MANAGING AN BORDER THREAT: BSE AND COOL EFFECTS ON THE CANADIAN BEEF INDUSTRY
TEACHING NOTE

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Case Summary

This case considers the influence of border actions on foreign markets. The decision maker must sort out the value of increased slaughtering capacity to address threats to Canada's beef industry due to its reliance on the American demand for beef and live cattle. These threats were clearly exposed by the confirmation of a case of Bovine Spongiform Encephalopathy (BSE) in a cow slaughtered in Alberta, Canada in May of 2003. They are also part of the concerns Canadians have about Country of Origin Labeling (COOL) regulations currently being developed by the U.S. Congress. BSE threats included direct herd and human health effects, but they also included market impacts due to consumer and importer responses to health concerns. The BSE market impacts were most directly felt when the U.S. border was closed to Canadian live cattle, sheep and other ruminants in 2003. While the risk of BSE having some impact on human health is not zero, Canadian consumers have, so far, continued to consume beef and the U.S., Canada's largest beef importer, has resumed trade in Canadian beef made from young cattle within in months of the border closure for live animals. They have also recently started allowing imports of live young cattle. While the border was closed Canadian ranchers suffered major income losses from low calf prices and also saw the value of their breeding herds plummet.

While the BSE case exposed the havoc border closures can raise, the return to more regular live cattle trade between Canada and the U.S. has diminished the income concerns of producers due to BSE. COOL legislation in the U.S. is now the more likely threat to Canadian cattle producers. The costs of segregating cattle for Canada versus U.S. origin labeling could effectively close the border and will at least increase the costs of accessing U.S. markets for Canadian Producers.

This case study describes Canada's beef industry in detail. This sector is interesting as a case study for several reasons:

- Several layers of firms are involved in the supply chain from cow calf ranchers to retail beef markets.

- When processed beef was allowed into the U.S. and live cattle were not allowed, there were significant profits in the processing sector. Clarification of this point makes for an interesting discussion of the costs and price effects of trade actions.
- Concentration in the beef slaughter sector gives us an excuse to discuss market power and the challenges the supply chain may face due to this concentration.
- The uncertain nature of border trouble lets us bring up unpredictable versus predictable risks.
- The possible feasibility of differentiating new product lines for multi-species slaughter facilities and introduces the student to the challenges and opportunities of product differentiation.

The focus of this case is on the possible support of the Canadian federal government for increased beef slaughtering capacity as a response to the border threats. The tangential factors listed above allow for very good discussion of context that surrounds industry wide strategic planning.

Teaching Objectives and Possible Uses of the Case

This teaching case offers a unique combination of events that allow students to consider uncertain event strategies for policy makers, producer groups and investors. The case has downstream and upstream effects for the market chain from beef producer to beef consumer. It is also a useful trade case. The border between Canada and the U.S. has been closed periodically to trade in various products since confederation, but there is no clear way to assess the probability of the border remaining open (or closed) to any product at any time. This creates havoc for investors considering an expansion into the processing sector if it is prospering only if there is a closed border and for producers suffering from lower demand under a closed border. Should they act quickly to capture processing profits or to mitigate production losses or should they wait until the border opens and the market realigns? Unlike yield and price variations which may follow predictable distributions, events like a border closing are unpredictable. An industry might expect them to happen from time to time but have no idea about how often or how long the negative impacts might last.

In order to deal with unpredictable events, market agents and industry leaders need to look at the best the outcomes of any current strategy under various states and take actions to mitigate serious negative impacts even when the risk of that state is unknown. This case offers strategic choices currently being promoted by various agents in the Canadian beef market with respect to trade concerns and industry expansion. Although the case focuses on a policy maker, the instructor is free to consider the problem from the point of view of a cattle producer, a beef processor or a potential processing investor. Each of these agents would use different criteria to evaluate the strategies suggested by the case. These criteria are suggested below for each of the key agents in this industry. The authors are especially interested in considering an investment in a processing facility, but the case could be used for any agent in the supply chain.

