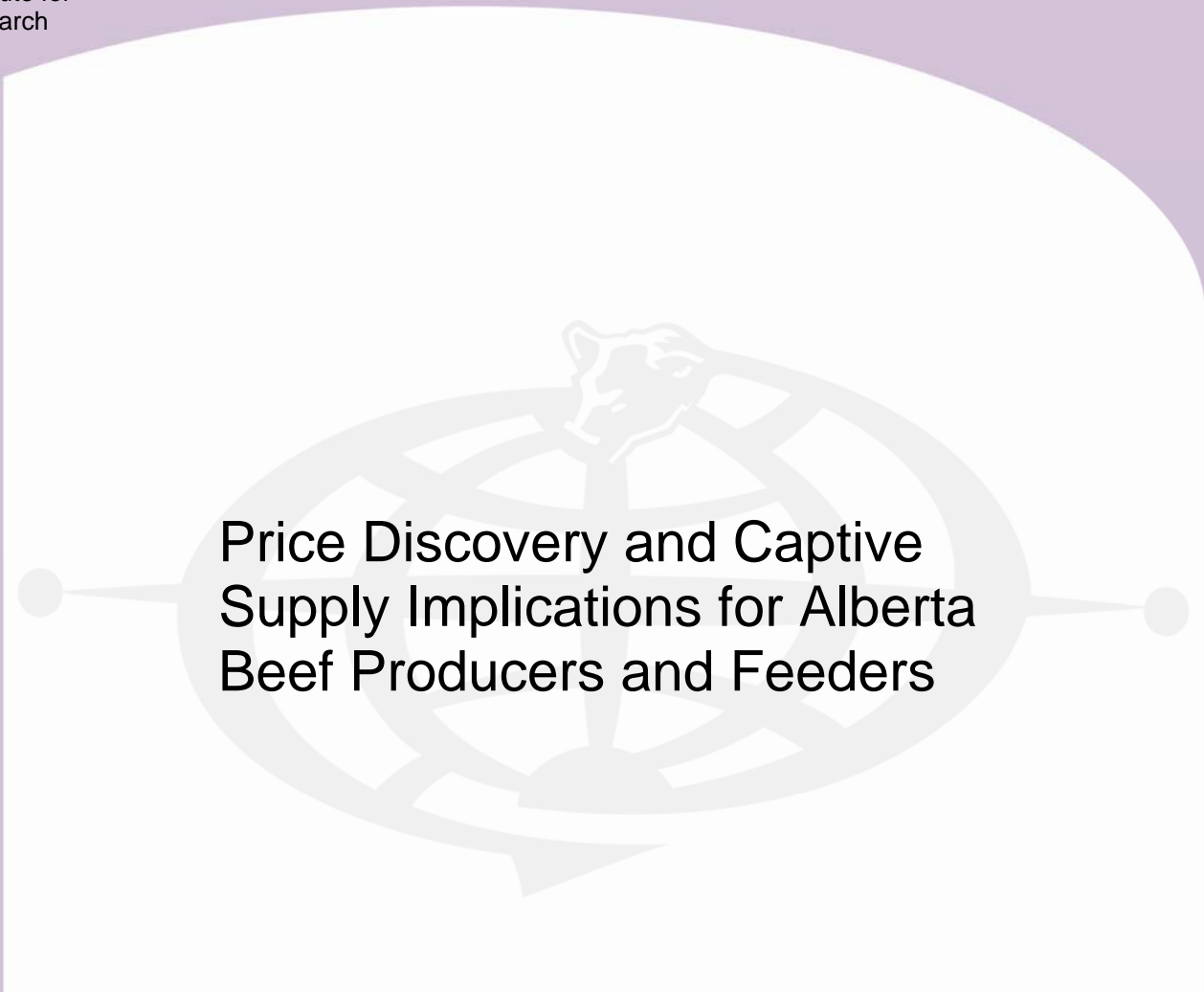




North American Institute for
Beef Economic Research



Price Discovery and Captive Supply Implications for Alberta Beef Producers and Feeders

The source of
information,
analysis, and
opinion on economic
issues of importance
to the North
American beef
industry.

Ted C. Schroeder, Professor
Kansas State University
tcs@ksu.edu

Clement E. Ward, Professor & Extension Economist
Oklahoma State University
clement.ward@okstate.edu

Executive Summary and Recommendations

Concerns about potential impacts of captive supply on fed cattle prices have been present for several years in both Canada and the US. In Canada, the magnitude of concern escalated during closure of the US border to fed cattle trade (May 2003 to July 2005) and has remained at an elevated level. Many producers in both Canada and the US argue that presence of captive supplies results in lower cash fed cattle prices. These concerns have motivated policy proposals targeted toward controlling how fed cattle can be marketed and who can own and feed cattle. However, captive supply arrangements evolved out of economic incentives of cattle producers and beef packers to engage in new business arrangements. Therefore, policies that may curtail such practices are met with considerable opposition by those who enjoy direct benefits from these arrangements. This study was designed to assist Alberta Beef Producers in their assessment of captive supplies and possible action paths. We summarize what we know about the impacts of captive supply on fed cattle markets and identify market information and research needs related to fed cattle markets and captive supply in Canada.

The impact of captive supplies in the US fed cattle market has been investigated in several published research studies. Results generally confirm a statistically significant negative relationship between captive supply levels and cash fed cattle transaction prices. However, these studies also consistently find very small magnitudes of economic impact of captive supplies on cash fed cattle prices. Furthermore, a sizeable body of literature identifies a variety of benefits associated with captive supplies for both cattle producers and beef packers. Benefits include things such as reduced costs, opportunities for quality premiums, and market access/plant utilization assurances.

The published empirical research regarding captive supply impacts on fed cattle markets have been completed in US fed cattle markets using US data. As with any empirical work, results are sensitive to market fundamentals, levels and mixtures of captive supply, market structure, and related market conditions. Our assessment is that findings from US studies are generally applicable to Canada, but important differences in the markets also make the findings of past research not completely applicable. In particular, especially when the US border is closed, captive supplies could place increased downward pressure on Canadian cash fed cattle prices. However, this is also the time when those who have marketing agreements likely garner the most benefit from a marketing agreement or contract with a packer in terms of assured market access.

Captive supply levels present in Canada are greater now than during the time most past studies in the US were completed. Recently captive supplies have comprised about 50-60% of total reported sales in Canada. This could suggest greater impacts of captive supply in Canada on cash fed cattle market prices than found in previous work, especially if the US border is closed to fed cattle trade, but how much greater is uncertain. Furthermore, packer-owned cattle feeding tends to be more common in Canada than in the US, ranging from 15-23% recently (compared to about 10% or less in the US). Packer-owned cattle might have different impacts on cash fed cattle transaction prices than cattle secured under marketing agreements. This is because packer-owned cattle could be more easily used strategically by packers since the packer has total control over delivery timing.

In contrast to packer-owned cattle, for cattle under marketing agreements delivery timing (the week of delivery) is at the discretion of the cattle feeder. In our assessment of the Canadian fed cattle markets, we did not find evidence that packer-owned cattle were being used strategically to depress cash market fed cattle prices (but an empirical test of this was beyond the scope of this study). Instead packer fed cattle appeared to be used recently to provide a relatively steady flow of cattle to the plant. Another slant to this issue is that several cattle feeders we visited with indicated that packer feeding of cattle increased feeder cattle prices relative to what they would be if packers were not in that market. The issue of packer feeding deserves on-going assessment and industry surveillance because potential exists for packers to use packer-owned cattle (and perhaps to some extent, other captive supplies) for leverage in cash market fed cattle purchases. Thus, level and variability of packer-owned

cattle feeding and associated price impacts deserve empirical analyses.

Based on our research for this study we offer a few generalizations regarding captive supply in Canada:

- Negative cash market effects are likely to increase with an increase in proportion of captive supplies (especially packer-owned fed cattle) to total harvested fed cattle, giving buyers increased opportunities to use captive supplies as a leveraging tool,
- Negative cash market effects from captive supplies are likely to increase with an increase in the week-to-week variability of captive supplies, giving buyers increased opportunities, or the appearance, of using captive supplies as a leveraging tool.
- Negative cash market effects from captive supplies are likely to be associated with a specific type of pre-committed supply and specific firm if key buyers tend to rely on a single, respective type of captive supply method consistently; e.g. one buyer primarily using packer ownership of cattle and one primarily using contracts.
- Negative cash market effects from captive supplies are likely to increase as buyer market structure becomes increasingly concentrated, as when a major market intervention occurs such as the border closing. However, this is also when the benefits are greatest for producers involved in marketing agreements with packers.

Despite potential negative price impacts, it is important to recognize there are clearly both identified benefits and drawbacks for cattle producers associated with captive supplies. As such tradeoffs exist for any potential policy action regarding captive supplies. Quantification of **net and differential impacts** of various captive supply methods is necessary before policies that might regulate these activities can be adequately assessed. Without doubt, legislation that somehow controls or limits who can own and feed cattle or how cattle can be marketed will be detrimental to at least some cattle producers and other beef industry participants.

Most marketing agreement base prices are tied to plant-average cash market fed cattle prices. When cash fed cattle markets become thinly traded, as they have during some weeks in Canada, this can result in making it easier for packers to influence the plant-average price with a relatively small number of cash market fed cattle purchases. Comparing the plant average price to a CanFax price quote as a check of whether the base is reflective of market conditions is useful. However, the packer's own prices paid for cash cattle (i.e., the plant-average price) is part of the CanFax price quote so one is somewhat comparing the packer's price to itself when comparing it to the CanFax price. This may support reasons for mandatory price reporting in Canada to increase the confidence that cash price summary market information is representative. Further support for mandatory price reporting is to increase information and reliability regarding types and levels of captive supply fed cattle marketings each week. Considerable work is required regarding the details of how mandatory price reporting would work in Canada. For example, what and how data would be collected, what and how it would be reported, whether or not exported cattle would be included, cost, funding, and responsible organization, etc. However, we do not expect mandatory price reporting, if enacted, to increase fed cattle price by any noticeable amount.

Fed cattle prices in Canada have experienced considerable volatility in recent times and relatively predictable historical relationships between Canada and US cash fed cattle prices have become highly variable. Several reasons might be hypothesized for this reduced market integration between Canada and US fed cattle markets. However, a thorough understanding and quantification of the determinants of, and dynamics associated with these price relationships is critical to understanding the relevant geographic market for fed cattle which has implications for price competitiveness and for monitoring fed cattle prices in Canada. We recommend formal research into the cash-to-cash basis levels between Canada and US fed cattle markets. In addition, development of an on-going market or industry economic surveillance model is recommended.



