

Update of Cost Assessments for Country of Origin Labeling – Beef & Pork (2009)

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I. Background

The 2002 U.S. Farm Security and Rural Investment Act (or 2002 Farm Bill) created new mandatory country-of-origin labeling (COOL) requirements for beef, lamb, pork, fish and shellfish, fruits and vegetables and peanuts sold at certain U.S. retail outlets. These requirements did not apply to hotels, restaurants and institutions serving food, nor did they apply to processed food.

In June 2008, COOL was modified in *The Food, Conservation, and Energy Act of 2008* (or 2008 Farm Bill) by removing some of the details in the labeling requirements and by adding meat from goats and chickens, ginseng, macadamia nuts and pecans to the initial list of covered commodities. While the labeling requirements were adjusted to a modest degree as will be outlined in this report, the documentation and tracking requirements were changed rather significantly reducing the burden of origin proof on the live animal participants in the beef and pork supply verticals.

COOL was implemented for fish and shellfish beginning in April 2005. However, it was delayed for all other meat commodities until September 30, 2008, which is when the Interim Final Rule for remaining meat commodities came into effect.

Around that time, Canadian livestock producers began reporting negative pricing and market impacts as a result of the provisions contained in the Interim Final Rule. This included instances of major price discounting of Canadian live animals and reduced live animal exports due to restrictions on the days and locations where U.S. processors were accepting Canadian animals. In effect, the costs associated with complying with the COOL regulations began being reflected in the prices being paid in the market for Canadian/Mexican origin cattle, calves, and pigs on or in advance of the implementation of COOL on September 30, 2008.

The Final Rule on COOL, which was published in the Federal Register on January 15, 2009, provided additional flexibility than originally expected with respect to the labeling of meat derived from animals of different national origins that had been commingled during a production run. These less stringent rules are thought to have had a reducing effect on implementation costs within both the US beef and pork supply chains and these changes will be identified and discussed in this analysis.

On February 20, 2009 the USDA issued a press release stating that they would proceed with implementation of the Final Rule on COOL as scheduled on March 16, 2009 and the rule did go into effect on March 16th as scheduled. At the same time that the U.S. Secretary of Agriculture indicated a March 16th effective date for COOL, he also sent an open letter to U.S. industry participants asking them to voluntarily comply with stricter labeling measures (than those included in the Final Rule) pertaining to products from multiple countries of

origin, processed foods and certain inventory allowances for ground meat. This request was met with significant industry opposition and effectively became a non issue (no enforcement capability) although it probably has heightened US stakeholder's sensitivities to being highly compliant with the rules as implemented.

The Secretary of Agriculture has indicated that he will carefully monitor implementation of the Final Rule and compliance with these voluntary guidelines by retailers and their suppliers. This information will be factored into the Secretary's consideration of whether the USDA will pursue additional rule-making on COOL.

In April 2003, Sparks Companies, Inc. (now Informa Economics, Inc.) published a cost assessment for COOL based on anticipated implementation requirements as could best be determined at that point in time. The US supply chain requirements for the COOL program that has been implemented are less stringent than those first anticipated when COOL was included in the 2002 Farm Bill. One would hypothesize that supply chain costs will be lower than originally estimated because of these less stringent rules.

The reassessment of COOL costs contained in this analysis reflects the changes in supply chain requirements under the new implementing regulations and provides updated cost estimates for supply chain participants in the US beef and pork sectors. Given the nature of the changes in COOL requirements as well as other supply chain issues that have become interwoven with the COOL issue, the process of identifying current costs of COOL are more complex now than Informa experienced in the initial work. Much of this is due to decisions that US processors and retailers have made regarding their willingness to handle animals and product of mixed origin.

II. Study Objectives

The objective of this study is to obtain an updated cost assessment regarding the costs due to the COOL provisions as revised and passed in the 2008 Farm Bill and brought into law on September 30, 2008. The final rules of implementation were not published in the Federal Register until January 16, 2009 but were put into force on March 16, 2009. The requirements for the beef and pork industries to be in compliance with the new COOL regulations are different than those originally anticipated. This analysis will provide a side-by-side comparison of the current beef and pork supply chain costs compared to those estimated back in 2003 by Sparks Companies, Inc. (now Informa Economics, Inc.). Two sets of supply chain COOL costs as well as an aggregate cost are provided for 2009. One reflects COOL costs associated with supply chain configuration for the utilization of US origin product only. The other identifies the system costs for those operations that have configured their businesses to utilize animals and product sourced from mixed origins. A detailed discussion of the two sets of COOL cost estimates is provided in the following sections of this report.

III. Cattle and Beef Supply Chain

1. Unit Cost Estimates

Table 1 provides a summary snapshot of US beef supply chain per unit costs comparing estimates prepared by Sparks Companies in 2003 with current Informa estimates for 2009. It is important to note that supply chain costs under the version of COOL that has now been implemented must be broken into two classifications to account for increased flexibility in the program. As COOL moved into implementation, a large number of US retailers, due to cost considerations, made a determination that they would utilize only product from US animals and this requirement has been written into their beef product specifications. Consequently, the requirements to satisfy the labeling law when only US origin cattle and beef are acceptable are much different and less onerous than are the requirements which allow for the use of mixed origin livestock and beef. Consequently, a second column of per unit cost estimates have been prepared in this analysis reflecting supply chain costs for those beef supply chain participants configured to handle and label mixed origin fresh beef products.

