

Role and Impact of Renewed Canada-US Trade in Dairy Heifers and Dairy Breeding Stock

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Introduction

Under the current BSE-influenced trade environment, Canada-US trade in dairy cows and replacement heifers has ceased. This stands in sharp contrast to trends in recent years in which Canadian exports of dairy breeding stock to the US increased markedly in both volume and relative value. This trend ended abruptly with the first Canadian case of BSE in May, 2003.

The US dairy industry has been forced to rely on US dairy replacements, and Canadian exporters of dairy heifers have seen their markets curtailed. The USDA has recently announced a process that could result in the Canada-US border reopening to trade in live cattle over 30 months of age, and presumably to Canadian replacement heifers. This process is still evolving.

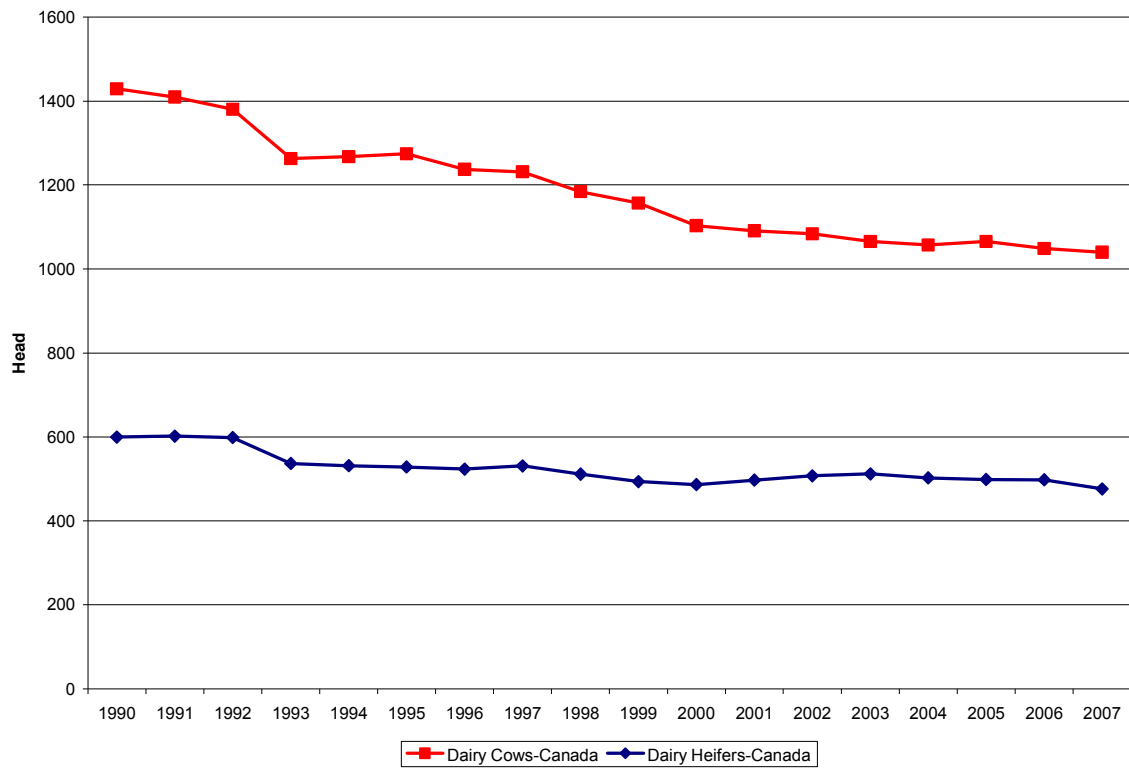
Given that the border has been closed to trade for almost four years now, the specific impact of the border reopening for dairy heifers and breeding animals on the North American market in dairy cows and replacement heifers is uncertain. The purpose of this study was to consider the demographics and past trade flows of female dairy animals in the US and Canadian dairy industries, and to provide an economic analysis of the impact of the border reopening to dairy cattle trade.

Dairy Cow and Heifer Demographics

Statistics Canada defines dairy cows as female dairy animals that have had a calf; dairy heifers are reported as female dairy animals over one year of age that have not calved. The Canadian dairy cow herd has been stable at just over 1 million head and the heifer inventory as of January 1, 2007 is 476,000 head (see Figure 1). The structure of Canadian dairy heifer inventories is such that heifer calves are born on dairy farms; following birth, they can remain on dairy farms, they can be moved to specialized dairy heifer raisers, or they can be moved into beef feedlots operated as stand-alone enterprises or as mixed dairy and beef farms. In Ontario and Quebec, specialized dairy heifer raisers were the primary suppliers to the export trade. The general upward trend in dairy heifer inventories relative to dairy cows in Figure 1 suggests that relatively more heifers have been raised as specialized dairy replacements for the domestic and US market, rather than moving through veal and feedlot channels.