Key case objectives are:

1. To provide an opportunity for students to apply strategic management tools when faced with several possible market outcomes (eg. border open or border closed) even if there is no way to ascribe probabilities to these outcomes.

2. To use trade models to understand the implications of various types of trade actions and strategic actions.

3. To expose students to the analysis of an investment with uncertain outcomes using Knight's classic definition (Knight 1921). Concerns like a border closing and trade actions need to be addressed by looking at agent welfare in each possible future outcome and considering strategies that are successful under each outcome.

4. Introduce students to product differentiation through as one of several strategies for market development.

This case can be used by students studying finance, public administration, or business management and can be easily discussed in a sixty to ninety minute class with limited preparation.

Suggested Discussion Questions

1. From the point of view of Canadian beef producers, what was the most damaging event in 2003? How would you measure this damage? How would COOL be different?

2. What has been the most recent trend in trade relations between Canada and the U.S.? How would this effect your decision to invest in beef processing in Canada? Are you dealing with uncertainty of trade conditions?

3. What kind of market options do processors face in this industry?

4. As the federal minister of agriculture, what type of strategies would you consider for this industry? Would you support an increase in slaughter capacity? Does your choice change if you represent beef processors? What if you are the president of a cattle producers association?

Analysis

In answering each of these questions the student should be encouraged to develop criteria to assess the impact different agents in the supply chain experience when a market is shocked. Various impacts are exposed in each of the first three questions and each asks you to consider the way various agents experience and measure impacts. It should also be clarified that the borders can close tomorrow or remain open for several years and the best strategies would succeed under either condition. The following are suggested answers to the discussion questions:

1. The students may have trouble sorting through the “most damaging” event without some measure. We suggest using firm profit levels as a measure. From that perspective, the most important event for producers was the actual closing of the border to live cattle and, temporarily, to beef. It is true that the BSE case triggered the border closure and may indicate some risks in terms of long run herd health costs, but the reason beef prices fell was a loss of export demand for around one and a half million head of Canadian cattle. Beef consumption in Canada has gone up so domestic responses to the BSE scare were not the problem. The few farmers that lost their herds to the Canadian Food Inspection Agency's (CFIA) testing were compensated, albeit insufficiently. The most important impact on the industry was the drastic fall in prices for cows and significant drop for calf prices when the border closed.

The clearest measure of any private firm's welfare is long term profitability. The large drop in prices led to reduced profits for live beef and other ruminant producers when the border closed. This change in profits is the best measure of the closure's impact for each part of this supply chain. The welfare of the industry can also be assessed by looking at the producer surplus lost due to the price drop and loss of demand. Students should see that the industry wide producer surplus and profits include big increases for processors.

Figure 1 is a basic three panel trade diagram in equilibrium at the price of P_T and with production for Canada and the U.S. at Q_{TrCan} and Q_{TrUS} respectively. This figure can be used to show how the closure of the border due to BSE effectively eliminated the excess demand (ED) for live cattle from U.S. processors and drove down Canadian prices for live cattle to autarky levels at P_{AuCan}. U.S. live cattle prices would have increased to P_{TAuUS}. This could be used to shift costs and then be used to show how the lowering of supply to U.S. processors likely increased beef prices in the U.S. This combination of lower Canadian live cattle prices, higher beef prices and the combination of an open border for boxed beef but closed to live cattle led to very good profits for Canadian beef processors in the short run. If the situation had persisted slaughtering capacity would have probably increased.

Figure 1. Trade in Live Cattle between Canada and the U.S. Showing Autarky Prices