In general, current costs are sharply less at the live animal production level (cow calf and feedlot) relative to those estimated under the initial version of the law and this holds true whether one is assessing US only origin cattle or cattle from mixed origins. The COOL law that was passed as part of the 2008 Farm Bill and the Final Implementation Rules that went into effect in March 2009 are much less onerous as it relates to tracking and accounting for animals as they move through the supply chain. In the original 2003 estimates, it was thought that all US as well as foreign cattle would need to be individually identified and tracked through the supply chain and that specific documentation regarding these animals would need to be initiated at the cow calf production level with that documentation flowing from one supply chain participant to the next as cattle were bought and sold.

Under the current program, US cow calf producers will only need to sign an affidavit indicating that the animals the producer is selling are of US origin. For US cow calf producers, this effectively eliminates much of the cost of the program which is now estimated at 25 cents per head. We suggest that there should be no costs for cow calf producers for the mixed origin calculation as cow calf producers are unlikely to buy Canadian or Mexican origin calves. In those few instances where cow calf producers may engage in the importation of Canadian/Mexican calves, such cattle would require documentation as to the origin of these cattle. This would occur as the cattle crossed the border into the US and US cow calf producers would merely need to pass this documentation along with the cattle as they are sold, similar to the affidavits required of US born calves.

Table 1 Beef Supply Chain COOL Cost Estimates

	2003 \$/head*	2009 US Only Origin \$/head	2009 Mixed Origin Animals/Products \$/head
Cow-calf Producer	4.88	.25	Not applicable
Feedlot/Backgrounder	3.75-5.75	.25	.50-1.00
Packer/Processor	15.00-18.00	.25	10.00-18.00
Retail distribution and Retail Store	23.00	.75	35.00-40.00
Total	46.63-51.63	1.50	45.50-59.00

* Costs reported in the Sparks April 2003 analysis.

The identification and record keeping requirements for feedlots using only US origin animals would be much less burdensome under the current COOL program than was originally estimated once again because the animal origin burden on the feedlot operation is limited to maintaining a proper record of the seller's affidavits and passing this information on as the cattle are sold to the packer. For mixed origin cattle feeding operations, there may be a need to segregate Canadian or Mexican origin feeder cattle and calves in the feedlot to maintain identity preservation. This certainly would be the least costly mode of operation for handling mixed origin cattle. Such segregation amounts to a modest additional cost to the feedlot operation as feedlot operators would likely deal in pen size quantities whereby pens are fully loaded up with cattle from the various origins whether that be US cattle or imported cattle. It is estimated that the cost to the feedlot for configuring his operation to handle mixed origin cattle would be \$.50-1.00/head. The greatest reservation expressed by feedlot operators regarding mixed origin feeding is the concern that the non US origin cattle will command a reduced price from their packer buyer over and above the probable discounted cost of the animal put into the yard. The market will ultimately determine what these pricing differentials need to be, if any.

Where COOL costs start to have a more burdensome and differential cost impact is at the packer/processing level. The cost at this level of the supply chain will be highly dependent upon whether the slaughter operation is self-designated as a US origin only slaughter facility or whether it is a plant that will accept cattle of mixed origins. For a packer/processor that has made the determination to slaughter only US cattle with their output being sold to retailers that specify only US origin beef and/or to food service customers where origin is immaterial, the costs for the slaughter operation are sharply reduced from those originally estimated in the 2003 study conducted by Sparks. For a US only packer/processor, the COOL costs would be reduced to only those for record keeping requirements and the labeling of boxes as being of US origin. This cost is estimated at being no more than 25 cents per head.

For those slaughter operations where a mixed origin kill is utilized, the original cost estimate of \$15-18/head is still mostly valid although we have widened out the cost range to \$10-18/head. These plants may choose to segregate the foreign origin product from the US product in order to capture optimal value for their combined production. It is likely that

plants that accept foreign origin cattle will designate specific days or shifts to slaughter/process mixed origin animals and they will need to have a retail customer base that will accept the B Label or food service customers where animal origin is of no consequence to their business. With proper tracking, such plants will also sell Label A product (US origin) if they fully segregate the US origin animals and beef from the foreign origin animals. The added efforts associated with this segregation of product by origin push costs to the high end of the stated range and are so steep relative to using just US origin product; one can conclude that few plants will fully engage in this activity. Those that use Canadian and/or Mexican cattle in their kills will either co-mingle the product and use the B Label or go the designation route whereby US only kill days will occur along with designated kill days for mixed origin animals. At minimum, we estimate a \$10/head cost increase for mixed origin plants.