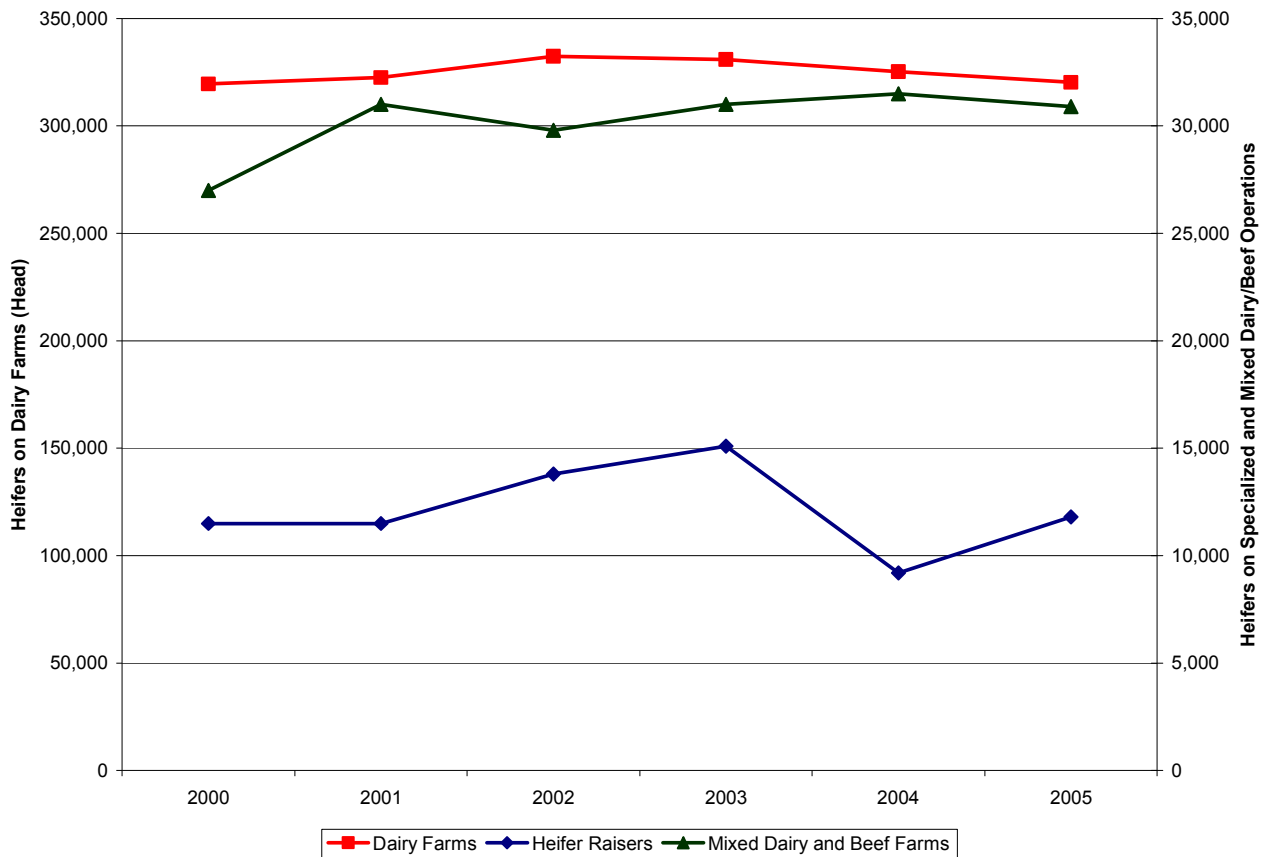
Figure 2 below presents dairy heifer inventories in Ontario and Quebec, according to the structure of holdings. Prior to 2003, custom heifer raisers had been sharply increasing inventories of dairy heifers; as of the January 1, 2004, their inventories fell precipitously. The loss in inventories held by heifer raisers was coincident with increased holdings by mixed dairy and beef farms, (presumably for feedlot finishing), some increased heifer holdings on Ontario dairy farms, and a general reduction in Quebec dairy farms' heifer holdings. As the inventory of heifers held by specialized heifer raisers declined, many

Figure 1 Canadian Dairy Cow and Heifer Inventory, January 1st



Source: Statistics Canada

Figure 2 Dairy Heifer Inventories in Ontario and Quebec, According to Farm Type



Source: Statistics Canada



of them were driven out of the business. Of the heifer raisers in Ontario reporting dairy heifers in 2003, less than half were still reporting heifers in 2004. This suggests that dairy heifer raisers were badly injured by the border closure.