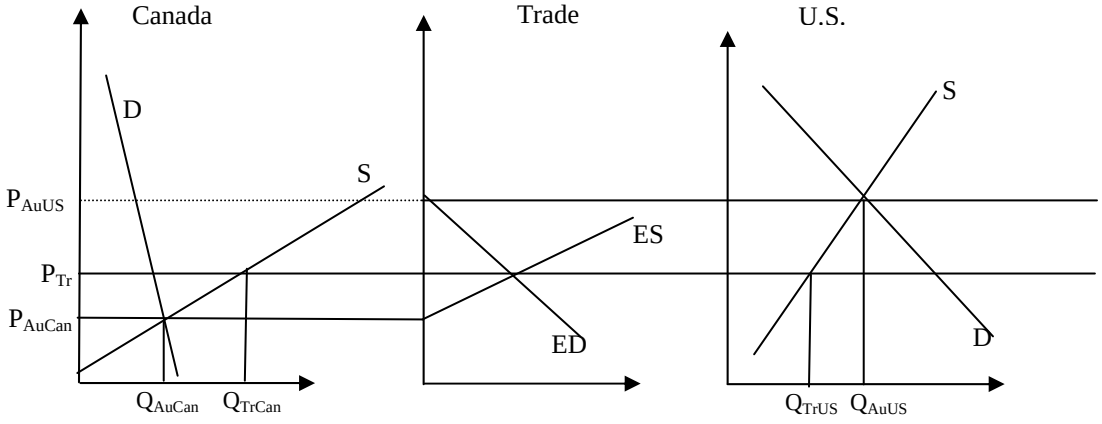


Figure 1 is a useful graph for discussing the direction of price changes, production and consumption levels under different trade regimes. Students should know that the equilibrium quantity is determined by the intersection of the ES and ED lines and is equal to the quantity exported from Canada and imported by the U.S. Students should also be informed that trade in Canada and the U.S. is a good deal more complex than this simple diagram suggests. Free trade has allowed evolving geographical markets such that the eastern beef trade is often from the U.S. in to Canada while western trade is from Canada to the U.S. Both countries also export some beef to Asian markets where trade was affected by the BSE scare.

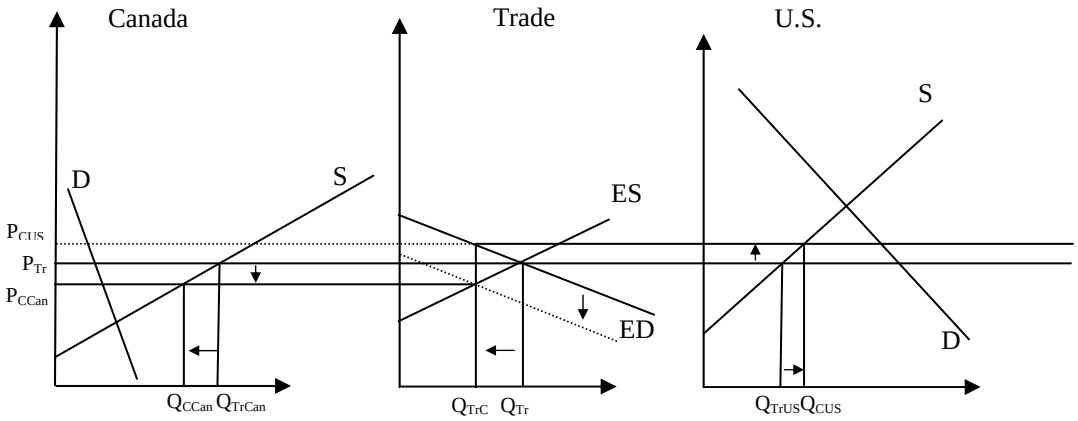
The threat of COOL is different in terms of the use of a three panel trade model. The costs of COOL act like a tax, lowering total quantity while driving up retail prices and/or lowering live cattle prices, but excess demand from the U.S. could still be part of Canada's equilibrium price. Whether this would be better for Canadian producers or final consumers than a border closure would depend on how costly COOL will be to implement and whether differences exist between those costs for differing supply chains. Although they may be paying for some new traceability costs, COOL is yet another opportunity for processors if live cattle prices fall but beef prices stay strong.

Figure 2 shows impact of a regulation like COOL in the three panel trade diagram. There are a number of transaction costs that might result from the program[a]. The trade costs faced by Canadian exporters relate to the decreased incentives for U.S. packers to procure foreign live cattle. The costs are associated with segregation , monitoring and verification costs and new administration costs. These costs are represented in Figure 2 by a shift of the excess demand curve for Canadian cattle. The costs result in a wedge between the U.S. procurement price, which increases, and the price that Canadian cattle producers receive, which goes down.