Overall, one can see that the costs associated with the current COOL regulations are sharply reduced for the cow-calf and feedlot segments of the supply chain and are sharply lower for the packer/processor electing to slaughter and process US only cattle. Costs are expected to be unchanged to possibly a bit lower for plants set up to handle mixed origin cattle kills relative to the 2003 estimates.

At the distribution/retail level, the costs associated with COOL are higher than originally estimated in the 2003 Sparks study for those retailers that create the system for handling and labeling mixed origin as well as US origin product. Originally, it was estimated that costs to the retailer would be about \$23/head to identify, label segregate and track the product through distribution and retail. Actual experience with other commodities (seafood and fruits/vegetables) along with cost in the meat case that have been incurred since implementation of the Final Rule would suggest that the costs at retail for mixed origin capabilities for beef are more in the \$35-40/head range.

Retailers that are posturing themselves to handle US as well as mixed origin beef have had to make a full scale change in their scales to add the capability of labeling packages in the meat case as is now required by the COOL law. Meat case signage is no longer acceptable and the retailer is still responsible for being able to document that the labeling of the product as either US, or some mix of US/foreign mix of product is accurate. This requirement is essential in order to pass audits and has boosted the cost of COOL at the consumer contact point.

Because of the high cost of configuring a retail operation to handle Label A, B and C product and the additional SKU's that such a system would require, most US retailers have elected to go strictly to only US origin product (Label A). With specifications requiring that their suppliers put only US origin product into the system, retailers can merely set up their stores to label all product as US origin. This does not require the large investment in new scales to handle mixed origin and labeled product. It is estimated that the costs for such retailers is only \$.75/head (or $\frac{3}{4}$ of a cent a pound) which is minimal as compared to the costs for labeling flexibility. For most retailers, this has been the path of least resistance and certainly, least cost. In the process, business actions have sharply reduced the overall costs of COOL to the US beef supply chain.

In summary, the COOL regulations as they are now defined carry with them less costs for compliance than originally estimated **IF** the beef supply chain is configured to handle only US origin product as determined by the retailer's specifications. Informa estimates this cost at only \$1.50/head as compared to costs in the \$50/head range originally estimated in 2003. There would still be significant costs of \$45-59/head for those supply chain participants structured to handle mixed origin product. It is not surprising that with such a wide differential between US origin versus mixed origin supply chain costs, most US supply chain participants have chosen the US only product configuration.

The cost for the cow calf operator and feedlot operation are relatively minor under current law as signed affidavits are sufficient to identify the origin of the cattle. At the packer/processor level, a two-tiered costing structure emerges depending upon whether or not the packer/processor sets up his operation to handle only US origin cattle or elects to slaughter mixed origin cattle. For US only cattle, the cost is relatively small while those packers that configure their operations to handle mixed origin animals will have costs somewhat similar to those identified in the 2003 study. Costs are much higher for handling mixed origin cattle due to sorting of animals by shift, segregating product by origin, etc. all of which slows down chain speeds and requires additional SKU's. Without this cost and effort, the packer/processor would receive discounted sales values on his entire output and presumably would be paying discounted procurement prices only on foreign origin cattle.

The greatest cost burden to the US beef supply chain for labeling flexibility occurs at the retail distribution and retail store level. Interviews and first hand calculations conducted by Informa with retailers that cooperated in the 2003 study reflect a higher COOL cost burden than originally thought for those retailers configured to handle product of mixed origin. The cost for such operations translates into 4.5-7.5 cents per pound (carcass weight basis). Those retailers that elect to use US product only in their specifications would have a relatively low cost burden estimated at \$.70/head which translates into approximately one-tenth of a cent per retail pound sold.

The extra costs associated with handling Canadian and/or Mexican cattle and beef as opposed to just US origin cattle would be about \$50/head at the mid point of the estimated per head cost range which translates into about 6.5 cents per pound on a carcass weight basis. Costs relative to those estimated in 2003 would be roughly the same or a little higher for mixed origin utilization but substantially less for companies that choose the US product only supply chain configuration.

It should be noted that only select retailers in the US have incurred all of the costs associated with handling the various labels of beef. Several of the major retailers have made the investment in being able to handle Label A, B and C product despite the added costs as they have concerns regarding the overall availability of US origin production to satisfy their needs. Many of these retailers have also experienced the need to configure their supply chains to handle product recalls as well as satisfy other traceability requirements so the added costs are not all strictly related to the implementation of COOL. Many US retailers have taken the stance of building US origin requirements into their product specifications thereby eliminating the investment required to be able to document mixed origin product. By

specifying they will accept only US origin product from their suppliers, they are pushing the onus back on the supplier to bring them only product bearing Label A.

2. Beef Supply Chain Aggregate Cost Calculations

In this section of the report, estimated beef supply chain costs associated with COOL requirements are provided. The original supply chain segment and aggregate industry costs from the 2003 Sparks study are provided in Table 2. For 2009, parallel supply chain costs are provided based on changes that have occurred in the legislation and implementing rules that are now in place. As shown in Table 2, the 2003 industry cost estimate aggregated to a total dollar value of \$1.571-\$1.716 billion dollars based on per head cost estimates ranging from slightly more than \$47/head to as high as nearly \$52/head.