Demographics of the US Dairy Herd

The US dairy herd has declined in size over time; however, there are sharp regional differences (see Figure 3). There are about 9 million dairy cows in the US, down from almost 10 million in 1990. The West, Upper Midwest, and East are the regions with the largest number of cows. The pattern of a declining number of cows is consistent regionally, with the greatest decline in the Southeast. The clear exception to this trend is the West, which has been expanding rapidly in dairy since 1990, and to some extent the South Central region, which has also been increasing.

The US dairy heifer inventory experienced a decline in the early 2000's, compared to the early 1990's, but has firmed in recent years (see Figure 4). The current US inventory is just under 4.3 million head of dairy heifers, up from almost 4.2 million in 1990. However, as noted with the dairy cow herd, there are distinct regional trends. The heifer inventory in the West is up markedly to over 1.3 million head from around 850,000 in the early 1990's. Heifer inventories in the Upper Midwest and East are essentially stable. Thus, on a relative basis, the US heifer inventory has grown relative to the dairy cow inventory, in the midst of trends in declining cow and heifer inventories.

Historic Canada-US Trade in Dairy Heifers

Table 1 below presents the annual volume of dairy cattle imports to the US from Canada. The table shows that US imports from Canada grew steadily from 2000 until 2003 to exceed 65,000 head annually. The value of Canadian exports has increased at a much faster rate than the volume of cattle themselves, increasing by almost 50% between 2000 and 2002. The sharp drop in sales volume and value in 2003 reflects the border closure in May, 2003.

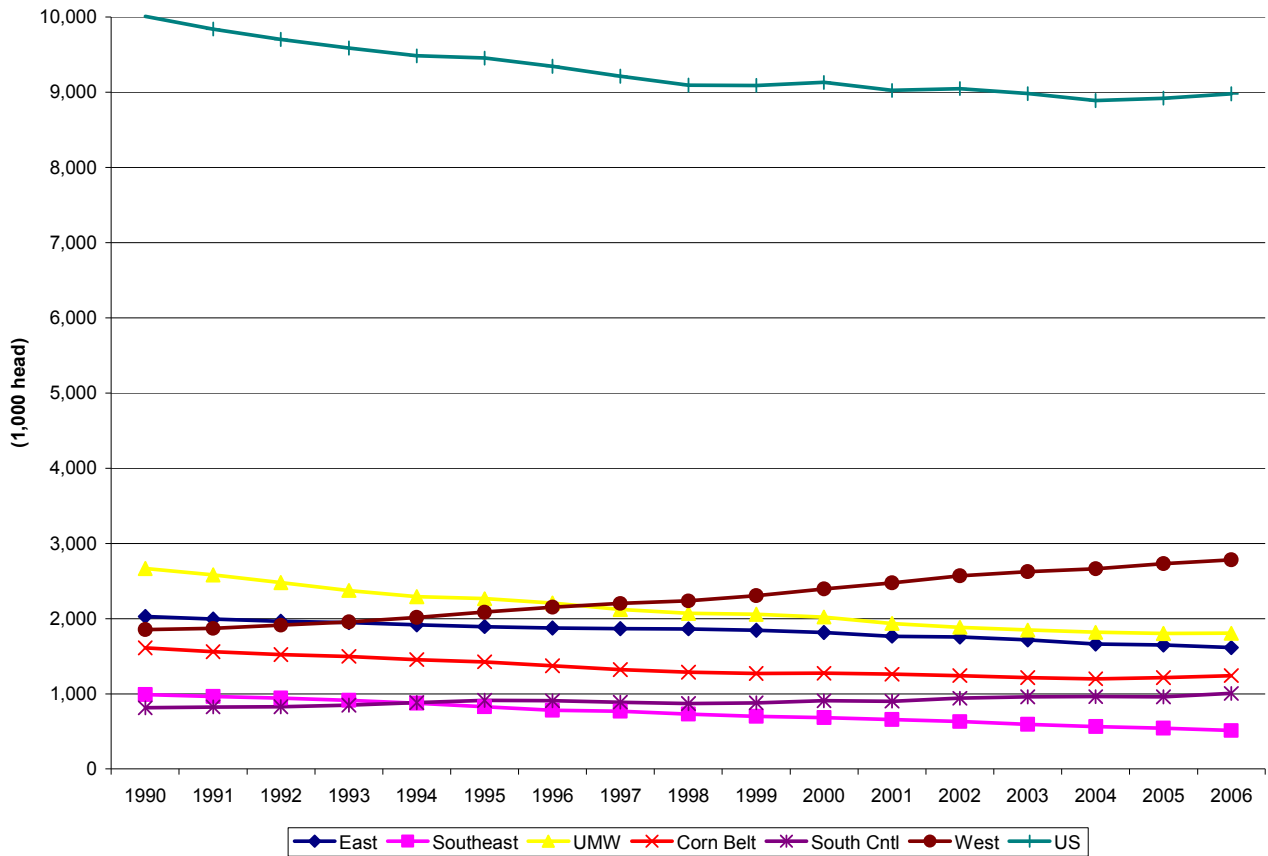
Table 1 US Imports of Live Canadian Dairy Animals, Head

