing, and extension services. Now they were attempting to provide income and crop price support to the impoverished American farmer. The mode of this funding ended up being conservation programs, and the government spent greatly, as indicated in Table 1. This program continued to evolve over the decades, changing

from a vehicle of income, price, and supply control into an environmental resource management program that only occasionally manipulates income, price, and supply. Early farm bills sought to help the producer control erosion and increase productivity of the land; later acts attempted to control the overall supply of commodities to boost prices. Since 1985, great strides have been made in conservation titles of our nation's farm bills, bringing into focus the true importance of the balance of natural ecosystems and production agriculture. We are far from finished with this task; there are still many problems of production agriculture that need to be reconciled. This will be the duty of future farm bills—to continue to provide farmers the opportunity to become better stewards of the land. The future of green payments will likely be a function of time, available dollars and congressional will.

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Implications of Budget Reconciliation for Commodity Programs

James Richardson and Joe Outlaw

There appears to be a renewed emphasis in Washington on reducing the federal budget deficit. Although the US economy is improving, it appears that the only way to make real progress in reducing the deficit is to reduce government expenditures. The desire to reduce the deficit, coupled with the President's agenda that includes several controversial and potentially costly items, has many in Washington discussing the possibility of budget reconciliation for fiscal year 2005/06 after a budget resolution is passed in 2005.

The details and intricacies of budget reconciliation are far beyond the scope of this paper. In general, however, if budget reconciliation happens, the budget committees will send instructions to authorizing committees indicating the amount of the required spending reductions relative to baseline spending. It will then be up to the authorizing committees (the agriculture committees in the case of most agricultural programs) to decide what programs are cut and by how much—as long as the required overall reduction is achieved. At this point, there is only speculation about what programs would be cut, but the agriculture committees would have a wide range of programs to choose from, including nutrition, export assistance, conservation, and commodity programs, to name a few.

Producers and their groups are having a hard time accepting the prospects of cuts in program benefits. They cite the fact that commodity program spending has been less than projected by the Congressional Budget Office (CBO) over the past few years due to higher actual prices than were projected. In their mind, this results in savings to the federal government, and they shouldn't be asked to take cuts. Unfortunately for producers, in the world of budget scoring, lower payments due to higher commodity prices do not represent budget savings.

The purpose of this paper is to discuss a few of the alternatives available to the agriculture committees for

achieving budget reductions from commodity programs. The three primary mechanisms used to provide support to covered crops produced by US farmers are the counter-cyclical payment program (CCP), the marketing loan/loan deficiency payment program (ML/LDP), and direct payments (DP). The fact that these programs are interrelated has the potential to create additional issues that should be addressed prior to implementing changes to avoid unintended consequences (Table 1).

A hypothetical example is provided assuming that a 10% reduction in March 2004 CBO baseline spending levels is required over the 2005–2014 period. To project budget savings, a stochastic simulation model was developed to imitate the CBO budget scoring process and the results of achieving savings by implementing reductions in target prices, loan rates, direct payment rates, and the payment fraction. CCPs and ML/LDPs are received when the market price is less than the program's respective trigger level. As a result, a deterministic model, which uses mean prices, fails to score reductions in target prices and loan rates as a budget saving. A stochastic model, on the other hand, simulates the full distribution of prices, so any decreases in target prices and loan rates result in budget savings. It should be noted that changes could also be made to payment limits to achieve budget savings (although this paper does not consider payment limits).

The example will discuss the consequences of (a) reducing target prices that would reduce CCPs; (b) reduc-

Table 1. Impact of a decrease in current farm policy instruments on CCPs, DPs, and ML/LDPs.

Policy tool	CCP	DP	ML/LDP
Reducing target price	Decrease	No change	No change
Reducing loan rate	Increase	No change	Decrease
Reducing direct payment rate	Increase	Decrease	No change
Reducing payment fraction	Decrease	Decrease	No change

ing the direct payment rate that would reduce DPs; (c) reducing loan rates that would reduce ML/LDPs; and (d) reducing the 0.85 payment fraction used in the calculation of DPs and CCPs—essentially lowering both of these payments.

2004 CBO Baseline

The CBO develops baseline budget projections to give Congress a baseline to measure the effects of proposed changes in law against (CBO, 2002). For agriculture, CBO projects government expenditures, by program and crop, assuming a continuation of the current farm bill for 10 years. As a point of reference, the 2004 CBO baseline, projected CCP, DP, and ML/LDP payments for the nine major program crops is about \$120.5 billion over the 2005–2014 period. Total DPs for nine crops (corn, wheat, cotton, grain sorghum, barley, oats, rice, soybeans, and peanuts) is estimated at \$49.7 billion, whereas CCPs and ML/LDPs are \$36.7 billion and \$29.1 billion, respectively. It should be pointed out that current projections of market prices over the next few years are significantly lower than were projected in the example baseline (2004 CBO March baseline). This means that the 2005 CBO baseline that will be used for measuring savings will likely have significantly greater projected CCP and ML/LDP expenditures.