Background Information

Cattle producers, industry analysts, policy makers, and others have voiced concerns about fed cattle price discovery for many years. As cattle markets have transitioned from predominantly cash-market sealed-bid or negotiated price discovery to more formula pricing, marketing agreements, contracts, and packer-owned cattle feeding, concerns about fed cattle price discovery have escalated. High levels of concentration in beef packing in Canada, exacerbated by cattle trade restrictions with the US that limited market access, have caused further unease with the Canadian fed cattle price discovery process. The magnitude of concern has prompted producers and policy makers in Canada and the US to propose legislation limiting who can own and feed cattle and regulating how fed cattle can be priced or marketed. Producers who – for a variety of reasons – have adopted pricing formulas, marketing agreements, contracts, and/or vertically integrated into owning packing plants (as well as many that have not) largely oppose restrictions on how fed cattle can be marketed and who can own and feed cattle. As such, the policy debate surrounding legislating the fed cattle price discovery process, pricing methods used, and cattle ownership restrictions is contentious. The primary purpose of this study is to provide the Alberta beef industry insight regarding potential fed cattle price discovery and related market impacts of evolving fed cattle marketing methods.

Efficient fed cattle price discovery is essential for sending appropriate and accurate price signals to market participants. Price discovery is the process by which buyers and sellers settle upon the sale price for a particular transaction. Price discovery is efficient when individual transaction prices accurately reflect expected market fundamental supply and demand conditions. In an efficient market, as new information arises that affects supply and/or demand, discovered prices quickly react to and reflect this news. Anything that inhibits market information flow reduces price discovery efficiency resulting in inappropriate market signals sent to market participants. Furthermore, as market conditions, structure, and scope change, the types of market information needed also

evolve. Enhancing attributes of market information and price discovery can be more costly than realized benefits; thus costs and benefits need to be considered as enhanced market information collection and dissemination are evaluated. Imbalances in market power between buyers and sellers (e.g., many small-volume sellers and few large-volume buyers of fed cattle) can further impact fed cattle prices. However, potential adverse impacts of market power imbalances are greatly reduced by complete market information flow.

In addition to information affecting price discovery efficiency, thinly traded markets, especially in the presence of market power imbalances between buyers and sellers, can adversely affect prices. Thinly traded markets refer to markets with low volume of transactions that are also often characterized by low levels of liquidity, large volatility in prices across transactions, and prices not adequately reflecting market fundamentals. Thin cash markets can be created by structural changes in the way cattle are marketed such as if contracts and marketing agreements that are not part of daily or weekly price discovery become dominant methods of trade. If formula pricing for example grows to represent the vast majority of a market, the remaining cash market trade can become thin.

Together, concerns about 1) market information, 2) imbalances in market power between producers and beef packers, and 3) thin markets have become significant sources of consternation for some beef industry participants. Determining how these factors affect fed cattle prices requires empirical analyses of data from the relevant market of interest. Impacts of these conditions on fed cattle markets (and elsewhere) have been thoroughly studied. Certainly the three concerns are related to each other and need to be considered jointly. We consider each of these issues as we focus on how the relatively recent growth in non-cash market, fed cattle trade in Canada (i.e., captive supplies) has likely affected fed cattle price discovery.

A wealth of research has been conducted on short-run market impacts, and longer term benefits and drawbacks, of the variety of non-cash marketing arrangements present in fed cattle markets. In particular, emphasis is placed on captive

supply impacts, which can be categorized or defined in a number of different ways. Here we will use a definition of captive supplies to refer to any fed cattle that are pre-committed to a particular beef packer beyond the typical two-week cash market window, regardless of when price is established. We include all grid cattle deliveries in this definition because they are known to a large extent by the packer well in advance of announced delivery by the cattle feeder.

A review and synthesis of this literature is provided to help understand potential industry impacts. Most research on this issue has been conducted in the US where market structure, mixture of marketing arrangements, and fed cattle marketing methods and dynamics differ from that in Canada. We try to bridge this gap by bringing aspects of the Canadian fed cattle market to the discussion surrounding empirical results. We also offer suggestions for specific research and management and reporting of market information the Canadian beef industry may want to consider.

Objectives

The overall objective of this project is to assess the potential impacts of captive supply arrangements on the Alberta beef industry. Specific objectives include the following.

1. Based on past research conducted in North America, summarize the relationship between captive supplies and short run fed cattle cash market prices.
2. Based on past research conducted in North America, summarize motivations for and assess benefits and drawbacks of captive supply arrangements.
3. Determine similarities and differences in beef packing industry structure and fed cattle marketing and ownership methods between Alberta and the US that might impact how captive supply arrangements affect cattle markets.
4. Identify market information needs relevant to the Canadian cattle industry that might reduce information asymmetry regarding marketing arrangements and prices for cattle producers and enhance industry competitiveness.
5. Identify research needs to better understand impacts of various cattle ownership, marketing methods and arrangements, and beef packer structure on fed cattle markets.

Procedures

To accomplish our objective, we conducted an extensive literature review of studies relating to captive supply in fed cattle markets. Because the majority of this work has been

completed relative to the US industry, we extract the likely relevance to Alberta where packer concentration is greater and a different mix of captive supply arrangements is present.

An integral component of the “relevancy” issue to Canada is comparing the US and Canadian (Alberta) packing industry structures and marketing/pricing practices of packers and feeders. A recent survey of all Canadian feedlots in 2005 sought information which paralleled information obtained in two US cattle feeding surveys conducted in 2002 and 2004. Comparable information exists on size and location of feedlots, extent of custom feeding, how feedlots price cattle, extent of purchases to the largest buyer, and related information. Also sought in the surveys were cattle feeder perceptions of marketing issues and potential policy solutions. Public information is available to compare the packing industry structure in Alberta with that in the US. We rely heavily on this survey information in our assessment.

Another integral component of assessing impacts of captive supply arrangements on fed cattle markets required us gaining a better understanding of details of various captive supply arrangements which exist in Canada. This is important to understand the flow of cattle to each of the major plants and any timing impacts associated with deliveries of marketing agreement or packer-owned cattle. Therefore, in-person interviews with numerous industry participants in beef packing and cattle feeding in Alberta were conducted to gain increased understanding of details of marketing arrangements present as well as to better understand concerns and strategies currently underway for managing these concerns.

The type and quality of information available to market participants is critical to market efficiency, and information asymmetry between buyers and sellers can be detrimental to the information-deficit side of the market. Therefore, market information available to fed cattle buyers and sellers in Alberta was carefully reviewed and compared with information available to US buyers and sellers.

Lastly, this project distills the above information from the literature review, packing industry structure, marketing and pricing practices of packers and feeders, and available information to provide insight into potential impacts of captive supplies on the Canadian beef industry. Based upon our review and assessments, we also provide future research needs.

US and Canadian Captive Supplies, Packer Concentration, and Pricing Methods

Estimating captive supply impacts in Canada requires understanding the market environment in which studies were conducted in the US. Likewise, it requires understanding both similarities and differences between market structure in the US and Canada.

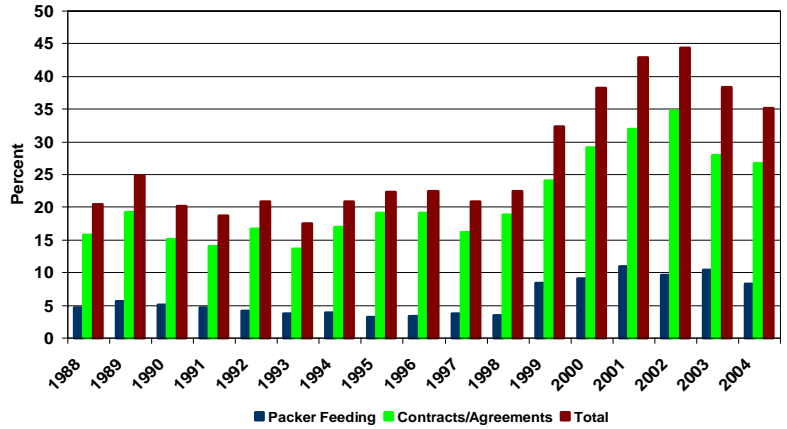
Captive Supply Comparison and Concerns – US and Canada

Grain Inspection, Packers and Stockyards Administration (GIPSA), US Department of Agriculture (USDA) has collected data from packers since 1988 on methods packers use to purchase fed cattle. Reported summary data are considered official captive supply figures in the US. Figure 1 shows the four largest beef packers' combined annual percentage of fed steer and heifer purchases procured by contracts/agreements, packer-owned feeding, and the total since the special survey began. Note that GIPSA began reporting audited packer data in 1999, which accounts in part for what appears to be a significant increase in captive supplies for 1999 and following years. Some of the increase resulted from clarification of GIPSA definitions in reporting procurement information from packers. Total captive supplies in the US peaked in 2002 at 45% of total steer and heifer slaughter and have declined somewhat the past two years.

Annual averages fail to account for the dynamics of packer purchases. Data available since mandatory price reporting enables tracking how the percent of total fed cattle slaughter varies by procurement method. Figure 2 shows weekly percent of purchases for US packers by negotiated (cash) trades, forward contracts, formula-based grid trades, negotiated-based grid trades, and packer-owned transfers. Note that negotiated-based grid trades only began being reported in April 2004.