	Total Heifers and Cows	Total Bulls Head	Total US Dairy Cattle Imports from Canada	Value of Trade (Canadian dollars)
2000	61,244	339	61,583	\$93,333,688
2001	63,458	742	64,200	\$122,947,639
2002	64,354	800	65,154	\$133,646,580
2003*	27,074	194	27,268	\$45,234,999

* Reflects trade from January 2003-May 20, 2003. Border closure prevented trade after this period.

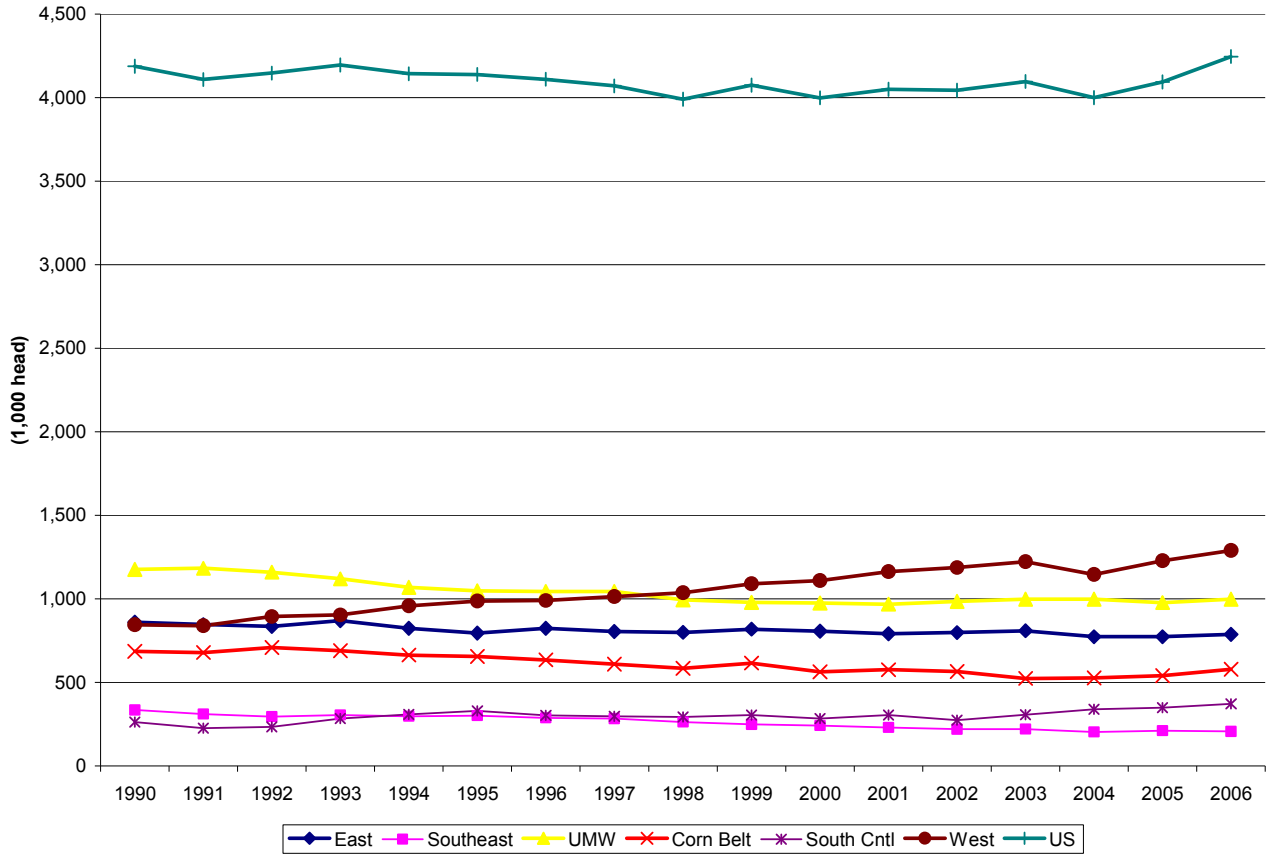
Source: USDA APHIS and Statistics Canada TIERS

Figure 3 US Dairy Cow Inventory



Source: USDA

Figure 4 Dairy Heifer Inventory, US and Regions



Source: USDA

Dairy Heifer Demand

The demand for dairy replacement heifers derives from culling and from dairy expansions. Culls are manifested as cow slaughter, cow resale, and mortalities. In the case of Canada and its supply-managed market, the demand from dairy expansions is limited by production quotas, so culling rates can be used as a guide in interpreting aggregate replacement heifer demand. Table 2 below presents Dairy Herd Improvement cull data used to interpret the Canadian demand for Canadian replacement heifers. The table shows that Canadian cull rates have increased somewhat sharply since 2003, and that the implied domestic consumption rate has increased concomitantly. Overall, the table suggests that, based on data since 2000, an expected 90% of Canadian dairy heifers are required as replacements in the Canadian dairy industry.