For this paper, the stochastic budget scoring model was optimized using optimal control theory to estimate the decreases in target prices, loan rates, direct payment rates, or payment fraction to achieve a 10% budget savings. The model was optimized once with an across-the-board percentage change in a policy variable (e.g., target price) to achieve the budget savings. Next, the model was

optimized once for each commodity to find the percentage decrease in a policy variable (e.g., target price) to achieve a 10% budget savings for each crop.

Target Prices

Cutting target prices will reduce CCPs. Countercyclical payments are a safety-net payment triggered when season average price falls below the target price minus the direct payment rate. The CCP is paid on a historical yield (created in the 2002 Farm Bill) and base acreage, which is then reduced by the 0.85 payment fraction.

Using the 2004 CBO Agriculture baseline, it is estimated that a 4.5% cut in target prices would result in a 10% savings in government payments for the nine program crops over the 2005–2014 period. The problem with an across-the-board cut of target price is that it may not be an equitable way to achieve a budget reconciliation spending cut. The 2004 CBO baseline indicates that corn, wheat, and rice receive 30–33% of their payments from the CCP. In comparison, soybeans receive only 14% of total payments from CCPs, while peanuts and cotton receive more than half of their payments from CCPs. An across-the-board cut in target prices to achieve budget reconciliation instructions to cut spending would negatively impact soybeans, wheat, rice, and corn relatively more than cotton and peanuts. In other words, an across-the-board cut reduces the expenditures for some commodities more than others. Is this equitable?

Direct Payment Rate

Cuts to the direct payment rate would reduce DPs but increase CCPs. As the direct payment rate decreases, the CCP rate increases (in

the absence of a change in the target price). Recall that the CCP rate equals target price less the direct payment rate minus the greater of the season average price and the loan rate. As a result, cutting the direct payment rate offers only limited benefits to meeting a budget reconciliation target, because rising CCPs offset DP cuts. Based on the 2004 CBO baseline for 2005–2014, it is estimated that a 50% cut in direct payment rate only saves 3% of spending to nine program crops, and cutting direct payment rates to zero only reduces federal spending for program crops by 5% because of increases in CCPs.

Additionally, the DP is a certain payment, whereas CCPs are risky. Therefore, cutting the direct payment rate to zero to achieve a 5% budget savings reduces producers' utility. Producers would lose \$49.7 billion of certain DPs to gain access to uncertain CCPs. Another concern about cutting direct payment rates is that the DP is a decoupled payment, which was not included in the WTO cotton case brought against the United States by Brazil (see Mercier paper, in this issue).

Loan Rate

Reducing the loan rate will reduce ML/LDPs and increase CCPs (in the absence of other changes). To the extent that loan rates exceed producers' expected prices, loan rates encourage increases in supply. So, a reduction in loan rates can be expected to reduce the production over which ML/LDPs are paid. However, as the loan rate falls, the maximum CCP rate increases. Using the 2004 CBO baseline, it is estimated that a 17% cut in loan rates for the nine major program crops would reduce government payments to these crops 5%. (Note that this calcu-

lation ignores the supply response of lower loan rates.) With 17% lower loan rates, CCPs would rise about \$10 billion—more than offsetting the \$4.7 billion decline in ML/LDPs. This leads to the conclusion that cuts in loan rates are not a feasible option for reducing spending on the nine program crops.

Equity issues would also occur with cuts in the loan rate. In the 2004 CBO baseline, cotton receives only 2% of its government payments from ML/LDPs, whereas soybeans receive 53% of their payments from LDPs. Corn, wheat, and rice receive about 20% of their payments from ML/LDPs. Therefore, an across-the-board percentage cut in loan rates to meet budget reconciliation instructions to cut spending would mean soybeans would be footing most of the required budget savings for other crops (corn, wheat, rice, and cotton).

Payment Fractions

A payment fraction of 0.85 is used to reduce the DP and CCP by 15% in the 2002 Farm Bill. Cutting the payment rate fraction is a simple way to reduce government payments. Reducing the payment rate fraction from 0.85 to 0.74 would yield an estimated 10% reduction in government payments for the nine program crops over the 2005–2014 period. Producers would probably dislike this approach, because it reduces the certain DPs, and it makes some crops pay less than their share of the budget cuts. Cotton and peanuts receive about 97% and 89%, respectively, of

their government payments in the form of DPs and CCPs, whereas soybeans receive only 47% of their payments from DPs and CCPs. Rice, corn, and wheat receive roughly 80% of their government payments from DPs and CCPs, so they would not prefer cuts in the payment fraction rate. Soybean producers, however, may prefer this method of achieving a budget reconciliation reduction, because they receive a relatively smaller portion of their government payments from CCPs and DPs.