Table 2 Beef Supply Chain Cool Cost Estimates-2003

	\$/Head	Segment Cost (Million \$)	Calculation Process
Cow-Calf Producer, Backgrounders	\$4.88	\$198.0	38 Million Head Calf Crop 2.5 Million Head Imports
Feedlot	\$3.75-5.75	\$109-\$167	29 Million Head Sold
Packer/Processor	\$15.00-18.00	\$435-522	29 Million Head Steer/Heifer
Retail Distribution and Retail Store	\$23.00	\$805	8 Billion lbs. sold @ 10 cents/lb from 35 Million Cattle
TOTAL	\$46.63-\$51.63	\$1,571-\$1,716	

Based on the volume metrics in place in 2003, segment costs were estimated at \$198 million for the cow-calf and backgrounding segments of the industry. The feedlot sector rolled up to a cost ranging from \$109-167 million while the packer/processor sector was expected to incur costs ranging from \$435 to \$522 million for the steer/heifer portion of the kill and an estimated \$24 million for the slaughter of cows and bulls. A huge cost burden was estimated in 2003 for the retail distribution and retail store segment of the industry due to rather detailed and restrictive labeling requirements as reflected in the original legislation. The cost for this segment of the industry was estimated to be \$805 million covering an estimated 8 billion pounds of covered fresh beef products at a cost of 10 cents per pound of product labeled and sold.

Table 3 provides similar beef supply chain cost estimates for 2009 based on year-to-date and projected supply chain volume metrics. The quantities of cattle and beef being raised, imported, slaughtered and sold through retail outlets has declined since 2003 and the per head costs have changed rather significantly at various levels of the supply chain from those estimated/calculated in 2003. There are also significant cost differentials for the supply chain

depending upon whether the supply chain is configured to only handle Label A product or whether it is set up to handle all origin labels and hence, a mixed origin product set.

The costs per head and per pound in 2009 for US origin only product and mixed origin product were presented in Table 1. The segment costs reflected in Table 3 apply these per unit COOL costs to the appropriate supply metric for each level of the supply chain. The aggregation of the segment costs associated with complying with the COOL regulations (as implemented) provides an estimate of total cattle and beef supply chain costs.

As shown in Table 3, most of the supply chain costs associated with the current COOL regulations will be born by those business entities that choose to handle and merchandise all labels specified in the law; namely Label A (US only product); Label B (beef from animals born outside the US but fed and slaughtered in the US) and Label C (animals born and feed outside the US but slaughtered in US plants). As shown in Table 1, the costs per head for companies that specify only US origin product are relatively modest. Based on industry indications of slaughter/processing capacity that will be designated strictly as US origin as well as retailers that will merchandise only US origin product (Label A), it is estimated that this configuration of the US beef industry will bear a total cost of \$25.7 million. This would reflect costs associated with the slaughter of 16.5 million head of steers and heifers, 6.6 million head of cows and bulls and the sale of 2 billion pounds of fresh beef at a cost of 3.1 cents per pound of product sold to cover costs at distribution and retail stores. Producer costs (cow calf, backgrounder and feedlot) for the US only calculation would total about \$15 million.

Costs under the mixed origin cost column are substantially higher with most of this cost realized at the packer/processor and retail distribution and sales level. There would be no additional costs for the US cow calf producer for animals moving into mixed origin marketing channels and only a small total dollar outlay for added costs of imported feeder cattle which may or may not go into backgrounding operations before entering feedlots. Informa estimates that these added costs would run from a low of \$600,000 per year to a high of \$1.3 million per year.

Table 3 Beef Supply Chain Cool Cost Estimates-2009

	US Only Segment Cost (Mil \$)	Calculation Process	Mixed Origin Animals & Products Cost (Mil \$)	Calculation Process
Cow-Calf Producer	\$8.9	35.6 Mil Head Calf Crop		Not Applicable
Feedlot Backgrounder	\$6.3	25.2 Mil Head Sold	\$.6-\$1.3	1.27 Mil Head Sold
Packer Processor	\$4.1 \$1.7	16.5 Mil Head Steer/Heifer 6.6 Mil Head Cows/Bulls @ \$0.25/hd	\$100-180 \$.2	10 Mil Head Steer/Heifer .2 Mil Head Cows/Bulls @ \$1/hd
Retail Distribution and Retail Store	\$62.0	2.0 Bil lbs. sold @ 3.1 cents/lb. from 8.3 Mil Cattle	\$875-1000	5.9 Bil lbs. sold @ 14.8-16.9 cents/lb- from 25 Mil Cattle
Sub-Total	\$83.0		\$975.8-\$1181.5	
Supply Chain Total				\$1058.8-\$1264.5

The costs of COOL for creating flexibility to handle multiple product sets that will meet the three different labels as defined in the law are sharply above those for US only product. Slaughter operations will need to create the ability to segregate US origin cattle from Canadian or Mexican origin cattle if they plan to segregate the beef products by Label A, B or C. The costs for creating this segmentation and tracking capability are estimated at \$10-18/head and it is our best estimate that 10 million head of steers and heifers will be subject to these higher costs. An estimated 200,000 head of cows are also expected to undergo some magnitude of segregation although this will be done to make sure product from these animals enters processing or food service channels as none is expected to enter the fresh beef retail trade.