Table 2 Canadian Cull Rate and Implied Domestic Heifer Consumption, 2000-2007

	Dairy Heifer Inventory (Thousand)	Dairy Cow Inventory (Thousand)	Cull Rate*	Domestic Heifer Consumption (Thousand)	Implied Domestic Consumption Rate
2000	486.5	1,103.4	39%	425.6	87%
2001	497.5	1,091.0	36%	394.4	79%
2002	507.5	1,083.9	39%	419.6	83%
2003	512.0	1,065.3	38%	406.5	79%
2004	502.8	1,056.7	45%	476.3	95%
2005	498.6	1,065.0	48%	507.1	102%
2006	497.7	1,048.6	-		
2007	476.3	1,040.1	-		
Weighted Average					90%

* Source: CanWest DHI, Ontario averages.

Table 3 reports US dairy cow slaughter in US federally inspected establishments, and the implied estimate of dairy cow cull. The cow slaughter has run between 2.3 million and 2.9 million head, or 25%-32% of the US dairy cow inventory. This is a more conservative estimate of cull than the Canadian data reported in Table 2¹. The US cull data are also influenced by the US CWT (Cooperatives Working Together) program. CWT's goal was to retire dairy cows in order to yield a reduction in milk production. Through the program, 32,724 head of cattle were retired from July 2003-June 2004, 50,478 were retired in 2004-05, and a further 64,050 were retired in 2005-06. The program has been reauthorized for 2007.

The implications of the above are the following. First, the Canadian dairy heifer inventory is relatively fixed according to the dairy cow herd, which is itself relatively fixed due to the supply management system used in Canadian milk marketing. Second, while the Canadian

¹ The US cull data does not account for dairy cow slaughter in plants that are not federally inspected, or mortalities and selective culls that are sold to other producers (as does the Canadian cull data above).

Table 3 US Dairy Cow Slaughter and Implied Cull Rate

	US Cow Inventory	US Dairy Cow Slaughter[*]	Implied Cull Rate^{**}
2000	9,183,000	2,631,000	28.7%
2001	9,172,000	2,582,000	28.2%
2002	9,106,000	2,607,000	28.6%
2003	9,142,000	2,860,000	31.3%
2004	8,990,000	2,363,000	26.3%
2005	9,005,000	2,252,000	25.0%
2006	9,063,000	2,353,000	26.0%
2007	9,129,000		

Source: USDA

^{*} in Federally Inspected Plants

^{**} Exclusive of mortalities and culls that are not slaughtered

heifer inventory is stable, the structure of heifer ownership changed following the 2003 border closure, with fewer heifers owned by specialized heifer raisers and relatively more being held on dairy farms and mixed dairy/beef operations. It appears that many of the specialized dairy heifer raisers in Canada have exited the industry.

US imports of dairy heifers had ranged in excess of 65,000 head per year prior to the border closure in May of 2003. US demand for heifer replacements derives from dairy expansions and culling, the latter component of which has been markedly influenced by the CWT program. Finally, based on historic Canadian cull rates, almost 80% of Canadian dairy heifers are needed as replacements in the Canadian market. The remaining 20% (just over 100,000 head) supply the Canadian veal market, are moved into Canadian feedlots for finishing, or could be available to the export trade.

Thus, at a structural level, Canadian heifers are fixed in supply with a relatively small amount eligible for export (recently around 10%). US demand for replacement heifers is proportional to the dairy cow slaughter and herd expansions. This demand has been augmented by additional slaughter under the CWT program.

Consultations with the US Dairy Industry

To understand the opinions of the US dairy industry related to the border closure, a mail survey was undertaken in the late spring of 2005 addressed to U.S. livestock dealers, auction houses and producers. A total of 84 questionnaires were mailed, resulting in a 15% response rate. Many respondents' trading activity focused on domestic markets only, even before the BSE in N. America. Therefore, in order to obtain a more representative sample of the US acquainted with imported Canadian heifers, another round of mail surveys was sent out in early September, 2005. The 32 additional questionnaires to producers and dealers who

traded internationally prior to the border closure resulted in a 25% response rate. In addition to the mail surveys, telephone interviews were also conducted.