After the imposition of new costs, production for Canada and the U.S. is at Q_{CCan} and Q_{CUS} respectively. This figure can be used to show how the new costs from things like sorting for COOL effectively shift the excess demand (ED) for live cattle from U.S. processors and drives down Canadian prices for live cattle to P_{CCan}. U.S. live cattle prices would increase to P_{CUS}. The new costs lead to higher prices for U.S. Packers. Instructors may want to make some horizontal input/output graphs like discussed in chapter 2 of Penson et al, 2002, to show the effect on beef prices to U.S. consumers.

COOL, by intention, could lead to different demands for Canadian beef in the U.S. versus U.S. produced beef. How this would affect Canadian prices depends on the nature of the differentiation for U.S. consumers. We might assume they prefer U.S. made beef to Canadian unless the former is offered at a discount. If we assume linear demands and that the two beefs are simple substitutes, the effect for Canadian producers would be the same as the COOL costs – a shift in of their Excess Demand curve. The size of the shift would depend on the elasticity of substitution for Canadian beef with respect to the price of U.S. beef in the American market.

Figure 2. Trade in Live Cattle with New Labeling/Sorting Costs



Processors, who saw gains from the border closure under BSE, may not benefit as much from COOL. They will have new costs to implement COOL. However, higher costs for mixed supply chains animals born or raised in one country and processed in another, versus supply chains that keep all of the supply chain in on country could create processor gains. Rude, Iqbal and Brewin (2006) found gains for Canadian hog processors because the costs of mixed chains led to an over supply of live animals in Canada with steady demand for slaughtered pork in both Canada and the U.S.

2. Canada and the U.S. have a long history of relatively open trade. Both countries agreed to the General Agreement on Tariffs and Trade in 1948 and are members of the World Trade Organization. The 1989 Canada-U.S. Trade Agreement and the 1995 North American Free Trade Agreement both show that gains from trade have been pursued by the governments of Canada and the U.S. in partnership. The U.S. and Canada are widely viewed as free traders and they share the longest undefended border in the world. However, there have been periodic border disputes. Normally they are caused by domestic policies that arguably distort production and thus trade patterns. These disputes have usually been expressed in the form of countervailing duties. Thus the normal pattern of trade between Canada and the U.S. has been an open border with short, chaotic border disruptions.

An investor looking at the beef processing sector in Canada would see a very profitable business in recent tears. Cattle prices were depressed by the loss of the U.S. market, but the restored access to the U.S. beef market and growing Canadian demand kept beef prices relatively high. Established processors increased shifts to capture even higher profits on this price spread. There is no doubt that these firms were profitable. The question for a new investor is whether such conditions will return and how COOL would change things. Each month the border stays closed feels like a lost opportunity, but we have shown that the normal state of affairs has been an open border. Thus, an investor should consider whether they would invest in beef processing with the border open (or predominantly open). Even if they focus on non-traditional products, new Canadian plants should expect significant competition for supplies from U.S. buyers in most

years. There is also evidence that larger packing plants face very low cost of production and would be a strong competitor to any new firm looking to expand processing in Canada unless it is a technically advanced and innovative plant with very low costs.

Trade is best analyzed using the three panel diagrams presented above. Price and quantity effects are clear when both countries and both sets of demand and supply are considered. Investors need to consider the profitability of their operations under various border regimes if they are uncertain whether they will have access to export demand or import supply. Under COOL they can expect some reduction in demand and new costs for doing business in the U.S.

Suggestions are made in this case that differentiated products or services, like cull slaughtering, multi-species and specialty meats, not met by large processors, are more likely to succeed in the long run. This strategy allows new processors to prosper with either an open border or closed one as long as U.S. processors stay focused on the larger processing plants.

Beef producers considering a processing investment in the form of a new generation co-op may be in a unique position to profit in either an open or closed border state and thus less worried about a border closure. The co-op could use supply commitments from members to insure supply if the border opens and the U.S. live cattle demand returns.