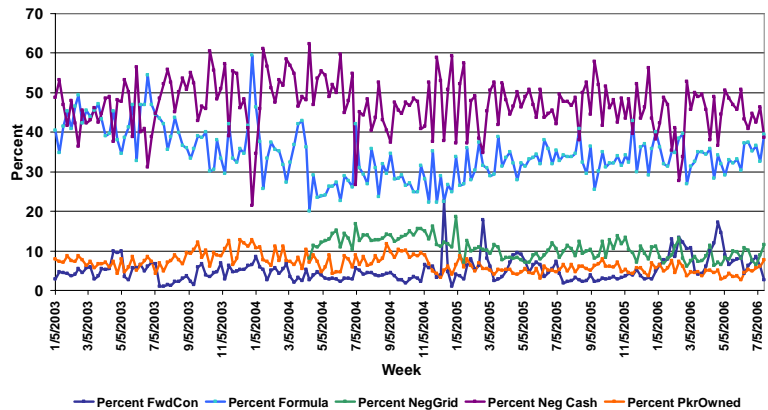
From data reported in Figure 2, we can estimate captive supplies. However, exactly what type of procurement methods to include in captive supplies is a question. Figure 3 shows captive supplies estimated in two ways. The single captive supply line prior to April 2004 splits into two lines after that date. The first method of estimating captive supplies consists of formula-based grid trades, forward contracts, and packer-owned transfers. After April 2004, the lower line is the continuation of captive supplies defined in this manner. The second method adds negotiated-based grid trades to the first estimate, some of which may be trades committed at least 14 days in advance of delivery, the time typically used in defining captive supplies, but some may not be committed that far in advance. The line lying above the other after the two lines split is the estimate of captive supplies after April 2004 with the inclusion of negotiated-based grid trades. Using the latter definition, the highest

Figure 1. Annual average captive supplies as a percent of steer and heifer slaughter by the four largest US beef packers, 1988-2004



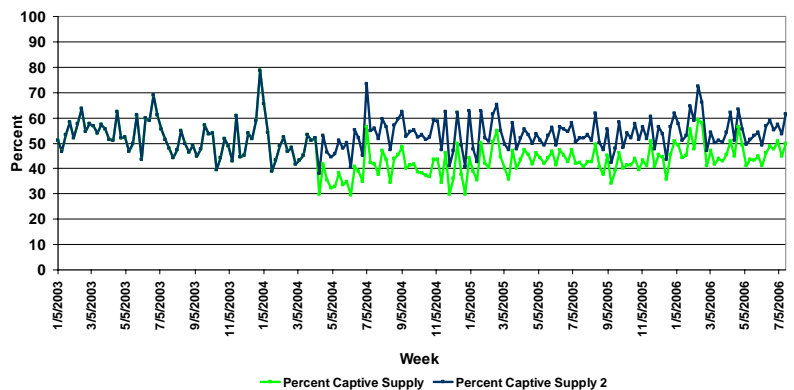
Source: Grain Inspection, Packers and Stockyards Administration

Figure 2. Weekly US fed cattle trades by procurement method as a percent of total fed cattle purchases, January 2003 to June 2006



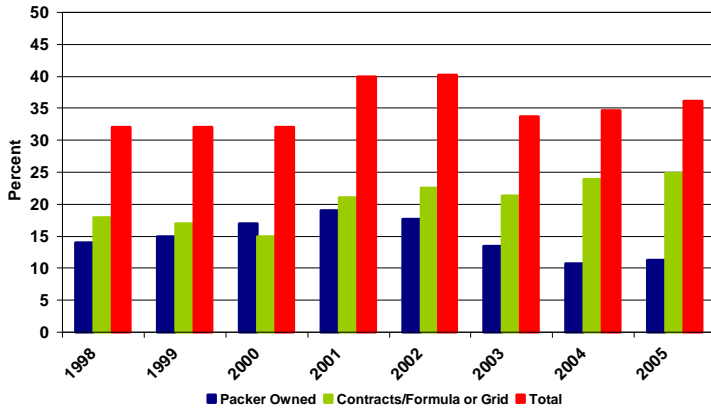
Source: Agricultural Marketing Service

Figure 3. Estimated weekly US fed cattle captive supplies, under alternative assumptions, January 2003 to June 2006



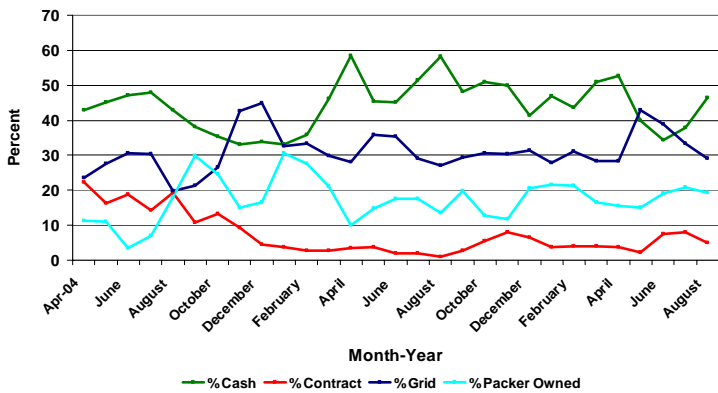
Source: Agricultural Marketing Service

Figure 4. Annual average captive supplies as a percent of steer and heifer slaughter by the three largest Alberta beef packers, 1998-2005



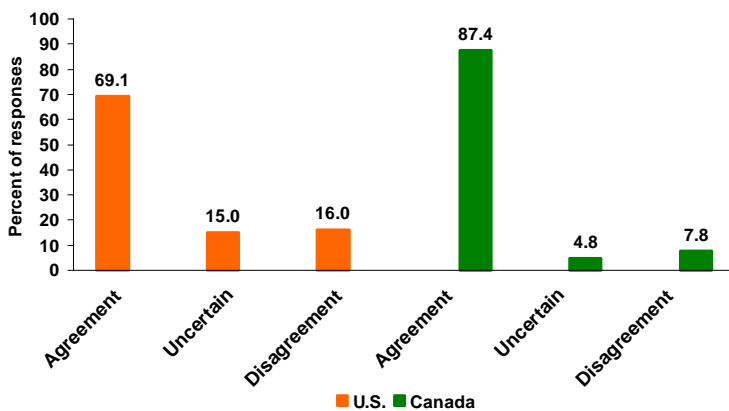
Source: CanFax

Figure 5. Weekly Alberta fed cattle trades by procurement method as a percent of total voluntarily reported trades, January 2004 to September 2006



Source: CanFax

Figure 6. Percentage response, US (2002) and Canada (2005), to: Reduced trading in the cash market would be harmful to the beef industry



weekly percentage of captive supplies occurred in December 2003 and reached a peak of 78.6%. On two other occasions, the weekly percent of captive supplies exceeded 70%. Typically the weekly percentage ranged from 50-60%. Excluding negotiated-based grid trades, the weekly percentage typically ranged from 40-50%.

There is no “official” estimate of captive supplies in Canada or Alberta. CanFax reports an annual percentage of packer purchases of fed cattle by Alberta packers. Packers voluntarily report purchases by procurement methods. Figure 4 shows the captive supply estimates since 1998. Estimates are divided into contracts, formula trades, or grid sales, and packer-owned transfers. The annual percentage of captive supplies peaked in 2001 and 2002 at 40%, similar to the US both in the time period of the peak and close to the highest percentage. Since then, captive supplies have declined somewhat.

The annual average figures for Alberta also fail to account for the dynamics of packer purchases. CanFax began reporting in April 2004 voluntarily reported sales of fed cattle from CanFax members by marketing method. Figure 5, just as Figure 3 for the US, shows that procurement methods vary from month to month. The highest percentage of captive supplies, based on the summation of forward contracts, grid trades, and packer-owned transfers, was 67% in November 2004 and January 2005. For 2006, captive supplies have comprised 51-63% of the total reported sales. Contract trades peaked at 22% in April 2004 but through all of 2006 have been below 10%. Grid transactions reached their peak in December 2004 at 45% of reported trades. Grid pricing in 2006 has ranged from 28-44%. Packer-owned transfers peaked at 31% in January 2005 and have ranged from 15-23% in 2006.

In a mail survey in 2005, Canadian feedlot managers expressed concern about the potential decline in cash market trading since the cash market serves as the reference market for grid pricing (Ward, Brocklebank, and Carlberg 2006). Their concerns were stronger than those expressed by US cattle feeders (Schroeder et al. 2002) (Figure 6).

Some feedlot managers track the base price in grids relative to cash market prices reported by CanFax members. A relatively high percentage of Canadian feeders also believe cash market fed cattle prices are lower when packers have cattle contracted for future delivery. Again, the concern expressed by Canadian feeders paralleled but exceeded that expressed by US feedlot managers (Figure 7).

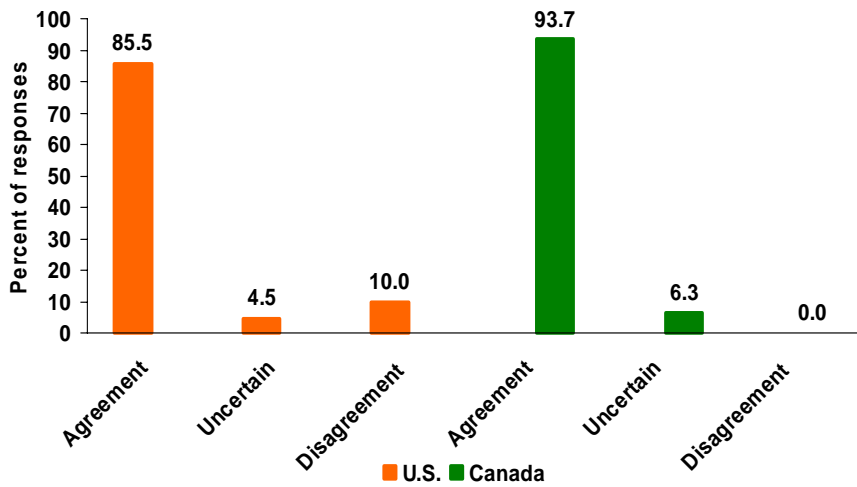
**Packer Concentration Comparison
– US and Canada**

GIPSA also reports the official concentration statistics for meatpackers in the US. Figure 8 shows the combined market share of the four largest beef packers since 1972 for steer and heifer slaughter and for boxed beef production. This statistic is often called the four-firm concentration ratio and is believed by some economists to be an indicator of market power by the largest firms. The four largest beef packers in the US have accounted for about 80% of fed cattle slaughter since the early 1990s. The same four firms have accounted for a slightly higher percentage of boxed beef production (80% or higher) since 1987.

No comparable packer concentration figures are available for Canada. In Alberta, the four-firm concentration figure would approach 100%, since nearly all fed cattle slaughter occurs in plants owned by four packers. While seemingly higher than the US, it should be noted that the Alberta figure is being compared with a concentration measure for all of the US. Figure 9 shows the location of the major fed cattle slaughtering plants in the US. In many states, there are only one or two large plants, not unlike Alberta, which has two large plants and two smaller ones. However, a state-level or province-level concentration measure may be too narrow to be an accurate indicator of buyer competition. Alberta feedlot managers responding to a 2005 survey reported 76.8% of their fed cattle were marketed to the largest buyer in 2004. This figure compared with 69.0% among US feedlot respondents for 2001. Thus, concentration in Alberta might be judged slightly higher than in the US. That may be especially true when considering one major difference between the US and Canada. The US has several adjacent states with large fed cattle slaughter, thus leading to substantial interstate movement between some states as well as interstate competition among plants. In Canada, however, relatively little interprovincial movement of fed cattle occurs.