Summary

Under the 2004 CBO baseline, the projected CCP, DP, and ML/LDP program payments for the nine major crops is \$120.5 billion over the 2005–2014 period. It is anticipated that Congress will pass a budget reconciliation bill in 2005 requiring the House and Senate Agriculture Committees to comply with the budget reconciliation guidelines. The provisions of the 2002 Farm Bill make it difficult for the agriculture committees to cut payments by simply cutting target prices, loan rates, or direct payment rates.

A cut in the direct payment rate or cut in the loan rate increases CCPs. Cutting the payment fraction is the easiest tool to use, but it reduces both DPs and CCPs, making farmers worse off than simply cutting target prices and reducing an uncertain government payment.

Across-the-board cuts are easier to manage but raise significant equity

issues. Cuts in loan rates put the burden of budget savings for the whole farm bill disproportionately on commodities that benefit more from LDPs. Similarly, cuts in target prices put a greater burden on a different group of commodities. To reduce the impacts of equity issues, the agriculture committees may need to consider reducing policy variables differently for each of the commodities.

A common ground that all program commodity producers share is a preference for DPs over CCPs and LDPs. Expected utility theory suggests that decision makers prefer a certain income over a similar but uncertain income. Any policy change that reduces DPs so farmers have to rely more on LDPs and CCPs will be met with disfavor.

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Severing the Link between Farm Program Payments and Farm Production: Motivation, International Efforts, and Lessons

Clayton W. Ogg and G. Cornelis van Kooten

Decoupling Farm Payments: Experience in the United States, Canada and Europe

Historically, farm program provisions distorted agricultural production and resource use, in turn affecting agricultural prices, trading partner relationships, levels of government support, and environmental quality. Recognizing this, the United States moved to “decouple” program payments from production in 1996, but it subsequently stepped back from this position in 2002 when it reestablished program yields and base acreages in certain payment formulas.

Although the EU and Canada have less experience with decoupling mechanisms, they are pursuing different and potentially useful options. In this paper, we review experience with decoupling in the United States, Canada and Europe, attempting to glean something about options for future farm policies.

Why Might We Want to Decouple?

Price-support payments often provide incentives for farmers to increase production, which typically involves expanded use of chemicals and cropping on marginal lands. Decoupling government payments from production eliminates incentives to overproduce. Decoupling also addresses depressed regional and global prices that are the result of overproduction in the major grain-growing regions of the world. This can be important both domestically and internationally. Domestically, reducing production incentives tends to reduce supply, which raises commodity prices and lessens the need for farm income support. Internationally, decoupling enhances compliance

with World Trade Organization (WTO) rules that encourage countries either to decouple—to sever the link between income support for farmers and production—or to reduce the level of support payments, with sanctions recommended against those countries that fail to achieve progress in this regard. Finally, decoupling initiatives address the domestic environmental damage that results when price-support programs encourage greater use of pesticides and fertilizers (which are pollutants), while decreasing the damage from increased conversion of marginal lands (including wetlands and other natural areas) to cropland as well as effect other environmentally sensitive practices (tillage intensity, irrigation, etc.).

Background

Initiatives to liberalize trade in Europe and North America have included modifications of the formulas used in making payments to farmers. In 1996, the United States adjusted the yield and base acreage used in computing farmers’ payments in ways that reduced their distorting effects on input use, trade, and the environment. A yield history and fixed-base acreage had already become a feature of Canadian and European Union (EU) agricultural support payments in 1991 and 1992, respectively. But when the EU undertook their decoupling initiative in 2003/04, some member states began to modify the base acreage used in their payment formula (Kelch & Normile, 2004), in a manner reminiscent of the United States’ backtracking on decoupling in 2002.

The similarities in approach make it relatively easy to describe US, Canadian and EU decoupling options and

compare their effectiveness, although subtle differences can greatly influence their effectiveness. The stakes are high because payments that encourage farmers to produce more will undermine world prices, pressure the domestic environment, and increase the cost of everyone's farm programs.

Recent Decoupling Initiatives in the United States, Canada, and the EU

We begin with the US experience, because the United States was first to attempt complete decoupling of the links between payments and farm production processes. Further, we find that Canada and the EU pursue options similar to those in the United States, so they face similar challenges.

Decoupling in the United States.

The United States attempted to decouple payment programs in 1996 by (a) freezing the yield history used in computing farmer payments (rather than basing payments on recent cropping history), (b) allowing planting flexibility (rather than requiring farmers who choose to participate to plant within their prior base acreage for all crops), and (c) permitting farmers to cease farming while still receiving payments.

Although the first option was implemented for nearly two decades prior to 1996 without major controversy, severing the link between farming and payments (the third option) proved difficult to accomplish politically, because it went against most people's sense of fairness—producers should be paid for producing something, not for sitting idly by. As a consequence, the idea of decoupling was looked upon by some with skepticism. In 2002, the United States allowed farmers to reestablish the

payment yields and/or base acreage used in certain payment formulas.