Based on industry discussions and Informa knowledge regarding retailers that are configuring their operations to handle multiple COOL labels, it is estimated that about 75% of actual beef sales will be through retail operations that have invested in the capability to handle one or more of the labels. This would suggest that 5.9 billion pounds of beef will be subject to costs at the retail level of the supply chain ranging from 14.8 to 16.9 cents per

pound. This translates into a significant cost ranging from \$875 million to \$1 billion. One can certainly question whether this magnitude of mixed origin beef merchandising will evolve but several major national retail and club chains have made the investment in this capability despite the high cost. The most common argument given for taking on these higher costs is concerns over long term supply availability.

When all segment costs are added up, Informa would put total supply chain COOL costs at \$1.058-1.265 billion. This compares to the original supply chain cost estimates made by Sparks in 2003 of \$1.57 to \$1.72 billion. Aggregate costs are less than originally estimated due to lower identification and traceability costs at the producer and cattle feeding levels of the supply chain. The total cost outlay at the packer/processor level is also less than in 2003 while the cost at retail is higher than originally estimated.

IV. Hog and Pork Supply Chain

1. Unit Cost Estimates

Within the US hog industry there are several different types of hog production systems and industry configurations with the differences associated primarily with the degree of integration that is in place; both as it relates to the actual live production but also as it relates to integration into the packing processing sector. In the original COOL costing work done by Sparks in 2003 and then updated by Informa in 2007, consideration of these industry structure issues were provided in the presentation of the supply chain costs for the US pork industry. Informa has maintained the format used in previous studies but as with the beef supply chain, the costs associated with the implementation of the Final Rule for COOL requires the 2009 estimates to be broken down into supply chain costs that reflect utilization of US origin hogs/pork only as well as costs associated with utilization of mixed origin (Canadian and US) live hogs and pork.

Table 4 provides per unit cost estimates for the full range of supply chain categories. A discussion of each of these supply chain segments is warranted. For the integrated hog production and packer processor firm, COOL costs under the new COOL regulations will be lower than those estimated both in 2003 and in 2007. These firms have taken an all US origin posture as it relates to COOL so one affidavit reflecting that the entire supply chain is using only US origin hogs cuts the cost for these firms to minimal levels. We have put a range from 0 to 10 cents per head as compared to 50 cents per head estimated in the earlier studies. It is expected that much of the product flowing from these integrators will be to retailers that have also identified themselves as US origin pork users and consequently, the cost for such operations is only expected to be 25-35 cents per hog. In effect, this segment of the US pork supply chain effectively by-passes the costs associated with COOL with the exception of minor outlays for handling paperwork that would validate their Label A claims.

For large scale closed production systems that are not integrated into the packer/processing level but produce only US origin hogs, the COOL costs will also be minimal (0-10 cents per hog). These large systems can be expected to market their hogs primarily to packers that are US origin only in some or all of their plant(s). As a result, the costs for this group will be no different than for the large integrated firms. Should product from this configuration flow into a mixed origin retailer as Label A pork, such product would be expected to have higher retail costs (4.5-6.0 cents per fresh retail pound sold) but this is a cost that mixed origin retailers will have to overcome as they will not be able to pass this cost back down through the supply chain. It would be our judgment that packers handling this product would sell this US only product to the highest bidder whether this is a US only or mixed origin retail establishment.

Table 4 Pork Supply Chain COOL Cost Estimates

	2003 \$/head*	2007 Update \$/head	2009 US Origin Only \$/head	2009 Mixed Origin \$/head
Integrated Hog Production and Packer/Processor System (US only)	0.5	Same cost	Minimal 0-.10	Not applicable
Large Scale Closed Production System, Non-Integrated (US only), (farrow/wean/finish) ¹	0.75	Same cost	Minimal 0-.10	Not applicable
Small independent, Non-Integrated (US only farrow/wean/finish)	1.50	Same cost	Minimal 0-.10	Not applicable
Small independent, Non-Integrated (Mixed origin farrow/wean/finish)	1.50	Same cost	Not applicable	0.25-.50
Non-Integrated (US only) Packer/Processor	2.00-6.00	5.00-6.00	Minimal 0-.10	Not applicable
Non-Integrated Mixed Origin Packer/Processor	2.00-6.00	5.00-6.00	Not applicable	5.00-6.00
Sow and Boars	2.00	None available	Minimal	Not applicable
Retail Distribution and Retail Store	2.75/hd ~ 7.5 cents/lb.	1.65-2.00/hd ~ 4.5 to 6.0 cents/lb.	.25/hd .007 cents per pound	1.65-2.00/hd ~ 4.5 to 6.0 cents/lb.
Total	3.25-10.25	2.15-9.50	.25-.35	6.90-8.50