Important to measuring buyer competition in Alberta is not interprovincial movement but international movement. As long as the US-Canadian border is open, US packers can and do compete for fed cattle from Alberta feedlots along with Canadian packers. Canadian feedlots reported that in 1999, 67.9% of fed cattle were sold to packing plants located in Alberta (Ward, Brocklebank, and Carlberg 2006). The second largest percentage (20.9%) was exported to US packing plants (note some of the plants that Alberta fed cattle are sold to in the US are also owned by the same parent company as the two largest Alberta packers). As expected, the border closing in 2003 greatly changed marketing patterns for many Canadian

Figure 7. Percentage response, US (2002) and Canada (2005), to: Cash market bids by packers are lower when packers have cattle contracted with feeders



feeders. In 2004, 89.4% of fed cattle were sold to plants in Alberta. The percentages sold to plants in Saskatchewan between 1999 and 2004 changed relatively little (4.2 and 4.9%, respectively) and similarly for Ontario (5.6 and 4.8%, respectively). Therefore, most of the change resulted from fewer fed cattle being exported to the US. This illustrates the importance of an open border to buyer competition for fed cattle in Alberta, and likely all of Canada.

Price Discovery under Alternative Packer Procurement Methods

Feedlot managers in Alberta, as in the US, price fed cattle by several methods. Canadian feedlot managers in a 2005 survey were asked to identify how cattle marketed from their feedlot were priced (Ward, Brocklebank, and Carlberg 2006). Sealed-bid pricing (either live- or dressed-weight) was the predominant pricing method in Alberta, accounting for 50.5% of fed cattle marketings in 2004 by respondent feedlots, with rail pricing second at 28.0%. Grid pricing in Alberta accounted for 5.7% in 2004 while contracting accounted for 6.4%. The remaining 9.6% was priced by some other method.

Among all Canadian respondents, the mixture of pricing methods anticipated to be used in 2009 equalized somewhat. Use of sealed bids as a percentage of fed cattle marketed was anticipated to decline to 32.6%; rail pricing, to decline to 26.0%; grid pricing, to increase to 19.4%; and contracting, to increase to 13.2%. Smaller feedlots tended to use sealed-bid pricing in 2004 somewhat more than larger feedlots, while larger feedlots relied more on rail pricing. Grid pricing was slightly higher among larger feedlots while contracting was slightly higher for smaller feedlots.

Feedlot managers indicated having 2-5 buyers bid on fed cattle as long as the US-Canadian border remains open. The number of bidders implicitly assumes the historical percentage of

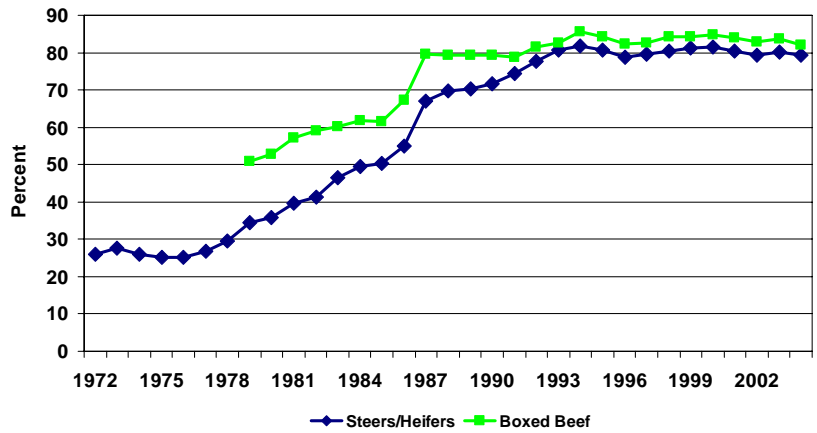
trades by procurement method. Should the percentage of captive supplies increase, the likely number of potential bidders would decline, even with an open border. Negotiated and sealed-bid trades are on either a live-weight or dressed-weight basis. Some feedlot managers identify a day and time deadline for receiving bids from packers, i.e., the sealed bid procedure for marketing fed cattle. After all bids are received, the feedlot manager determines the successful bidder. One notable feature of sealed bid pricing, is that several feedlots phone each bidder after the sealed bid deadline and tell each bidder what the winning bid was as well as the competing packers' bids. We discuss more about this later.

Grid pricing consists of a base carcass-weight price in conjunction with a price grid or matrix of carcass premiums and discounts for carcass attributes. Thus, each animal receives a unique price reflecting its actual wholesale value. Unlike sealed-bid or rail pricing, each animal in the sale lot receives the same price. An issue in the US, and equally relevant in Canada, has been how the base price in grids is discovered (Schroeder et al. 1998).

The most common method of determining the base price among feedlot respondents in Alberta was a formula tied to the plant average cost of cattle (43.5% of total grid priced marketings). For all Canadian respondents, smaller feedlots tended to use a formula tied to a cash market price quote (40.6% of total grid priced marketings), whereas larger feedlots used a formula tied to the plant average cost of cattle (52.2%). In both cases, the cash market is the reference market for the formula base price in the grid priced transaction.

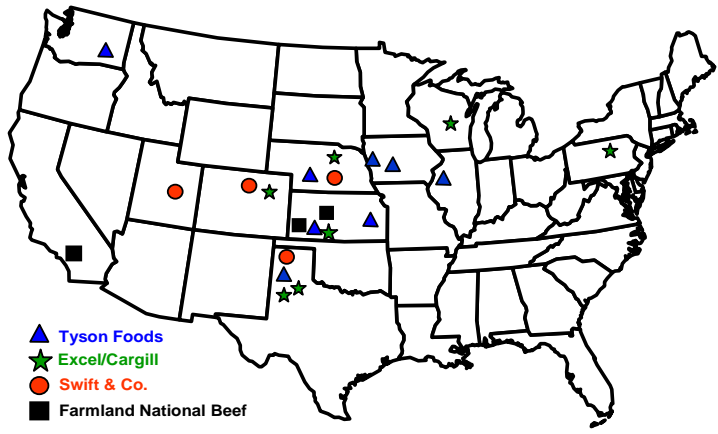
In the US, feedlots responding to a 2004 survey were divided into those using grid pricing for 50% or less of their fed cattle marketings in 2003 and those using grid pricing for more than half their marketings (Ward 2005). For the heaviest users of grid pricing, the base price was determined most frequently by a formula tied to a quoted price (39.1% of total marketings), followed by using a formula tied to the plant-average cost of cattle (29.6%) and a negotiated base price (23.5%). Therefore, for both US and Canadian cattle feeders, formula pricing with the cash market as the reference market was the most common method of determining base prices in grids.

Figure 8. The combined market share of the four largest US beef packing firms, 1972-2004



Source: Grain Inspection, Packers and Stockyards Administration

Figure 9. Major US fed cattle slaughtering plants for the four largest beef packers



Formula pricing grid sales to the cash market presents a potential “lemons market” phenomenon (Akerlof 1970). As noted, the majority of base price arrangements are formula prices tied to a reported cash market price or a plant-average price where the cattle are expected to be slaughtered. The key issue is whether fewer, lower quality cattle marketed in the cash market comprise the base price for higher quality cattle marketed on a grid. As fewer total cattle are priced on a sealed-bid or rail basis, the reference market for the formula base price may erode to the point of not reflecting true supply-demand conditions. The concern expressed by Canadian cattle feeders regarding this “thin market” issue was discussed above and shown in Figure 6. In order to formula price to a

cash market and be assured the base price reflects actual supply-demand conditions for the quality cattle marketed, there needs to be a viable cash market with a substantial volume of trades. Base prices can be discovered in a number of ways as we've seen. Two other alternatives are to formula price to an alternative reference market, such as the wholesale market (boxed beef cutout value) or futures market.

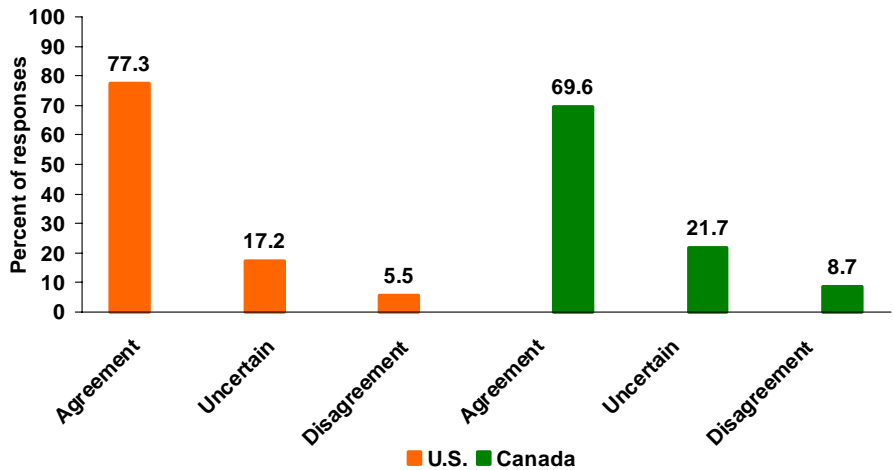
A disadvantage with formula pricing tied to a cash market is that packers have a natural, normal incentive to bid as low as possible for fed cattle. Fed cattle are a major input and the single largest expense, thus packers work to keep their input costs as low as possible. In doing so, feeders formula pricing to the cash market are tying their fed cattle prices to a market in which packers work to keep as low as possible. An alternative is to tie formula prices to another market, such as the boxed beef (wholesale beef) market. In this case, boxed beef represents the largest revenue item for packers and a market in which they have a natural, normal incentive to push as high as possible. Therefore, formula pricing fed cattle tied to the boxed beef market ties fed cattle to a market packers try to push higher. Over two-thirds of Canadian feeders and over three-fourths of US feeders recognize the advantage associated with tying formula prices to the boxed beef or retail market (Figure 10).