Decoupling in Canada. Canada's agricultural programs, at least in the West, are partly driven by the Canadian Wheat Board (CWB) marketing regime that bases quotas for eligible grains on farmed area and thus encourages farmers to cultivate as much land as possible (Schmitz & Furtan, 2000). In addition, the "Crow" transportation subsidy and feed freight assistance raised farm gate prices, leading farmers to expand cropland and farm more intensively. It was not until 2000 that the effects of the Crow subsidy and feed freight assistance were eliminated. Meanwhile, there has been a move to implement programs that enable farmers to remain eligible for CWB quota while converting some lands to a long-term conservation use (such as permanent pasture).

Canada replaced existing farm programs in 1991 with the Net Income Stabilization Account (NISA), which is based on a five-year average of recent net income, and the Gross Revenue Insurance Program (GRIP), which is based on a system of base acreage and yield history, much like the pre-1985 US approach. NISA is decoupled from the production decisions of farmers, because it is paid on a lump-sum basis, but GRIP bases payments on individual farmer's recent yields and base acreage, excluding pasture and forage crops, whereas other programs provide producers with fuel rebates and tax incentives. Such programs encourage greater input use and production to the detriment of the environment (van Kooten & Folmer, 2004; Schmitz & Furtan, 2000). Unlike the United States, Canada relies on subsidies rather than conservation compliance to counter adverse

effects of agricultural programs and promote good environmental land uses.

Decoupling in Europe. The framework for price and support policy in the EU, known as common market organizations (CMOs), was developed over the period 1962–1969. The 1992/93 MacSharry reforms were the first attempt to decouple agricultural payments from production, although their primary purpose was to reduce the overall level of support. The reforms sought to lower EU prices toward the world price, compensate farmers for the lower prices via an income payment, and impose land set asides on larger crop producers. Agenda 2000 deepened the MacSharry reforms and emphasized the environment and provision of public goods.

The decoupling initiatives in these reform packages were not very effective, as they were only implemented on the largest farms (because small farmers could not handle the reporting requirements); many countries simply lacked the needed governance structures to implement the reforms (Brümmer & Koester, 2004). The June 2003 Luxembourg reform attempts to address problems by moving away from using a base acreage, relying instead on a payment based on *past payments* (Kelch & Normile, 2004). This avoids the temptation for nations to reestablish their acreage base, which shifts over time in any event.

Effectiveness of Decoupling Options

What can we say about the effectiveness of decoupling initiatives across regions and approaches? In comparing the effectiveness of decoupling options, we consider options for (a) determining yields in payment for-

mulas, (b) providing planting flexibility, and (c) allowing payments on land no longer farmed.

Freezing Payment Yields. Hertel, Tsigas, and Preckel (1990) projected that continuing to keep payment yields frozen under the 1990 U.S. farm legislation would reduce US variable input use (including chemical use) by 8%, while benefiting farm incomes, reducing commodity program outlays, and reducing distortions in world prices. A key challenge identified in the analysis (but not addressed in the legislation) was the need to update payment yields, because farmers want payments to increase with actual yields, which tend to increase over time (although differentially across the country). They anticipated that if the Food, Agriculture, Conservation, and Trade Act of 1990 had indexed payment yields in each state, the mounting pressure to reestablish payment yields on farms (which occurred in the 2002 Farm Bill) could be mitigated. Addressing US payment yields by freezing them and then applying an index offers one of the least disruptive decoupling options, because payments are still linked to farm-level crop yields.

When the EU introduced their version of a commodity payment system for several major commodities, they employed a *regional* yield that was not tied to yields on any individual farm, thus avoiding from the outset the above problems associated with reestablishing payment yields. (Canada previously used regional yields in its crop insurance program, although that program is now part of GRIP, which does not use regional yields.) Using regional yields in payment formulas results in a partial decoupling of payments, as government payments to farmers do not

encourage them to apply more chemicals per acre to increase their future subsidy payments. (As noted above, the United States attempted something similar through its freezing of payment yields.)

The payment formulas discussed in our analysis constitute a major, but by no means the total, share of the EU, US, and Canada's potentially trade-distorting farm programs. Export subsidies and various other protectionist devices also continue to distort agricultural prices, production, and trade. However, recent moves toward a greater reliance on payments (especially in the EU), as opposed to export subsidies, enhance the opportunities offered by our three decoupling options. The need for support payments of any kind are lowered whenever countries reduce output (by decoupling and/or reducing levels of support), thereby encouraging higher global prices.