Of the useable responses, US dairy farmers comprised 56% and livestock dealers in the US formed 44%. Both producers and dealers primarily handled commercial dairy cows and heifers, but about 1/3 of the respondents also dealt with purebred dairy cattle, slaughter cattle and calves. The average imported volume by respondent showed a wide range, running from as low as 15 to as high as 3,000 head per year. The respondents indicated that the highest volume was imported during the 1999-2001-time period, while the lowest number of animals entered the country between 1990 and 1992.

On a scale 1 to 5 (1 lowest, 5 highest) the importance of the animals' genetic quality ranked 4.2, which shows that both dealers and producers put high emphasis on the quality of the replacement animals. There was a high satisfaction with the genetic quality of Canadian animals.

As far as recommendations to government authorities regarding the resumption of trade in dairy cows and heifers, the majority of the respondents believed that putting a cattle tracking system in place would help to overcome the problem. A smaller proportion of the producers (37%) believed that the safest resolution would be to keep the border closed to imported heifers from Canada. The dealers were more unanimous with their answer regarding the border re-opening, however their responses differed somewhat in the method of achieving the most efficient tracking system. Some recommended a point of origin identification, while some suggest putting a tariff on imported dairy cattle to pay for the tracking costs. Another respondent was for mandatory testing as no health papers are requested for movement between provinces in Canada.

Consultations with the Canadian Dairy Heifer Segment

To understand the current status of conditions facing former dairy heifer exporters, structured interviews were solicited with 14 of the most significant exporting and dairy cattle handling organizations in Canada. The interview followed a formatted survey, which was sent out to respondents in advance. Contact was successfully made with 10 of these firms, located in Ontario, Quebec and western Canada. Two of the firms contacted were strictly livestock dealers and eight described their activities as dairy producers and dealers. The organizations contacted generally handled both purebred and commercial cattle, with two firms handling strictly commercial cattle. Two of the firms had a cattle import operation in addition to exporting, and three firms had a significant domestic sales business in addition to exports. The balance of firms was strictly exporters. The pre-May 2003 annual export volumes reported ranged between 10 head and over 18,000, per respondent with most in the range of 2000-5000 head. All had exports to the US, with 5 reporting exports to Mexico. On a five point scale, most exporters ranked genetic quality of animals as either a 4 or 5, indicating that genetic quality was an important attribute to export customers.

When asked what they had heard from industry peers regarding the border closure issue, almost all respondents indicated that the Canadian cattle export industry is hanging by a thread financially. Indeed, it appears that many are simply out of business. Some described how they and others had re-oriented their businesses to hold on to dairy heifers in a shift from cattle dealer to dairy farmer. One respondent indicated that his contacts in the US, mostly large herds in Wisconsin and California, desperately wanted the border open to supply needed heifer replacements.

Based on the mention made by respondents of the decline suffered by heifer raisers, an interview was conducted with a major heifer raiser and executive member of an Ontario dairy heifer raisers' association. This individual indicated the Ontario Holstein Heifer Raisers' Association had 103 members as of May 2003, and that as of today only 20 members remain. It is believed that 350-400 individuals were supplying dairy heifers from Ontario in the spring of 2003 with some exporting directly to dairy operations in the US, and others through dealers.

In summary, the consultations showed that prior to May, 2003 trade in dairy heifers between the US and Canada was important to the dairy industries in both countries. The adjustment that has occurred since the prohibition on trade has been significant on the Canadian side with many of the former exporters exiting the industry. Much less adjustment has occurred in the US, with significant residual demand left unfilled.

Empirical Impact of Imports from Canada on US Dairy Replacement Heifer Prices

To test the empirical impact of US imports of Canadian dairy cattle on the US dairy industry, statistical analyses were conducted relating US dairy heifer prices to a variety of dairy price and cost factors, including imports from Canada. A set of statistical regression procedures were developed in which key dependent variables (US dairy heifer prices and US dairy heifer imports) were regressed on the following independent variables:

- US dairy milk-feed ratio
- US dairy cow slaughter
- US dairy herd inventory
- Canada-US currency exchange rate

Figures 5 to 8 below illustrate patterns in the data over the period 1995-2003, with the 2003 data reflecting exports up to May prior to the border closure. Figure 5 presents US dairy heifer prices relative to the volume of dairy cattle imports from Canada. The figure shows what would appear to be a weak positive relationship between US dairy heifer prices and the level of imports from Canada. Indeed, in 2003 when US border was closed to imports from Canada, US dairy heifer prices decreased. Figure 6 presents the pattern of US imports of Canadian dairy cattle relative to the US milk-feed price ratio, which measures the US price of milk (in \$/cwt) relative to the cost of feed required to produce 1 cwt of milk. The figure suggests a strong, positive relationship between the milk-feed ratio and the level of cattle imports from Canada.