Feedlot managers indicated they determine the week fed cattle will be shipped and packers determine the day of the week. This seems to be the norm whether for live weight or rail priced cattle or grid priced cattle. With cash market trades (both live weight and rail trades), the feedlot determines the shipment week by what is put on the show list and the conventional one week pickup after purchasing the cattle. With grid pricing, packers may know the delivery week one-to-three weeks prior to harvest.

Rail prices are discovered the same week as the week fed cattle are harvested. However, with grid prices, the formula price may be tied to this week's cash market price (either a quoted price or packer cost of cattle) or the preceding week's cash market price.

There exists some negotiated grid pricing. This may be referred to as "bid the grid" pricing. A feedlot may solicit base price bids for a specific grid, either one the feedlot gives to the packer or one the packer is using. This combines grid pricing with negotiated or sealed bids from buyers. It encourages competitive bidding among packers purchasing

Figure 10. Percentage response, US (2002) and Canada (2005), to: Formula base prices in grids should be tied to boxed beef or retail markets



fed cattle with a grid, while seeking premiums associated with desirable carcass characteristics. However, given that most packer grids differ on quality and yield premiums and discounts, bidding on the base price is only part of the value-determination process.

Captive Supply Impacts in the US and Conjecture for Canada

Recap of Previous Captive Supply Research

Considerable research related to captive supplies has been conducted in the US (Table 1). A cursory summarization of the empirical research suggests there is typically an inverse relationship between captive supplies and cash market fed cattle prices. The estimated price impact has typically been relatively small, often less than \$0.05/cwt to as much as \$0.40/cwt. This negative relationship was found in studies that used monthly average prices in selected states as well as transaction prices from an area as large as the entire US.

There is no clear empirical evidence that the negative effect on prices is driven by beef packer oligopsony power motivations; i.e., to leverage pre-committed supplies against purchases in the cash market. However, theoretical research tends more often to point toward an anticompetitive motivation. This might suggest a negative effect at some unknown level of captive supplies. Expressed motivations by packers for captive supplies tend to be related to securing a supply of consistent, high quality cattle. Other research suggests both feedlots and packers use pre-committed supplies to reduce transaction costs in the procurement/marketing process. There

Table 1. Summary of Relevant US Research Related to Pre-Committed (Captive) Supplies and Their Impacts				
Research Study	Data Unit	Data Area	Data Period	Major Relevant Findings or Conclusions
Elam 1992	Months	State	1988-91	Lower fed cattle prices associated with higher deliveries of pre-committed supplies
Hayenga and O'Brien 1992	Weeks	State	1988-89	No consistent effects from captive supplies
Schroeder et al. 1993	Transactions	Local market	1990	Lower fed cattle prices were associated with higher levels of forward contracting.
Azzam 1996	Quarters	U.S.	1978-93	Evidence was found of a monopsony-inefficiency motive for vertical integration of fed cattle procurement by packers.
Azzam 1998	NA	NA	NA	A conceptual model of packer use of pre-committed supplies suggests an inverse relationship between price and pre-committed supplies is not due to non-competitive behavior, and the price effect from captive supplies is ambiguous.
Ward, Koontz, and Koontz 1998	Transactions	U.S.	1992-93	Lower fed cattle prices were associated with increased deliveries of two types of pre-committed supplies.
Love and Burton 1999	NA	NA	NA	A conceptual model of packer use of pre-committed supplies suggests packers pay a lower price for pre-committed supplies and increase plant efficiency.
Zhang and Sexton 2000	NA	NA	NA	A conceptual model of packer use of pre-committed supplies suggests packers may create a geographic buffer between rival firms, thus reducing competition and resulting in lower prices paid for livestock.
Lawrence, Schroeder, and Hayenga 2001	Packer surveys	U.S.	2000	Packers' indicated their primary reasons for contracting with feeders was to secure higher quality and more consistent quality cattle.
Schroeter and Azzam 2003	Transactions	Region	1995-96	Lower fed cattle prices were associated with increased deliveries of pre-committed supplies. Higher fed cattle prices were associated with one type of pre-committed supplies.
Schroeter and Azzam 2004	Transactions	Region	1995-96	Lower fed cattle prices were associated with high relative levels of pre-committed supplies. Packers with higher levels of pre-committed supplies paid lower prices than packers with lower levels of pre-committed supplies.
Xia and Sexton 2004	NA	NA	NA	A theoretical model of top-of-the-market contracting was found to have anticompetitive implications in concentrated markets when contracts are exclusive and buyers purchase cattle both in the cash and contract market.
Crespi and Sexton 2004	Transactions	Region	1995-96	A study simulating bids on fed cattle in a concentrated market compared with actual bidding found actual sale prices were lower than simulated bids.
Hunnicut, Bailey, and Crook 2004	Transactions	Region	1995-96	Packer-feedlot relationships were found to be quite stable over time and resulted from an attempt by both parties to reduce transaction costs.

is anecdotal evidence at least that feedlots have often taken the initiative to form long-term marketing contracts or agreements with packers. The 2002 survey in the US found virtually no evidence packers coerced feeders into using contracts or agreements (Schroeder et al. 2002).

Studies conducted on captive supply impacts in the US have been varied. Note from Table 1 that the data unit, data area, and data period have varied. Not shown in the table is the difference in the empirical or theoretical modeling across these studies. All these factors make an apples and apples comparison difficult across the research conducted and complicate any conjectures about past research for current and future impacts.

Another observation about the US research should be made as we attempt to relate the relevance of these studies to Alberta. We could and should ask how relevant these previous studies are in the US today. Note that for the data periods identified, the level of captive supplies is quite a bit lower than what we know exists today. The ending data period for all empirical studies is 1996. According to Figure 1, the total level of captive supplies for the four largest packers that year was 22%. Note also from Figure 1 the peak to date was twice that level, in 2002. Data shown in Figure 3 suggest even higher levels of captive supplies since 2004. Therefore, whether or not and how much the empirical results might differ for 2002 or today, relative to the periods in which prior research was conducted, is unknown. Economists generally would likely agree the extent of any negative effects from captive supplies would probably increase as the proportion of captive supplies increase. However, they also agree that if captive supply by packers lowers costs of operation in the long run (because of more efficient plant utilization, better planning, etc.), these lower costs could be in part passed on to cattle feeders in the form of higher prices. To date, no study has been able to measure these potential cost savings.

How relevant are the US studies to Alberta? Assume for the moment comparability in market structures between the US and Alberta. Captive supply data shown in Figure 4 do not extend back to 1996, the last data year for studies in the US. But captive supplies in Alberta for the earliest year reported (1998), exceed the GIPSA-reported level for the US in 1996 and have increased since that time, as they have in the US.

Market structures between the two countries appear similar, as noted above when comparing number of packers, concentration of buyers, and marketing to the largest buyer. This comparability is contingent on the US-Canadian border remaining open and fed cattle moving relatively freely from Alberta to US packing plants. The border closure changes the market structure dramatically. In that case, a smaller number of potential bidders are available to purchase fed cattle in Alberta, given a small volume and percentage of interprovincial fed cattle movement either eastward or westward from Alberta. With the border open, the Alberta market structure parallels that of many US states in which

there is high intrastate concentration which is mitigated considerably by competition from buyers located in adjacent states.

Market structure also affects the potential impacts from captive supplies. As the level of captive supplies increase and the degree of buyer concentration also increase, the more likely any negative effects from captive supplies will increase. Therefore, conjecturing on the potential effects from captive supplies in Alberta depends on whether or not the US-Canadian border remains open.

Another issue relates in part to the motivation for having pre-committed supplies and its likely effects. If a packer has pre-committed supplies but those supplies do not change much in volume or percentage of total needs from week-to-week, the impact on cash market prices is likely different than if captive supplies vary widely. Thus, assume a packer uses packer-owned feeding or contracts to secure a near-constant percentage of its weekly slaughter needs. The likely price effect is equivalent to simply having a smaller size packer purchasing cattle in the cash market. The smaller size would be the current size less the near-constant percentage of pre-committed supplies. There would be relatively little opportunity to leverage pre-committed supplies against cash market prices. If a packer's pre-committed supplies vary greatly from week to week, and the packer is involved both in packer ownership and contracting, the possibility of leveraging captive supplies to gain an advantage in the cash market is, or appears to be, more likely. Most empirical research in the US was conducted with data on pre-committed cattle purchases which varied considerably from week to week. However, pre-committed cattle delivery timing in the US, much like in Canada, is determined by cattle feeders generally selecting the week of cattle delivery for formula trade cattle and packers identifying the day to take delivery during the week. This suggests that aside from packer-fed cattle, delivery timing of most pre-committed cattle on a weekly basis is a result of cattle feeder decisions not packers using captive supply to leverage the cash market.

As noted above (Figure 7), cattle feeders in Canada have a stronger view of the negative impacts from captive supplies than do feeders in the US. Part of this difference may be related to packer profitability during the border closing (House of Commons 2005).

There appears to be at least three key factors affecting the likely effects from use of pre-committed supplies by packers in Alberta. First is the absolute level of captive supplies, which, as discussed, is slightly less than in the US. Second is the variability of pre-committed supplies in Alberta, which it would seem, is somewhat comparable in Canada (as seen from monthly data in Figure 5) to the US (as seen from weekly data in Figures 2 and 3). Third is market structure, which as discussed, is similar to individual feeding states in the US when the US-Canadian border is open.

A fourth factor of potential importance in Alberta combines motivation for using pre-committed supplies with market structure. The Tyson plant at Brooks, one of the two largest packers in the province, owns a large feedlot (Lakeside Feeders) which is adjacent to the plant. Two historical items should be noted. First, the feedlot existed prior to the packing plant being built. And second, ownership of the plant and feedlot have changed over time and ownership changes may have altered the relationship of cattle fed in the feedlot as a procurement source for the plant. Currently, it appears the feedlot provides a relatively stable flow of fed cattle for the plant.

Cargill, the other large packer in the province, has owned cattle in the past but tends to use contracts more commonly for pre-committed supplies. As noted earlier, most contracted cattle are marketed on a grid basis, thus enabling the packer to target specific cattle qualities for its branded beef programs. While some feedlots market a reasonably predictable flow of cattle to the Cargill plant each week, others do not; leading to some degree of week-to-week variability of pre-committed supplies into the plant.

A Conjecture on Captive Supply Impacts in Alberta

The level, variability, and distribution of captive supplies among buyers all within the existing market structure of buyers and sellers may affect the impacts captive supplies have on cash market fed cattle prices. Determining the trigger level or conditions under which captive supply effects are significantly negative is difficult. A few general expectations or conditions seem plausible.