Allowing Planting Flexibility. In the US, environmental concerns that commodity programs allegedly encouraged monoculture of grain crops provided one rationale for the early emphasis on planting flexibility. Historically, soybeans were not a program crop, but were needed for their environmental benefits in a crop rotation with corn. In practice, however, granting farmers planting flexibility proved much less environmentally beneficial than hypothesized. According to Babcock et al. (1997), the US experiment with planting flexibility in the 1996 Farm Bill did lead to significant crop acreage shifts; these shifts included a 23% increase in soybean acreage, which provided additional opportunities for crop rotation with Midwestern corn, as expected. However, they found that soybeans also replaced 3 million acres of wheat in

Kansas and 800,000 acres of CRP land. Thus, one can conclude that the net effect of increased planting flexibility in the 1996 Farm Bill was only a modest gain for the environment (Babcock et al., 1997).

The MacSharry reform in Europe allowed considerable planting flexibility from the beginning, so the EU's payment system had some market-oriented features since the early 1990s. Planting flexibility increases efficiency because it allows farmers to plant the most profitable crops, thereby reducing the financial burden of agricultural support programs, but environmental benefits are less clear.

Allowing Commodity Payments on Land No Longer Farmed. Permitting farmers to exit agriculture and still receive government payments offers an important policy option, particularly in North America where agriculture is much more extensive (especially in the Northern Plains). Commodity payments have shifted the extensive margin of cultivation and increased output on marginal lands. In spite of earlier efforts to change this, the United States allowed farmers in 2002 to reestablish the base acreage used in certain payment formulas.

The problem in the EU is that member countries have flexibility to design their own country-specific approaches to decoupling; this may lead to payments on land that is no longer farmed in some countries, but not all. For example, individual countries may offer coupled payments that are allowed on up to 25% of the area for arable crops (Kelch & Normile, 2004). Some countries apparently favor further development of payment systems tied to an acreage base, following the US approach.

Unlike the United States, Canadian programs are weaker in address-

ing environmental concerns: They contain no Sodbuster or Swampbuster provisions, for example, so they have been implicated in a major loss of prairie wetlands and in the resulting decline of ducks, shorebirds, and other migratory bird species (van Kooten, 1993). As noted above, Canada has taken steps toward decoupling, but payments to farmers under GRIP and some other programs (usually “emergency” payments when prices are considered too low) are still based on area “under cultivation,” as is the case under the Wheat Board marketing system, which is similar to the approach used in the United States for decades.

Other Remedies

There are other ways to address programs’ tendencies to increase the acreage cropped that are relevant to the decoupling topic. The Conservation Reserve Program idles over a tenth of US cropland and is joined by Sodbuster and Swampbuster programs, all of which address the tendency for price supports to expand production onto marginal cropland—to shift the extensive margin of agriculture and encroach upon nature. The EU recently introduced a 10% set-aside on larger farms, which is similar to the proportion of cropland idled by the CRP in the United States (but not targeted to achieve environmental benefits), and the EU introduced a reserve for tree planting to combat greenhouse gases. Canada is also set to provide payments to farmers to plant trees to earn offset credits under Kyoto, although it is discovering that this may be more expensive than originally anticipated.

These green payment mechanisms may appease trading partners

as they compensate, to some degree, for the program-induced increases in area cropped. However, they do so at a cost. If programs initially were designed in a way that avoids encouraging farmers to put more land into crop uses, costs of cropland idling programs could be reduced or avoided.

So What Have We Found?

Although the United States achieved an early start in decoupling payment mechanisms, the United States stepped back from fully decoupling payments in 2002. It is our view that policy revisions are needed to allow a recommitment to decoupling and reap its benefits. Namely, we feel there is a need to (a) establish a formula for payment yields that advances with time but is not farm specific, and (b) allow farmers to receive payments even if they cease growing a crop.

Although the EU and Canada have less experience with decoupling, they pursue some relatively effective decoupling options. Canada’s NISA program is a step in that direction. The EU may still fail to achieve fully its goals related to decoupling because they allow member states considerable flexibility, and some of them are already moving toward a system of base acreage, which presumably would need to be reestablished in the future, as acreage shifts over time.

We conclude that the EU and North America have reached a critical juncture, as they have the opportunity to pursue relatively painless decoupling-based remedies to costly trade distortions and environmental problems caused by domestic agricultural policies.

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Tracking and Testing Of US and Canadian Cattle Herds for BSE: A Risk Management Dilemma

Louis Anthony Cox, Jr., John J. VanSickle, Douglas A. Popken, and Ranajit Sahu

The United States has historically imported a substantial number of cattle from Canada. Given the discovery of a BSE-infected animal in Canada and another in the United States with Canadian heritage raises the question as to whether the United States should track and test imported animals. One alternative for the near term is to identify, permanently mark, and track Canadian cattle in the United States. We will use economic analysis to quantify and compare risk management and economic consequences of such an alternative in an effort to help policy analysts and decision makers decide how best to assess and manage uncertain risks of BSE in the United States from imported cattle.