Figure 7 considers US milk prices relative to dairy cattle imports from Canada. It is thus a component of the pattern observed in Figure 6, since the milk price is the numerator of the milk-feed price ratio. The figure suggests little relationship between milk prices and imports. For example, periods of high milk prices in the US have seen extremely variable cattle import levels. In 1996, when imports of Canadian cattle were about 11,800 head, high milk prices of well over \$14/cwt were experienced; in 1999, when imports of Canadian cattle were about 69,000 head, high milk prices of well over \$14/cwt were also experienced. Thus little relationship is evident.

Figure 8 presents trends in US imports of Canadian dairy cattle relative to the Canada-US currency exchange rate. Throughout much of the period presented in the figure, the Canadian dollar was weakening relative to the US dollar, which gave US buyers relatively more purchasing power in importing Canadian cattle. The figure shows that US imports appear to have been strongly influenced by the currency exchange rate. Clearly, changes in exchange rates did not influence the closure of the border to trade; however, since exchange rates appear to have been an important driver of US demand when trade was occurring, the much stronger Canadian dollar that exists today suggests that US demand for dairy heifers would be weak relative to history if trade was allowed to resume.

Empirical tests confirm the observations illustrated in the figures². In particular, US imports of Canadian dairy cattle were found to have no statistically significant effect upon U.S. heifer prices or the US milk price.

² Full statistical results can be available in the technical paper *Role and Impact of Renewed US-Canada Trade in Dairy Heifers and Dairy Breeding Stock* accessible through the George Morris Centre website www.georgemorris.org