*Costs reported in the Sparks April 2003 analysis

The same argument can be put forward for the small, independent hog producer that raises and feeds only US origin hogs (mostly his own). Such operations would once again have minimal costs for providing documentation that the hogs are only of US origin but those costs will be no different than for the large integrated firm or the large scale closed production system. One could expect that hogs of US origin will flow to packers/processors that only take US origin hogs into their processing operations so costs related to COOL during slaughter will remain in line with the other US only configurations. Since the product

from this configuration will carry a Label A, it will be sold to retailers as such and could flow to either US only retailers or mixed origin retailers.

There are a number of US hog operations that raise US origin hogs but may also feed isoweans or feeder pigs of Canadian origin. Most of these are small or medium sized independent and nonintegrated operations. For herd health purposes, one would expect finishing operations that are feeding both US origin and Canadian origin pigs to segregate these hogs by origin in separate finishing barns. There would be more effort required on the part of such operations to keep proper documentation of these animals so there would be a slightly higher cost for being in COOL compliance. Estimates put this cost at 25-50 cents per head as compared to the 0-10 cents per head for the other operations.

The sale of market hogs from mixed feeding operations might find the US origin hogs going to a US only slaughter operation while the Canadian origin hogs flow to a mixed origin slaughter firm or plant. Under the new rules, slaughter operations that kill both US and Canadian hogs in the same shift can identify all of the production from that day's production as Label B. Plants could have designated days for killing only Canadian hogs although such hogs would still need to carry a Label B so for scheduling purposes, it is unlikely that many such shifts will occur. We would expect that plants that are set up to slaughter hogs of mixed origin will try to have as few US origin hogs in that shift or on that kill day as possible. Presumably that product will be discounted in price as it will need to flow through to retailers that will accept Label B and the costs incurred by such retailers is well above costs for US only supply chains. Plants of mixed origin slaughter will need to segregate their production into Label A and Label B and this will require higher costs for segregation and product identification through their operations. It is estimated that costs for mixed origin packer/processors will range from as low as \$2/head to as high as \$6/head depending upon how they manage the mixed origin production.

As can be seen, there are higher costs associated with companies using mixed origin hogs in their slaughter/processing operations. An operation using mixed origin hogs could avoid some if not all of these increased costs of segregation if it could develop a customer base for the retail type products in the food service sector. Pork products moving into further processing (hams, bellies, trimmings, etc.) are not subject to the COOL regulations so over time, it is possible that a larger percentage of Canadian origin product will find uses outside of the retail sector in order to minimize COOL cost outlays.

At the retail distribution and retail store level, the costs of COOL are dramatically lower for those retailers that designate themselves as US origin (Label A) firms. Acceptance of only Label A product from their suppliers simplifies the labeling process and effectively reduces COOL costs to one of assembling documentation from suppliers indicating that the product is of US origin only. We see that cost as being a fraction of a penny per pound of fresh retail pork sold. For mixed origin retailers, there is a rather large cost associated with putting in place the tracking system and new scales that will allow for the appropriate label being put on the meat as it flows to the retail meat case. As with the retailers that have moved in this direction for beef, there are reasons other than just COOL compliance that has caused some major retailers to make the rather large investment to be able to handle multiple origin

products. Updates indicate that this cost is still similar to what was estimated in a 2007 Informa study and that cost is 4.5-6.0 cents per retail pound sold or the equivalent of \$1.65-2.00 per head.

In summary, the altered COOL rules that have now been implemented along with decisions by many in US industry to adopt US origin only pork programs has sharply reduced the supply chain costs for COOL. In the original work by Sparks conducted in 2003, COOL costs for pork were put at \$3.25-10.25/hog. These were adjusted lower in the 2007 study by Informa to \$2.15-9.50/hog with the low end of the cost range in both cases reflecting US only production systems while the higher end of the range factored in costs related to mixed origin supply chains.

For 2009, we now estimate that removal of many of the segregation issues through the adoption of full US origin supply chain configurations has dropped the cost for such systems to a rather small 25-35 cents per hog. For mixed supply chain programs, the cost for the producer is still rather limited but packer/processing and retail level costs remain only modestly back of the supply chain costs calculated earlier. It would appear as though companies within the US industry looked at the cost of segregating product and being able to use multiple Labels in their operations and decided it was too costly. Consequently, many firms have taken the path of least resistance and lowest cost which is avoiding the use of Canadian origin hogs and pork in their operations.

2. Hog System Production Allocations

In the original 2003 COOL cost analysis, the US hog and pork sector was segmented by primary hog production systems as the original COOL legislation was deemed to have significantly different cost burdens at the live animal production and slaughtering levels depending upon whether an operation was integrated or non-integrated. We have maintained this production segmentation in this updated analysis primarily to reflect production volume changes that have taken place in the past few years. We have included in Table 5 production system estimates prepared in 2007 as well as Informa's current estimates for 2009. For 2009, total commercial barrow and gilt slaughter is estimated at 109 million head with an additional 3.3 million head of sows and boars expected to move to slaughter. The comparable volumes for 2003 and 2007 were 98 million and 105.4 million respectively.