Background

Canada has tested thousands of cattle per year for Bovine Spongiform Encephalopathy (BSE)—3,377 animals in 2002—but has found only one cow with BSE. In the province of Alberta where the infected animal was found, “the brains of 2,769 targeted cattle were tested from October 1996 to March 31, 2004. One cow, condemned at slaughter (did not enter the human food chain), was confirmed positive for BSE in May 2003.... Brain tissue samples from the remaining 2768 cattle had no evidence of BSE” (Government of Alberta, 2004). The Canadian cattle tested included animals that exhibited neurological signs and/or emaciation as well as postmortem samples submitted to provincial diagnostic laboratories. If, based on European experience, targeted animals are about 60 times more likely to have BSE than nontargeted animals (Doherr et al., 2001), then the prevalence rate of BSE among nontargeted cattle would be about six per million cattle $((1/2,768) \cdot (1/60))$.

In December 2003, a second dairy cow from Alberta, imported into the United States to the state of Washington, was also diagnosed with BSE. The United States Department of Agriculture’s APHIS Veterinary Services (VS) issued an “Explanatory Note” in February 2004, following an investigation by the USDA and the Canadian Food Inspection Agency (CFIA). The note concluded that the previous risk analysis of Canadian cattle and beef products imported into the United States remained unchanged by the new case and that the risks remained low. They noted that both of the BSE cases of Canadian origin occurred in cattle born before the implementation of the feed ban on the use of animal neurological matter in livestock feed, which is alleged to be the main way the disease spreads (USDA, 2004).

The detection of two BSE cases from Alberta in less than eight months raises the question: What is the current prevalence of BSE in Canadian cattle? From a risk management perspective, the key question is what actions, if any, should be taken given the uncertainty about the true prevalence of BSE in Canadian cattle. This decision problem is made more challenging by high economic stakes and by scientific uncertainties regarding BSE sources, reservoirs, and dynamics. Additionally, false positives might be economically damaging—the USDA’s reports of unconfirmed BSE cases that turned out to be false had market impacts.

Scientific unknowns make predictive modeling highly uncertain, creating a dilemma for both health and economic risk management. Experience since 2003 has shown that the presence of confirmed BSE cases dramatically reduces US beef exports, even when the infected animals originated outside the United States. If the true prevalence of BSE in Canadian cattle shipped to the United States