The key to choosing a winning strategy under unpredictable states is to look at your profits under each state. In any investment choice regarding the Canadian processing industry, the investor should plan on a predominantly open border with periodic border closings and their investment should prosper under either state. Clarification of the impacts of the state are facilitated by looking at reasonable trade models and following policy changes.

3. The topic of product differentiation was discussed in the last section as part of the review of strategies. This introduces the whole area of product differentiation and its effect on market power, its needed supply chain coordination and the basic profitability of such a move. Clarifying the choice between large markets with economies of scale and lower production costs and smaller, differentiated markets, with premium prices, could be a good teaching opportunity.

The students should be introduced to marketing innovations in the beef supply chain like Certified Angus beef and organic beef. There are also opportunities with, cull cattle processing, multispecies and methods of killing for certain ethnic markets, Halal or Kosher beef or lamb are examples.

4. As the analysis for the first question suggests, beef producers and processors would be most concerned with their own long run profit levels and producer surplus when assessing various strategies. The minister of agriculture should consider the welfare of the producers, processors and consumers as a whole, the prudent use of tax revenues and possible herd and human health impacts. An astute student might see that Canada's abundance of land and live cattle will force a reliance on good border relations. Some Canadian producers have suggested a forced cull of the beef herd or introducing some regulated form of supply management.

Forced Cull. Assuming some level of government compensation, beef producers may be better off after a forced cull. When the border closed they suffered an immediate drop in the value of their breeding livestock. If government compensation is greater than the current value of this breeding livestock, producers gain. If it is less, they lose. Processors would definitely lose under this option as the reduction in the herd would lower supply and drive up input costs for cattle. This would also lead to lower beef supplies at a higher price to consumers.

Supply Management. Beef producers would be better off under supply management as long as there was not an open auction for beef supply quota. As most policy texts show, supply management through a quota offers big benefits to anyone granted quota rights at low or no cost, but future producers pay so much for the quota that it yields no benefit in higher income. Quota systems also lower overall welfare because the net gains in producer surplus are not as high as the losses in consumer surplus. Processors and consumers end up paying much more for lower quantities of live cattle and beef and their loss is more than producer's gain unless the demand is perfectly inelastic.

Coordination of Regulation. One of the major weaknesses exposed by the BSE border closure was a regulatory one. When Canada and the U.S. agreed to the CTA and NAFTA it fostered even more integration into the North American Beef market. Sparling and Caswell (2006) argue for the importance of regulatory coordination in integrated markets. As long as she could meet with U.S. regulators, this should always be part of the Minister's strategy. Free trade without regulatory "fairness" is not really free trade.

The Minister's decision

We now consider the response to the border threat that was the clear focus of the case.

An Expansion in Processing. As we have discussed, the current Canadian beef processing sector is doing quite well and an industry making excessive profits normally attracts more firms and investors leading to expansion. The Canadian beef processing industry is no different. Producer groups in Alberta and Manitoba have already made announcements that they are planning to build new processing plants. Producer groups may have been in the best position for this investment, because the threat to the processing industry of a more open birder and increased demand for cull cows from the U.S. would be a benefit to producers.

In analyzing these effects the standard trade model would be helpful. Increasing slaughter capacity in Canada shifts the demand curve in the live cattle market to the right, increasing quantities and prices for producers. In the processed beef market this new capacity shifts total supply to the right lowering beef prices while increasing quantities supplied.

As discussed in the analysis for processors in the questions above, the normal investor should be wary that the border would open fully. This would increase the costs of cattle as inputs and lower overall profits. If a proposed beef processing plant would be profitable even with

an open border, then it would be good investment as periodic border closures also seem likely. Producers who are not familiar with all of the details of meat processing including market share, market penetration into the retail sector and product differentiation should be cautious about getting into beef processing. This goes for the minister too. Although an expansion in processing would solve some short term problems, subsidizing a plant that would lose money under a more open border would be a poor use of government dollars.

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[a] In the U.S. producers will also face higher costs associated with traceability. These costs would create another wedge were producers get less returns and consumers get higher prices, effectively shifting the U.S. domestic demand down – causing the same basic trade effect as depicted.