Apart from the fact that the US hog production sector has expanded in volume over the past several years, there have also been modest changes in the volume metrics in the various production systems identified. We estimate that 36 million market hogs are now produced and then slaughtered in integrated hog production and processing systems although the processing component of many of these integrated firms also procure and slaughter hogs from outside their production base (mostly on contract). There has also been continued expansion in large scale closed hog production systems which are not vertically integrated with a packing operation. At present, it is estimated that 43 million hogs fall into this production system classification which is well above volumes estimated in the 2003 study.

The third production system identified is for small to medium sized independent hog producers who also lack integration into the slaughter processing sector. Within this group would be hog operations that acquire the Canadian isowean and feeder pigs for finishing purposes; smaller scale farrow-to-finish operations and small to medium sized finishing operations that do not engage in the finishing of any Canadian pigs. Over the longer term, it is estimated that volumes in this category have declined as the industry continues to consolidate into larger units. In addition, the decline in the importation of Canadian feeder pigs for finishing has reduced projected volumes in this production segment in 2009. We estimate that 30 million head of hogs are marketed from this group of hog producers.

Table 5 Hog Production-Allocations between integrated/non integrated systems

	2003 Estimate	2007 Estimate	2009 Estimates
Integrated Hog Production and Packer/Processor System	25 million	32 million	36 million
Large Scale Closed Production System, Non-Integrated	25 million	35 million	43 million
Small independent, Non-Integrated	45 million	35 million	30 million
Non-Integrated Packer/Processor	73 million	73.4 million	73 million
Sow and Boars	3 million	3.8 million	3.3 million

It should be noted that included in the volume estimate for the small independent and non-integrated operation is the volume of Canadian finished hogs that move directly from Canada into US slaughter operations (about 1 million head). It was felt that these hogs would carry a pre-slaughter COOL cost similar to the costs born by this particular producer group (for ID, segmentation, etc.). Direct to slaughter Canadian market hogs are also included in the non-integrated packer/processor category volume so they are part of the 73 million hogs for 2009 allocated to this processor category.

3. Pork Supply Chain Aggregate Cost Allocations

In Table 6, a segment breakdown of estimated industry COOL costs is provided. The segmentation in this table adheres to the breakdown provided in Table 4 and utilizes per unit costs (\$/head or cents/lb.) to expand these unit costs to aggregate supply chain segment dollar costs. This was accomplished by applying the appropriate volume metrics to the calculation. The format of the calculations is somewhat different than those presented in the original 2003 study but we have included the 2003 calculations in Table 7 to facilitate comparisons between the two sets of cost estimates. The COOL cost estimates for 2009 are broken down

to reflect supply chain costs that would be associated with US origin only hogs and fresh pork as well as costs associated with the utilization of mixed origin hogs and fresh pork. An aggregate total is also provided.

Table 6 US Pork Industry Supply Chain Costs- Segment and Aggregate

	Segment Cost 2009 US Origin Only Mil \$	Segment Cost 2009 Mixed Origin Mil \$	Calculation Process
Integrated Hog Production and Packer/Processor System (US only)	\$0-\$3.6	Not Applicable	36 million hogs per year
Large Scale Closed Production System, Non-Integrated (US only)	\$0-\$4.3	Not Applicable	43 million head per year
Small Independent Non-Integrated Production System (US only)	\$0-\$2.0	Not Applicable	20 million head per year
Small Independent Non-Integrated Production System (Mixed Origin)	Not Applicable	\$2.5-5.0	10 million head per year
Non-Integrated (US only) Packer/Processor	\$0-\$6.1	Not Applicable	61 million head per year
Non-Integrated (Mixed Origin) Packer/Processor	Not Applicable	\$60-72	12 million head per year
Sows and Boars	Minimal	Not Applicable	
Retail Distribution and Retail Store (US only)	\$15.0	Not Applicable	2.0 billion lbs. sold @ 0.0075 cents/lb from 54.5 million hogs
Retail Distribution and Retail Store (Mixed Origin)	Not Applicable	\$90.0-120.0	2.0 billion lbs. sold @ 4.5-6.0 cents/lb from 54.5 million hogs
Sub-Total	\$15.0-\$31.0	\$152.5-\$197.0	
Supply Chain Total			\$167.5-\$228.0

COOL costs for US origin only hogs/pork is provided in Table 6 alongside supply chain costs for product that moves through the pork supply chain and is configured to meet mixed origin labeling requirements. As can be seen, much of the estimated costs for COOL in the pork sector will fall on those slaughter/processing and retail operations that elect to provide their customers with two or more of the origin labels.

First of all, it should be noted that the supply chain COOL costs for the production sector within the US is relatively small and certainly when compared to the earlier 2003 estimates (Table 7) where identification requirements were much more stringent than is the case today.