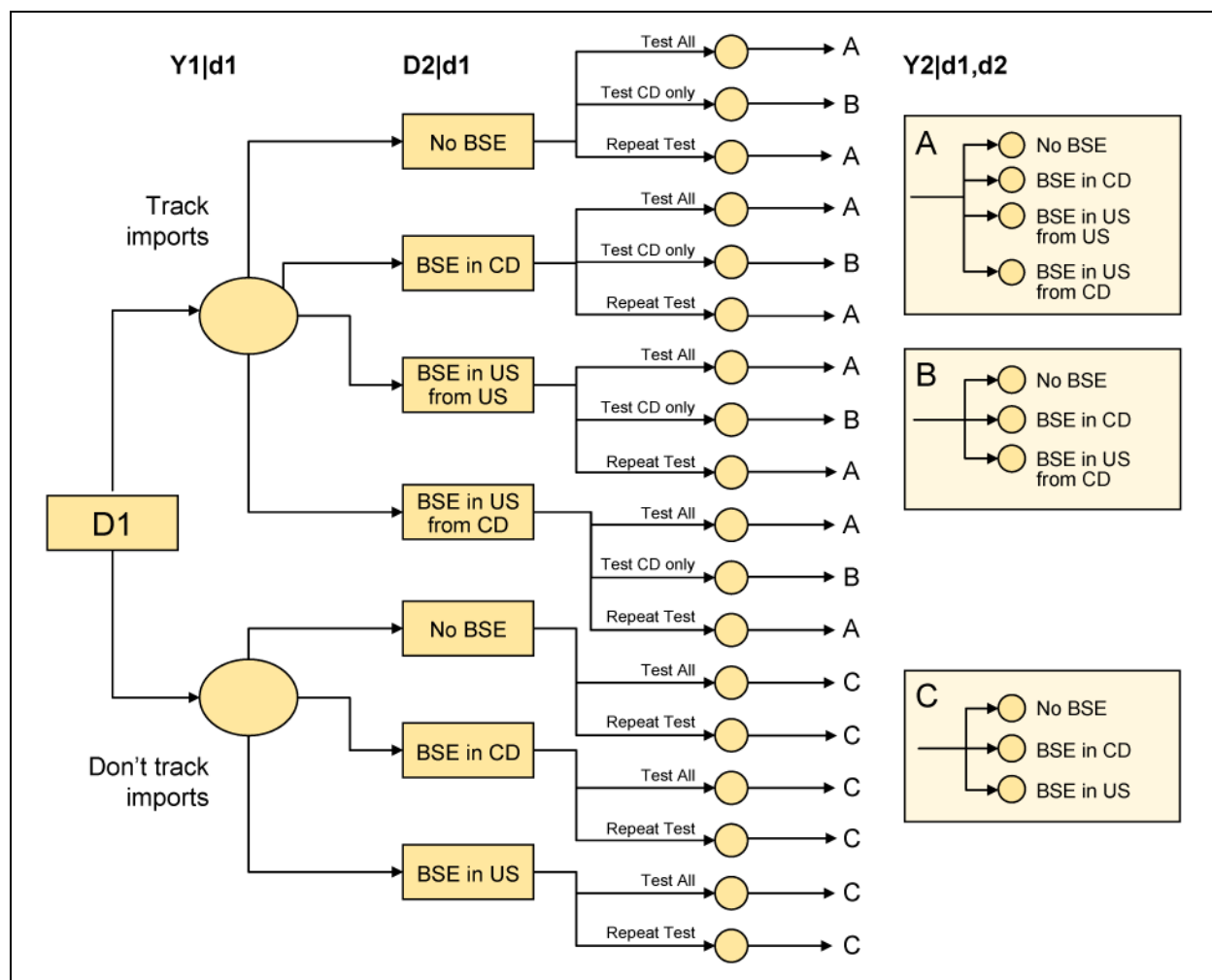


Figure 1. Decision tree for BSE testing policy.

were known to be as high as six per million head, then continued prevention of cattle imports from Canada might be expected. On the other hand, if the prevalence of BSE in Canadian cattle were known to be much smaller or zero, then the advantages of trade could be gained by allowing unrestricted imports. Given the high economic stakes and uncertainties, it has been difficult to decide or objectively evaluate what policies would best promote US and international interests. Options range from the status quo (preserving current import restrictions and testing programs) to tightening or loosening import policies. Another alternative involves gathering more information

before deciding. This might be done by tracking and testing Canadian cattle as they enter and live in the United States and then using this information in support of decisions on import restrictions. Discovery of which of these (or other) options is most desirable requires comparing their associated chances of gains and losses.

Formulating the Risk Management Decision Problem

Figure 1 outlines the decision alternatives to be compared in a sequential manner. An initial (Stage 1) decision whether to track Canadian cattle in the US (“Track CD imports”) or not to track them (“Do

not track CD imports”) is followed by arrival of additional information from ongoing sampling and BSE testing programs in the US and Canada. If the Stage 1 decision was “Track CD imports,” then in the next year, any of the following informative events may be observed:

- no new BSE cases are detected;
- BSE case(s) of Canadian origin are detected in the United States;
- BSE case(s) of US origin are detected in the United States; or
- BSE case(s) of Canadian origin are detected in Canada.

If the Stage 1 decision is “Don’t track CD imports,” then the four possible observations for the next period are

aggregated to only the following three:

- no new BSE cases are detected;
- new BSE case(s) are detected in Canada; or
- new BSE case(s) are detected in the United States.

A Stage 1 decision to track imports increases the chances that the origin of a new case can be determined.

After the Stage 1 decision, and given updated information about any new BSE cases, a subsequent (Stage 2) decision will be made about whether to sell and process healthy-appearing cattle without first requiring them to be tested for BSE (“No required test”), versus requiring all US cattle to be tested for BSE before being sold or processed (“Test all”), versus requiring only all Canadian cattle in the United States to be tested for BSE before being sold or processed (“Require testing for CD cattle only”). The latter option is available only if the Stage 1 decision was to track Canadian cattle imports. Stage 2 decisions will be made conditional on the information available then. For example, if a new BSE case of unknown origin is detected in the United States, then the best Stage 2 decision might be to test all US cattle at slaughter to reduce export and domestic losses; if the origin of the case is known to be Canadian and the Stage 1 decision was to track Canadian imports, then the best Stage 2 decision might be to require testing for Canadian cattle only.

Estimated Economic Consequences of Detecting Additional BSE Cases

Given this decision problem, one may estimate the economic costs associated with each terminal node (i.e., “leaf” node) at the tips of Figure 1. Three types of costs will be consid-

ered: tracking costs, testing costs, and market costs. Tracking costs are estimated to be \$30.7 million and represent the cost of permanently marking each live animal coming into the United States, including labor and materials. Testing costs represent the costs of the BSE tests, including kits, labor, shipping, holding, laboratory facilities, and expenses. Testing all cattle in the United States is estimated to total \$1.09 billion. Testing Canadian cattle only would cost \$47.3 million, and testing only those animals that fail an initial screening test would cost \$2.4 million.

Market costs represent market losses (or gains) associated with each second-stage outcome as a function of all that occurred up to that point. These costs are dependent on the source of the BSE animal and the type of tracking and testing programs in place when the discovery occurs. These impacts range from a loss of \$12.2 billion when there is a case of BSE in the United States from a US animal to a gain of \$1.3 billion when there is a case of BSE in Canada and tracking of Canadian cattle in the United States. The full set of possible outcomes can be found in Cox et al. (2004).