- Negative cash market effects are likely to increase with an increase in proportion of captive supplies to total harvested fed cattle, giving buyers increased opportunities to use captive supplies as a leveraging tool.
- Negative cash market effects from captive supplies are likely to increase with an increase in the week-to-week variability of captive supplies, giving buyers increased opportunities, or the appearance, of using captive supplies as a leveraging tool.
- Negative cash market effects from captive supplies are likely to be related to or associated with a specific type of pre-committed supply and specific firm if key buyers tend to rely on a single, respective type of captive supply method consistently; e.g. one buyer exclusively or primarily using packer ownership of cattle and one exclusively or primarily using contracts.
- Negative cash market effects from captive supplies are likely to increase as the buyer market structure becomes increasingly concentrated, as when a major market intervention occurs such as the border closing. However, benefits to feeders having marketing agreements with packers may also be greatest under such abnormal conditions.

Quantifying an estimate of the net potential gains or losses associated with captive supplies was neither an objective nor feasible component of this study. This project was not intended to be an empirical analysis, and without which, no empirical estimate is possible. However, given above comparisons between Alberta and the US, based on available data, surveys, and interviews, a discussion of the potential net effect is presented here.

Given the motives for entering into captive supply arrangements, there are potential advantages to the parties involved. Under contracts or agreements, both feeders and packers may be reducing transaction costs and better targeting a specific quality and consistent quality of cattle marketed under those arrangements. Feeders marketing fed cattle by grid pricing obtain carcass data which should enable them in purchasing feeder cattle and feeding those cattle in a manner which potentially results in greater premiums and minimal discounts when fed cattle are marketed.

Packer feeding may enable packers to control better the quality and consistency of fed cattle harvested. In addition, packer ownership of fed cattle enables the packer to secure some percentage of its weekly volume well in advance of harvest.

Procuring fed cattle via captive supply methods also lends itself to potential adverse consequences. As previous research shows quite consistently, modest levels of captive supplies result in small negative effects on cash market prices. These small negative effects may well increase as the extent of procurement via captive supply methods increase. One might argue that doubling the extent of captive supplies would potentially double the adverse effect on cash market prices; though no empirical or theoretical study indicates whether the relationship between captive supplies and adverse cash market prices is linearly related.

In the US studies with the most detailed data and covering the largest geographic area, the negative effect on fed cattle prices given the modest levels of captive supplies which existed in the 1992-96 period was less than \$0.05/cwt (in \$US). Thus, even doubling the adverse effect with a doubling of captive supply procurement, similar to the levels in 2004-06, the potential dollar impact remains small though larger, at \$0.10/cwt.

Previous estimates of captive supply impacts are essentially average price effects over time and space, depending on the data collection period and locations. Potentially larger effects may occur in specific geographic areas, but these must be offset by smaller effects elsewhere for the average price effects to remain as they are estimated.

Data available since the US began mandatory price reporting enables us to compare prices for fed cattle by alternative procurement methods. These comparisons are useful as a means of comparing captive supply type purchase prices with

negotiated, cash market prices. However, they do not account for any overall negative or positive price effect – if either exists – from increasing captive supplies.

Figure 11 compares negotiated cash market prices on a live-weight basis with forward contract prices. Note some weeks, there is a significant discrepancy between the two lines, though both track major changes reasonably well. The price difference results in part to the nature of forward contract pricing. However, cash market prices tend to lead forward contract prices during periods of increasing prices; and trail forward contract prices during periods of declining prices.

Figure 12 shows a similar comparison between negotiated cash market prices on a live-weight basis with negotiated grid prices, which began to be reported in April 2004. The difference between these two lines is barely noticeable for most weeks. But there is also evidence that cash market prices tend to lead negotiated grid prices during periods of increasing prices; and trail negotiated grid prices during periods of declining prices.

Lastly, the same cash market prices are compared with formula prices in Figure 13. The week-to-week price difference is quite constant and can be explained in part by the one-week lag often found between formula prices this week tied to cash market prices last week.

Given the price comparisons with mandatory price reporting data for the US, there does not appear to be a significant, consistent advantage to one pricing method over another. However, these comparisons fail to account for any potential relationship between volume of captive supplies and price level.

The Canadian beef industry has alternatives which can be taken to alter packers' use of captive supplies. One avenue is legislative or administrative reforms. Canadian feeders were asked about outlawing contracts and marketing agreements in the 2005 survey, similar to the 2002 US survey. Only a third of Canadian respondents favored a ban on packers contracting with feeders (Figure 14). More than half of Canadian respondents disagreed with this alternative.

Figure 11. Comparison of negotiated, live weight cash market and forward contract prices in the US, 2004-2006

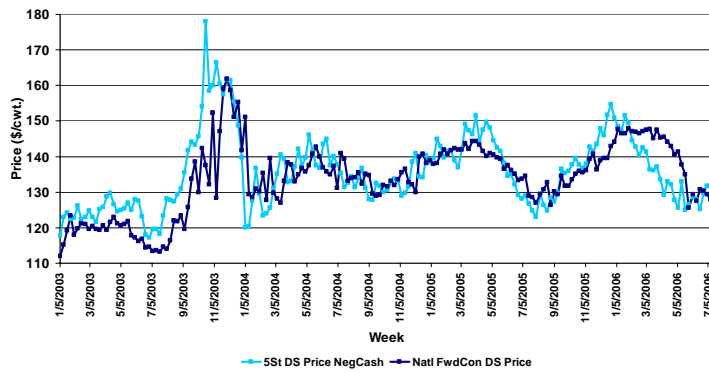


Figure 12. Comparison of negotiated, live weight cash market and negotiated grid prices in the US, 2004-2006

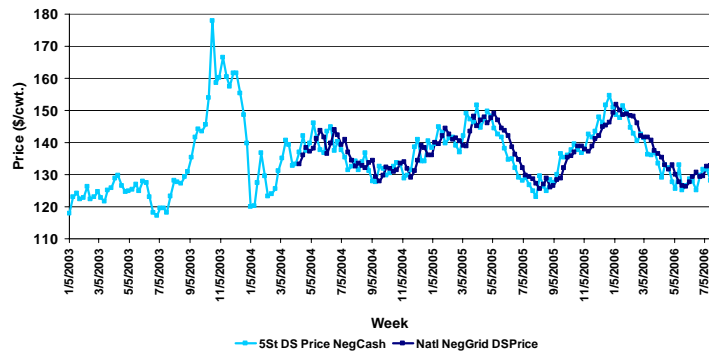
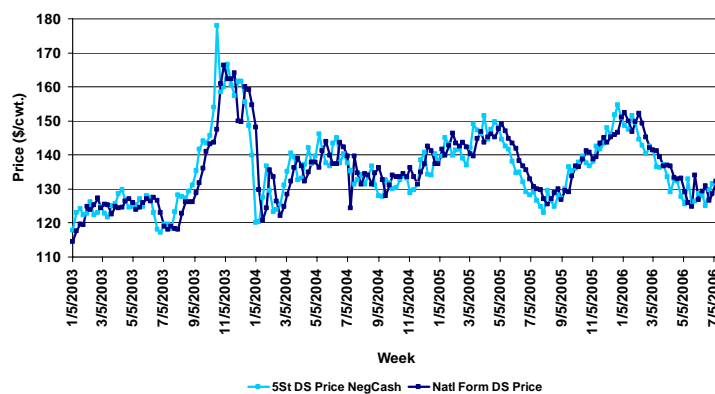


Figure 13. Comparison of negotiated, live weight cash market and formula prices in the US, 2004-2006



A significantly higher percentage of Canadian and US respondents favored a ban on packers owning and feeding cattle (Figure 15). One-half of Canadian respondents and two-thirds of US respondents agreed with this proposed ban. Interestingly, in both countries, the percentage of packer ownership is significantly lower than use of contracts and agreements but feeders are more opposed to packer ownership than their use of contracts and agreements. One possible explanation is that packers who own and feed cattle also become competitors for purchasing feeder cattle. Cattle feeders then experience packers both as competitors for buying feeder cattle and selling fed cattle.

Another avenue to help cattle producers market cattle more effectively is to increase market information available to them. Arguments have been made by some industry participants that presence of captive supply increases market leverage by beef packers relative to cattle feeders in part because producers do not have adequate supply and demand information about captive supplies relative to cash market cattle inventories to make informed marketing decisions. Because of the importance and changing role of market information in price discovery, we delve more into detail about information needs.

Market Information Needs in Canada and Possibility of Mandatory Price Reporting

Price discovery relies critically upon market information. Market transparency is a foundation of efficient markets. Buyers and sellers discover transaction prices for individual lots of cattle using available information to discern expectations regarding demand and supply conditions. At any point in time, cattle and beef supply and demand are unobservable and unknown. Therefore, market participants must have access to market information to arrive at a price at which they are willing to complete a transaction. Uninformed parties in a transaction face a significant probability of

Figure 14. Percentage response, US (2002) and Canada (2005), to: Packers should not be permitted to contract or form marketing agreements with feeders and cattle owners

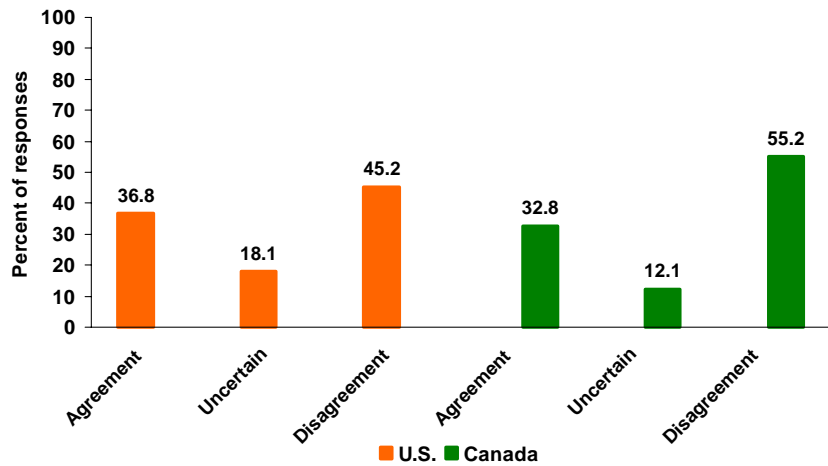
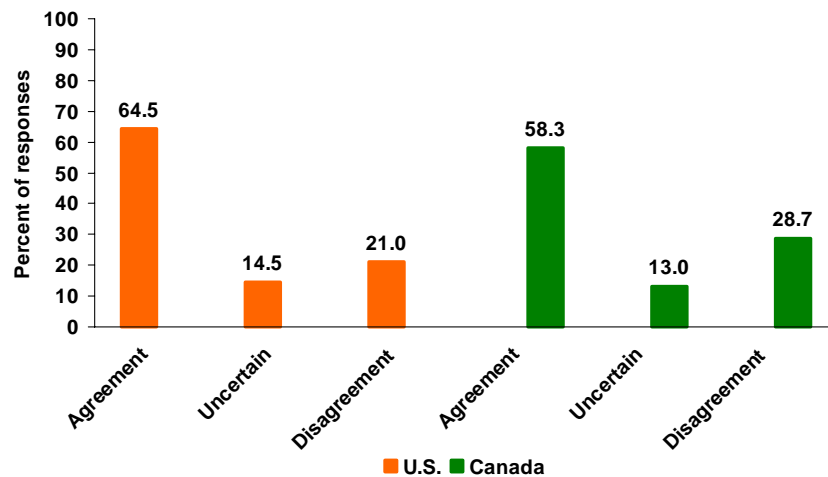