Figure 5 US Dairy Heifer Prices vs. Imports of Canadian Dairy Cattle

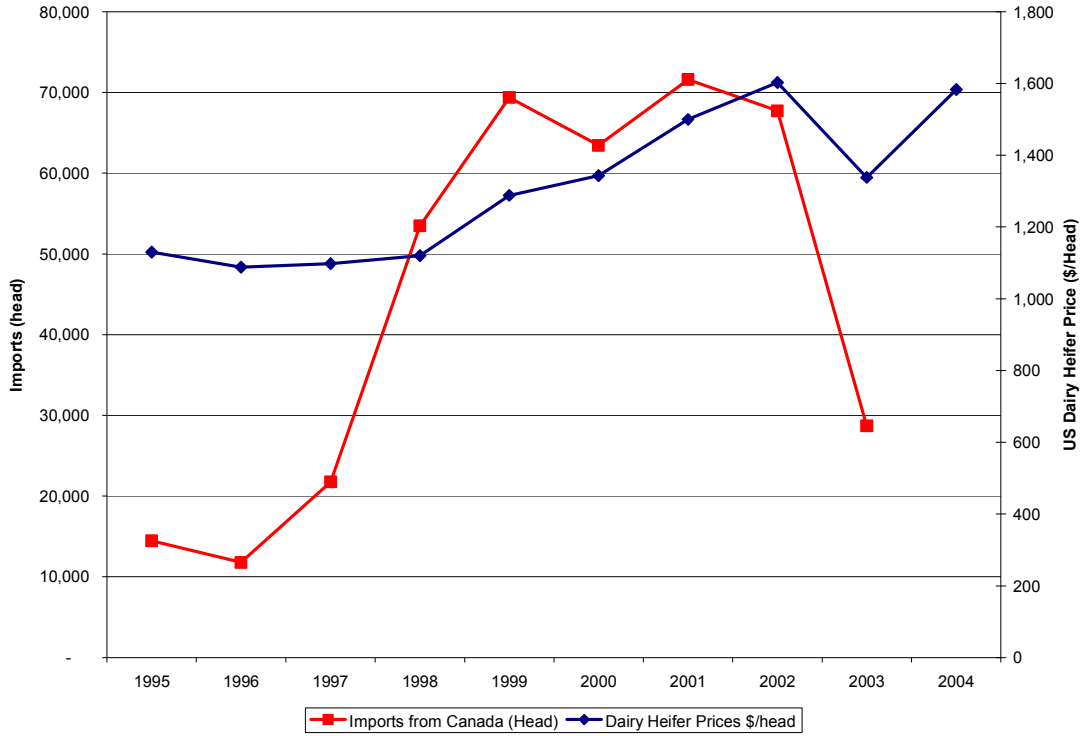


Figure 6 Imports of Canadian Dairy Cattle vs. US Milk-Feed Price Ratio

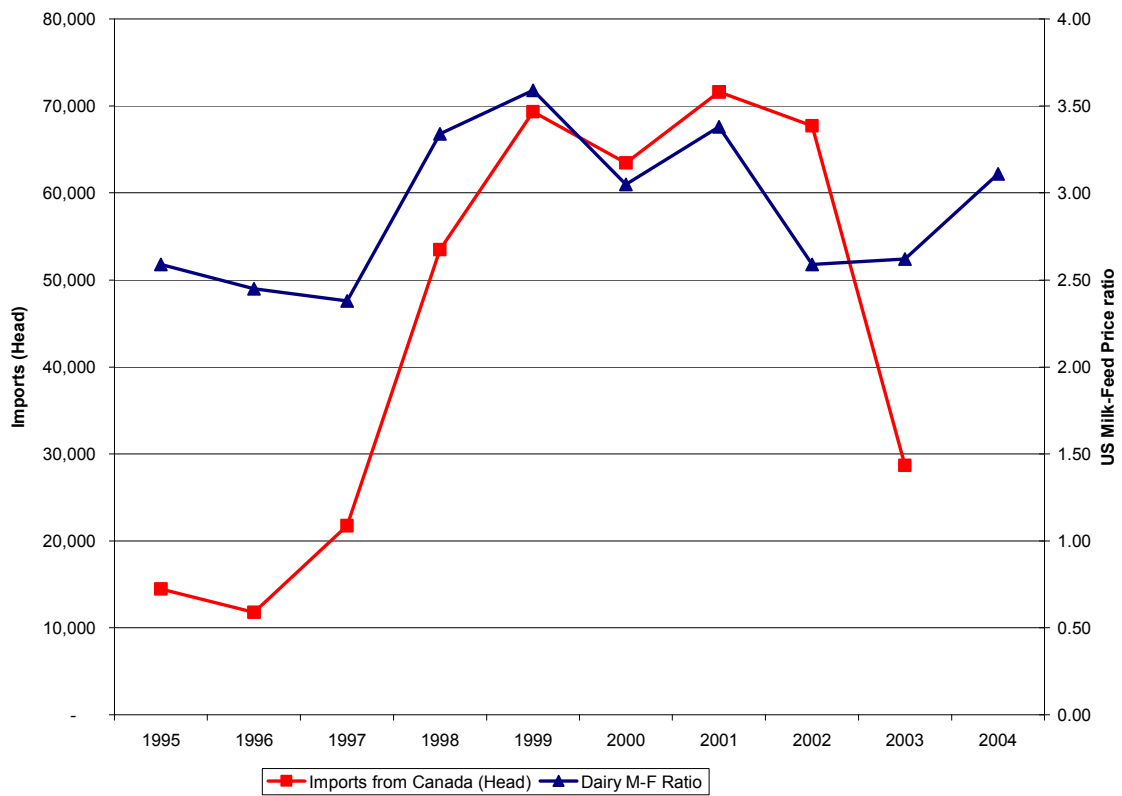


Figure 7 Imports of Canadian Dairy Cattle vs. US Milk Prices



Figure 8 Imports of Canadian Dairy Cattle vs. US-Canada Currency Exchange Rate



Conclusions and Looking Forward

The view that emerges from the analysis is of a market for dairy heifers that was essentially North American in scale, and one in which US-driven demand for heifers resulted in imports from Canada. Discussions with market participants on both sides of the border indicate that quality of Canadian cattle was an element to this trade; however, basic supply and demand and the currency exchange rate were of greater importance. Prior to May, 2003 it appears that the North American dairy heifer market was operating as one might expect, with Canada serving as a residual supplier of dairy replacements either when a shortage existed, when a preference for premium quality existed, or when the combination of price and exchange rates favored importation from the perspective of US dairy producers and livestock dealers. The data suggest that this trade was important, but practically less material than other factors influencing US dairy markets.

The situation is markedly different today. After a four year prohibition on trade, it appears that the firms formerly involved in Canadian dairy cattle exports are largely out of business or have shifted into other ventures. The productive capacity and infrastructure that facilitated trade in dairy heifers has declined sharply. Just as importantly, the currency exchange rate conditions that both Canadians and Americans suggested were critical to trade flows are entirely different than prior to 2003.

Given these factors, discussions on both sides of the border suggest that even if the border were opened to trade tomorrow, some time would be required for adjustment to a resumption in trade, and it is entirely unclear (and indeed unlikely) that the trade would resume at its previous levels. Thus it is likely, at least initially, that trade volumes would be well below pre-2003 levels if the border were opened in the immediate future.

In the interim, the US dairy industry must grow without access to Canadian replacement heifers, and Canadian exporters will continue to languish. Perhaps the most positive step that could be taken at this point is for an expedited, transparent process to develop rules for reopening the border to trade in cattle over thirty months of age and for breeding stock. A process conducted in a transparent fashion with clear and appropriate rules would go a long way in assuring the dairy heifer exporters and their US customers in making future investments in facilities, and commitments to each other. As of now, no basis exists for either side to make expectations regarding future trade in dairy heifers.