BSE Decision Consequences

The economic consequences of tracking Canadian cattle imports depend on the chances as to whether and where BSE is detected. The probabilities of the different economic consequences, given the choices of Stage 1 and Stage 2 decisions, are estimates of the probabilities of finding one or more BSE-positive cattle among each batch of 1,000 tested. The probabilities of the different outcomes were estimated from data collected following the discovery of the first BSE animal in

Canada. The full set of probabilities can be found in Cox et al. (2004).

Consequences of Decisions in the Base Case

Under the baseline assumptions, the expected net cost to track imports is \$10.3 million per year, while the expected cost to do not track imports is \$90.0 million per year. Thus, the expected net economic value of the information provided by tracking is \$79.7 million per year, reflecting a much higher probability of large market losses when imports are not tracked. Such large results occur because without tracking, BSE cases of Canadian origin in the United States cannot be distinguished from (and therefore have the same economic impact as) BSE cases of US origin. The least-cost rule then is to track Canadian cattle imports, then continue limited sampling in Stage 2 no matter what occurs. In other words, the benefit from tracking in this case does not come from avoiding the cost of 100% testing of US cattle, because this is costly. Rather, it comes from the assumed reduced loss of US beef sales if the country of origin of a BSE case detected in the United States is Canada and this can be ascertained and announced.

A sensitivity analysis, where we varied the probabilities and costs, indicates that the dominance of this decision is robust to many variations in the input data, suggesting that the model’s recommendation to begin tracking may be well justified despite remaining uncertainties. The economic value of tracking information comes primarily from limited export losses and from avoiding the need to test all US cattle to win back customers. Although the best second-stage decisions vary across sensitivity analysis cases, most results agree that

tracking is the optimal current decision, even while differing in their precise (Stage 2 planning) reasons.

Impacts of Possible Win-Back of Export Markets

The above analysis pessimistically assumes that the losses of US cattle and beef export markets following the discovery of a Canadian-origin BSE case in December 2003 are persistent and irreversible. If policies in the United States result in recovery of some of the lost export markets, then the economic impacts from tracking and testing could dwarf those calculated for the base case. For example, under an assumption that aggressive testing would allow the United States to regain its lost exports (as long as no confirmed BSE case of US origin is discovered), the optimal strategy becomes to immediately start tracking all Canadian cattle and, if a confirmed BSE case of Canadian origin is found, to test all Canadian-origin cattle in the United States prior to export. In this case, the expected net economic value of the information provided by tracking increases to \$771.6 million per year.

Concluding Comments

This analysis suggests that the economic value of information provided by tracking of imports and implementation of testing programs in the United States greatly exceeds its costs for cattle that may be imported in the future. For “legacy” Canadian cattle that have already entered the United States, moving quickly to locate and

start tracking them before any additional BSE cases are detected appears to be well justified for almost any plausible set of input assumptions, provided that the cost per head is kept within bounds (up to \$35/head, based on the sensitivity analyses for the base case). If the costs per head are too great to justify locating all legacy animals, then location and tracking efforts should focus on the oldest animals—those with the greatest risk of becoming new BSE cases.

The analysis provided here focuses on potential economic consequences and risk management options for possibly mitigating losses if another BSE case is discovered in the United States. The possibility that some BSE cases might pose (currently unquantified) health risks of variant Creutzfeldt Jakob Disease (vCJD) to humans reinforces the conclusions by increasing the importance of being able to identify the origin of any new BSE cases quickly.

That tracking and testing may be imperfect has sometimes been advanced as a qualitative argument for restricting or rejecting them. The quantitative comparisons in the sensitivity analyses suggest that this reasoning is usually not justified: Measures that help to identify the origins and prevalence of BSE cases have high information value for improving future risk management decisions and creating additional risk management options, even if they are less than perfect.

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Coming Attractions

Resources and the Environment

Markets for Environmental Goods and Emissions

Transferable rights are increasingly being used to regulate pollutant emissions or usage of environmentally sensitive items. In turn, markets are developing to allow the exchange of these rights among interested parties. In the next issue of *Choices*, we explore the general motivation for such approaches as well as market experience and/or issues regarding trading sulfur dioxide emissions, rights to divert water, water-pollutant-related emissions, and wetland banking. Among these cases are market successes and disappointments.

Agribusiness and Finance

The New Face of Agricultural Lending

The attempted acquisition of a major piece of the Farm Credit System by Rabobank, a Dutch-based commercial bank active in the global marketplace, is one of several topics addressed in this theme. Although the sale ultimately fell through, it left a number of issues in its wake. The Basel II Capital Accords, which call for the adoption of more risk-sensitive minimum capital requirements for banking organizations, raise management issues for lenders as well. The articles in this theme address these as well as broader issues that are likely to have an impact on agricultural lending.

We are working on future theme coverage on food safety, supply chains, appraising nonmarket environmental attributes, biofuels, US participation in the WTO, and checkoff programs.