Figure 15. Percentage response, U. (2002) and Canada (2005), to: Packers should not be permitted to own and feed cattle



receiving or paying a price that is not representative of market conditions. Because of the imbalance in market concentration between many small decentralized cattle feeders and few large beef packers, beef packers naturally possess much more market information than do individual cattle feeders. Therefore, market transparency has the potential added benefit of partially counter-balancing market power.

Individual buyers and sellers have search costs in the price discovery process that include collecting and analyzing market fundamentals and finding a party to trade with in order to arrive at a price reflecting uncertain market conditions. Publicly available price quotes and developing market fundamentals significantly reduce search costs because they

reflect a wealth of information regarding supply and demand and they serve to communicate information to otherwise uninformed market participants. However, the informational value of prices and other pertinent market information depends upon how information is collected and transmitted. To be effective, market information must be:

- 1) timely,
- 2) relevant,
- 3) accurate,
- 4) reliable,
- 5) representative,
- 6) complete and comprehensive,
- 7) accessible and widely disseminated,
- 8) easy to interpret, and
- 9) utilized by market participants.

Does market information currently available to the Canadian cattle industry possess these characteristics? A comprehensive assessment of this question is beyond the scope of this project. However, fed cattle price discovery issues that surfaced during this study made it apparent that market information is a very important dimension of concerns surrounding captive supply.

One aspect of our research about customary industry practices used when selling fed cattle on sealed bid in Canada was reporting of all bids to all packers at the end of the bidding process. As we understand this practice, cattle feeders often reveal all bids to each packer at the close of a transaction in the sealed bid process (with variations on this practice). Further, individual packer bids have routinely been revealed to packers but not to other cattle sellers. We suspect this practice evolved out of the idea that this might help packers that are not winning bids to better understand why and to raise their bids accordingly. However, from an economic perspective, this is not the only probable outcome of this practice. Though this is a testable hypothesis, our experience indicates that such a practice will tend to make all packer prices merge toward the center of the price bids (i.e., so bids will all be nearly the same). That is, revealing all bids increases the low bid and at the same time reduces the high bid (not necessarily by the same amount). Whether this would happen and by how much is an empirical question, but we expect it would result in a lower fed cattle transaction price because the top price is likely to decline as such information is revealed.

For several reasons market information relevant to fed cattle price discovery has changed in recent years causing an evolution in information needs. When the US border closed to cattle export in May 2003 following the BSE discovery in Alberta until the border finally re-opened to cattle trade in July 2005, the cattle market in Canada was somewhat in disarray. The BSE discovery, and subsequent events, permanently changed the Canadian cattle market environment. Unrest escalated because of how much money cattle producers lost and the amount of money beef packers made (House of Commons 2005). Furthermore, rumors surrounding the

evolving border situation made fed cattle markets particularly volatile.

Methods of selling fed cattle have also changed making some market information more important and rendering some less important. For example, the predominant way to sell fed cattle on a sealed-bid live basis, which is the focus of most price reporting efforts, is declining in importance. Many feedlots have shifted to selling cattle on a formula-price basis removing these cattle from the weekly cash market price discovery arena. As the 2005 survey of cattle feeders indicated, cattle sold by sealed-bid in Alberta declined from 61.0% in 1999 to 50.5% in 2004. In addition, packer feeding of cattle in Alberta has reached as high as 24% on an annual basis (Figure 4). These issues create several potential concerns.

First, removing a lot of fed cattle from the sealed-bid trade can make this become a thin market with few transactions during any given day or week. This can make prices across individual transactions more volatile and potentially less representative of overall market conditions. Further, the cattle that are left in the cash sealed-bid market tend to be those from smaller cattle operations or are cattle that for whatever reason do not perform well on a value grid. Most cattle sold on grid to packers located in Alberta are sold with the base price calculated using the plant-average price paid for cash market cattle or a quoted cash market price. If cattle purchased in the cash market represent a smaller number of transactions from a variety of decentralized smaller cattle operations, either of these prices can be more easily influenced by a few transactions. In such a situation packers increase their ability to reduce fed cattle purchase prices.

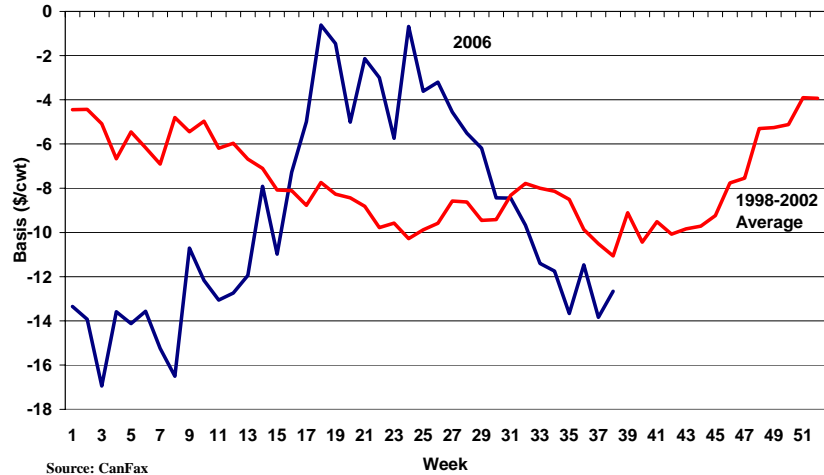
One method to monitor whether this is occurring is to continuously compare base prices and sealed-bid cattle prices being offered by a packer with those of other packers in the market region (e.g., comparing base prices with the CanFax price quote). Of course, comparing the CanFax fed cattle price to a particular packer's transaction price may not be all that meaningful because that packer's price might represent a substantial portion of the CanFax price quote on any given week. That is, one is comparing the base or transaction price to a price quote that is made up potentially in large part by that packer's prices (similar to comparing the price to itself). Canada fed cattle basis relative to US fed cattle prices is used as another fed cattle price benchmark. However, Canada fed cattle basis has become more volatile recently suggesting it is not as useful as it may have once been for monitoring fed cattle prices in Canada. Figure 16 illustrates weekly Alberta cash to Nebraska cash fed steer basis. Canada fed steer price went from nearly \$17/cwt under Nebraska early in 2006 to just about even in June to back to more than \$12/cwt below by September. Clearly, US fed cattle price is not a reliable benchmark for Canadian fed cattle prices given the volatility in the price relationships.

Our visits with industry participants in Canada revealed a wide range in perceptions about how many cattle are represented in cash market transactions relative to other methods. For example, some felt packers were feeding a sizeable number of their own cattle and that this activity adversely affects fed cattle prices. Some perceived packers to be feeding very few cattle. Others indicated packer cattle feeding does more to increase feeder cattle prices than to reduce fed cattle prices. Some felt packer feeding of cattle was either miniscule and/or of little concern. Generally, based on our discussions, the feedlot owned by Tyson appears to be used to source cattle at a steady flow into the Tyson plant and thus is probably not a strategic reserve or cattle timing mechanism to influence fed cattle prices.

However, the magnitude of uncertainty and angst surrounding packer cattle feeding suggests that providing more frequent, routinely reported, and reliable information about packer cattle feeding could help reduce producer unrest. This is a case where increased transparency could reduce anxiety as well as help producers in pricing and price discovery decisions.

Based on our interviews of industry participants in Alberta, cattle market information provided by CanFax is widely recognized and heavily used by producers. Cattle feeders especially use information on fed cattle markets for price discovery, negotiating terms of trade, negotiating contract specifications, and using CanFax data as a benchmark to determine how prices they receive compare to market-reported prices. Of the small sample of industry participants we visited, most seemed pretty comfortable that the price data provided by CanFax are reliable and represent a significant amount of trade. However, a couple of information gaps were noted by some cattle feeders: 1) information on forms of cattle procurement being used (including gaining a better idea of how thin the cash trade is) at least on a weekly basis and, 2) understanding packer and further downstream industry margins over time. In addition to these concerns, CanFax price data are obtained from a sample of voluntary reports and thus one cannot say for sure whether they reflect the entire market without a more formal analysis. CanFax data indicate the percentage of cattle represented in voluntary reported fed cattle trade by pricing method varies widely from month to month, ranging from 38% to 75% since the report began in 2004. Generally industry sentiments suggested CanFax reported price quotes were considered reliable and representative. Having such a representative and reliable price series is critical for the industry especially when other benchmark prices such as the US are not closely integrated with Alberta fed cattle prices. Some have suggested that mandatory price reporting might help increase transparency and thus fed cattle price discovery in Canada.