For the top three hog production system categories which account for the bulk of US hog marketings, the cost will range from near zero or very minimal levels to nearly \$10 million on the high end of the range. Since most of the hogs identified as being produced under a US only production system will merely need appropriate affidavits to reflect US origin production, the industry cost is primarily one of record keeping costs.

There will be a small portion of hogs that are produced in facilities that may or may not finish Canadian origin pigs as well as US origin pigs. In most cases, an operation that handles dual origin feeder pigs will be segregating these animals by finishing barn and if not, most certainly by pen in order to manage herd health issues as much as possible. For 2009, it is expected that about 5-5.5 million head of Canadian feeder pigs will be fed out in the US. We are assuming that roughly 10 million head of US/Canadian pigs combined will flow from such operations and these hogs will have a modestly higher COOL cost associated with more detailed record keeping and incremental costs associated with animal segmentation prior to slaughter. The producer cost for this grouping of hogs is put at \$2.5-\$5.0 million based on the unit costs identified in Table 4.

At the slaughter/processing level, there exists a fair degree of complexity in terms of identifying and allocating costs associated with COOL requirements. For the estimated 36 million head of hogs produced under integrated production systems, the costs for COOL at slaughter/processing are imbedded in the costs identified for this system in the first section of Table 6. Most of these integrated firms do slaughter hogs produced outside their operations and this slaughter volume combined with slaughter by other non-integrated packers using only US origin hogs is expected to account for another 61 million head of slaughter with costs ranging from minimal to \$6.1million.

Where costs begin to become large is for those hogs that move through slaughter operations which are configured to segregate hogs and resulting pork production by origin in order to provide their customers with product labeled A, B and/or C. For 2009, it is expected that the higher costs for doing this origin segregation will apply to an estimated 12 million head of hogs at a cost to this segment of the industry of \$60-72 million. One could argue that such added costs are prohibitive from a competitive perspective so US firms will work hard to reduce the volumes in this category as much as possible.

When moving up the supply chain to retail distribution and sales, there is also a major differential between the cost structure associated with US origin specified supply chain delivery as opposed to a mixed origin distribution of product. Based on forecast US pork production volume in 2009, yield estimates were applied to carcass level production to estimate the volume of fresh pork cuts that will be sold in total through retail. That estimate is approximately 4 billion pounds on a product weight basis. For US origin supply chains, the estimated cost per pound of product sold is only \$.0075. Based on industry interviews and Informa's knowledge of the retail meat sector, it is estimated that about half of retail outlets will or have put in place specifications that the product they receive be of US origin only. This means that about 2 billion pounds of retail fresh pork sales will carry a very low per unit cost as retailers going this route will be able to put US origin on all of their meat case

packages and only costs associated with product origin documentation will be born. Hence, the retail sector cost for US origin supply chains is only \$15 million.

Table 7 US Hog and Pork Chain COOL Costs Estimates- 2003

	\$/Head	Segment Cost (Million \$)	Calculation Process
Integrated Hog Production and Packer/Processor System	\$0.50	\$12.5	25 Million Hogs per Year
Retail Distribution and Retail Store	\$2.75		
Total Integrated System	\$3.25		
Large Scale Closed Production System, Non-Integrated	\$.75	\$18.75	25 Million Head per Year
Small Independent Non-Integrated Production System	\$1.50	\$67.5	45 Million Head per Year
Non-Integrated Packer/Processor	\$2.00-6.00	\$146-\$438	73 Million Head per Year
Retail Distribution and Retail Store	\$2.75		
Total Non-Integrated System	\$5.50-10.25		
Sows and Boars	\$2.00	\$6.0	3 Million Head per Year
Retail Distribution and Retail Store		\$263	3.5 Billion lbs. sold @ 7.5 cents/lb from 98 Million Hogs
TOTAL	\$3.25-\$10.25	\$513.75-\$805.75	

For the other half of retail fresh pork sales, retailers in this category have made the decision to provide mixed origin offerings and Informa's estimate of these costs ranges from 4.5 to 6.0 cents per pound of product sold. When applied to the estimated 2 billion pounds of product weight sold through mixed label retail outlets, the retail segment cost for this group of operators would fall in a range of \$90 million to \$120 million. When US origin only costs are added to the mixed origin cost estimates, the total industry cost burden for COOL is now estimated at \$167.5 to \$228.0 million. This compares with the 2003 cost estimates reflected in Table 7 of \$513.75 to \$805.75 million.

In summary, the cost burden for the US pork supply chain associated with COOL has declined sharply from earlier estimates. This is due to less onerous changes in the labeling requirements as well as US industry decisions as to how to configure their operations in order

to avoid as many costs as possible. Costs to the beef industry are about a half billion dollars less than originally estimated while those for the pork industry are several hundred million dollars less. There are still significant costs attributed to COOL compliance, however, and these added costs will need to be covered by beef and pork supply chain participants from cattle and hog producers right through to beef and pork consumers.