Figure 16. Alberta to Nebraska Weekly Fed Steer Basis (Cash to Cash)



Mandatory Price Reporting

Structural changes in Canadian fed cattle markets and fed cattle marketing methods tend to parallel what has happened in the US, with noted differences discussed earlier. Therefore, a brief background on the US mandatory price reporting system is useful. In April 2001, mandatory price reporting went into effect in the US requiring slaughter plants (which slaughter 125,000 head of cattle or more, 100,000 head of swine or more, or slaughter/process 75,000 head of lambs or more annually) to report information on pricing, contracting for purchase, formulated sales, and supply and demand conditions twice daily to the US Department of Agriculture, Agricultural Marketing Service (Pendell and Schroeder 2006). In December 2004, when the Act was due to terminate, the Livestock Mandatory Reporting Act was extended until September 30, 2005. Because Congress could not agree on the length of an extension of MPR, the Act expired in the fall of 2005. However, USDA continued the livestock reporting program on a voluntary reporting basis. In December 2005, results from review of MPR by the US Government Accountability Office (GAO 2005) were released. GAO made several recommendations including increasing transparency of market reports by improving market reporters' instructions regarding excluded transactions and reporting those effects of the excluded transactions, and auditing transactions from packers because of errors discovered by GAO in price reporting by packers. In September 2006, the US Senate passed a bill to reauthorize the Livestock Mandatory Reporting Act of 1999 for another five years which from there went to the President. With the US Farm Bill reauthorization in process, details of this Act could be embedded in some of that debate.

Prior to livestock mandatory price reporting (MPR), producers relied on the US Department of Agriculture Agricultural Marketing Service (AMS) livestock market news reports for fed cattle price information. These reports were generated

from voluntarily reported prices by producers, packers, feedlot operators, and other participants in the cattle industry to AMS market reporters. However, over the past two decades cattle feeding consolidated and shifted from smaller feedlots to larger commercial feedlots. In addition, cattle feeders began to adopt alternative methods to sell cattle, including contracts and marketing agreements, that were not part of the AMS voluntary fed cattle price reports (Perry et al. 2005). By 2002, 44% of fed cattle marketed were sold through these alternative methods (GIPSA 2002). Increased contracting and formula pricing agreements resulted in there being frequently insufficient daily prices collected from regional fed cattle markets for AMS reporters to report a market price quote (US Department of Agriculture 2001). As a result, the voluntary reporting system was criticized by some industry participants for not being representative of all cattle trade and not having a consistently reliable price publicly quoted (Grunewald, Schroeder, and Ward 2004). To address these issues, while attempting to help facilitate price discovery, encourage competition, and provide all market participants with timely price and transaction information, Congress passed the Livestock Market Reporting Act of 1999.

So what did MPR do for the US cattle industry? The bottom line is it provided some new useful information and resulted in loss of other important market information. What MPR revealed is essentially more details about numbers and general terms of trade for cattle procured under ways other than cash markets (i.e., contracts, marketing agreements, grids, etc.). In addition, more price information about boxed beef sales became available (or at least more transactions represented in the reported prices). What was lost with advent of MPR were price quotes for certain market regions for which the USDA no longer summarized prices that they did before advent of MPR. Further timeliness of market information available was also adversely affected by MPR. Under voluntary price reporting, AMS market reporters released information about prices during the day as they received the information. Under MPR, price summaries are only made available at specified report release times that summarize trade that occurred the previous day or earlier in the current day. No “real-time” market information is provided during the day.

Would the Canadian cattle industry benefit from mandatory price reporting? A recent study conducted by the George Morris Center reviewed MPR in the US (Grier 2004). Grier concluded that MPR had increased the amount, accuracy, and transparency of prices to producers. He found MPR to be less timely than some voluntary price reports which it replaced. Whether or not MPR assisted producers make better marketing decisions was not clear. Lastly, he concluded that MPR probably had not helped producers get better prices for their cattle.

The Grier report estimated additional costs for implementing a MPR system in Alberta at \$750,000/year, split between packers and an agent contracted to implement the mandatory

system. He assumed such an agent would be or could be CanFax.

Grier’s assessment of MPR in Alberta relative to the US failed implicitly to recognize one key attribute of US price reporting, whether voluntary or mandatory. Information is a public good meaning that everyone individually uses it freely and regardless of how many people access market information, the amount available remains the same. Because of this character of market information its value is difficult to measure for each user. Each user, in turn, has difficulty placing a value on ensuring its timeliness, accuracy, etc. This suggests that from a public perspective, individual producers would under-invest in information collection relative to the public value of such efforts. Therefore, in the US, the cost of market information has been borne in large part by taxpayers rather than relying on the private sector. That is not to overlook the voluntary price reporting efforts through such organizations as Cattle-Fax, Texas Cattle Feeders Association, and others, which Grier appropriately discusses.

An impediment to implementing MPR in Alberta as envisioned by Grier is the added cost to CanFax members and packers. However, no consideration was given to an alternative means of implementing MPR, such as by Alberta Agriculture, Canada Agriculture, or some other public entity.

Grier makes a critically important point that relates to the perception of MPR in the US. Expectations for MPR must be realistic and obtainable. As he correctly notes, MPR likely did not increase producer prices in the US. While many producers expected higher prices to result from MPR, most economists expected MPR would have a neutral to no significant effect on price level. MPR was expected by some economists to increase price variance, which it did (Perry et al. 2005). MPR was expected to increase transparency and provide additional information regarding captive supplies, both of which have occurred (Ward 2006).

The primary things that might be gleaned from MPR in Canada would be more information that would have more wide-spread industry representation every day on prices and methods of cattle trade. That is, transparency of trade would increase because of wider coverage of a larger and more consistent sample of price and volume data being summarized each day. However, as has been experienced in the US, MPR did not displace private industry price reporting services such as Cattle-Fax. In fact, because of the timeliness of real-time data needs, it probably increased their importance in the US. Therefore, MPR in Canada would provide more confidence and verification of prices and increased information on terms of trade, popularity of various types of marketing methods, and prices for different forms of cattle trade, but it would likely not fully displace timely price data being collected and reported by CanFax. If mandatory price reporting is pursued in Canada, we recommend a careful and comprehensive review of alternative funding methods as well as what data to collect, and also how best to synthesize, summarize, and

report the data. A key question which must be answered is how trades would be collected for fed cattle exported to the US. Without information on these trades, considerable potential value of a MPR system in Canada would be lost.

Developing Responses to Price Discovery and Competition Issues: NW Consolidated Beef Producers and Producer-Owned Packers

Canadian beef industry participants we interviewed for this report identified two developments initiated by producers to address or mitigate price discovery and competition concerns in Alberta. Both parallel producer efforts in the US and each is discussed here.

Northwest Consolidated Beef Producers

Texas cattle feeders spearheaded development and implementation of Consolidated Beef Producers (CBP) in April 2000. CBP was formed as a nonprofit corporation under the Texas Cooperative Marketing Act. Its purpose is to market fed cattle for member feedlots who commit their fed cattle to the marketing cooperative. CBP attempts to represent a sufficient volume of fed cattle each week to acquire countervailing leverage in the marketplace against larger packers. CBP reports marketing 1 million cattle annually (<http://www.consolidatedbeef.com/index.html>) for its 230 member feedlots in 15 states.

Full members pay \$3,000 plus a \$1/head marketing fee. The fee enables CBP to hire a manager and staff which in turn report to a 14-member board of directors. Cattle are marketed in the manner believed to be in the best interest of member feedlots, whether on a live- or dressed-weight basis or grid. If marketing on a grid, an attempt is made to match the cattle with the packer grid that will return the most possible money for the cattle owner.

CBP members notify CBP staff two weeks or more prior to when their cattle are estimated to be ready for harvest. At that point, cattle are deemed committed to CBP and CBP becomes the sole marketing agent for all marketing and sale decisions related to those cattle. For these services, CBP members pay a dollar per head marketing fee.

Feeders are asked three questions regarding their potential interest in joining CBP. Those are

1. Are you satisfied with how your cattle are being marketed?
2. Do you believe the way you are marketing cattle will change in the near future?
3. Do you want to participate in the change?

CBP expressly represents cattle feeders who wish to remain independent but involved with a consolidated, coordinated marketing program.

Several Alberta beef producers are similarly interested in forming an organization patterned after and perhaps tied to CBP and referred to as Northwest Consolidated Beef Producers or NW CBP. Plans were to launch NW CBP in fall 2006. We visited with some Alberta feeders who planned to join and have promoted NW CBP as well as some feeders who do not plan to become members of the marketing group.

Nearly everyone indicated the concept has merit and would be a positive in the marketplace for feeders and cattle producers. Comments varied. Generally, more marketing alternatives are better than fewer. NW CBP could reduce transaction costs for packers by potentially purchasing in larger volume from a single entity with which to negotiate prices and terms of trade rather than individually contacting several feedlots. Similarly, it was believed that transaction costs would be reduced for feeders also. Feedlot managers would spend less time and search costs becoming informed and contacting and negotiating with packers.

Expectations regarding price and competition impacts varied somewhat. There was a general view that smaller cattle feeding operations are less informed regarding the value of their cattle because of the infrequency in which they are involved in the market and that they generally have very little negotiating leverage with large packers. Further, beef packers, with asymmetric information relative to feeders, were perceived as being able to pay less for cattle purchased from smaller feedlots. If this is true, NW CBP could potentially improve prices received by smaller cattle feedlots. This stems from reduced transaction costs as noted above and from NW CBP gaining a degree of countervailing leverage as well as having more complete market information in negotiating with packers. That negotiating edge comes mostly from better coordinating the type of cattle to the packers most needing those cattle.

Whatever price advantage is gained for some individuals, the overall market impact was not expected by persons we visited to be large. However, it was thought any strengthening of market prices from enhanced competition and improved coordination would bolster the US-Canadian basis and support the base price in grids. Furthermore, some feeders using formula pricing arrangements where the base price is tied to prices paid for cash market cattle, felt NW CBP could help ensure that the base price would not be as easily influenced by smaller operations that might receive prices lower than they would if NW CBP represented their cattle.

Ranchers Beef

Another alternative strategy to deal with fed cattle price discovery concerns is to form producer-owned packing firms, sometimes organized as a cooperative or limited liability

corporation. If beef packers were enjoying substantial profit margins from beef processing, a producer-owned packing firm should be able to capture some of that margin directly for its producer-owners. Further, bringing another cattle buyer to the marketplace would increase demand and competition for fed cattle which would increase cattle prices. Canadian cattle feeders were asked in the 2005 survey whether additional producer-owned packing firms would benefit the industry. The degree of agreement was nearly identical to US cattle feeders who responded to the 2002 survey (Figure 17). Over half the respondents in each country agreed.

In the US, one such producer-owned packer has had considerable success. US Premium Beef (USPB) began operating in December 1997. USPB purchased a share of Farmland National Beef, which operated two plants in western Kansas. Since then, USPB has increased its ownership of Farmland National Beef and purchased another producer-owned packer, Brawley Beef, operating in California.

The management of USPB attributes part of the company’s success, as measured by premiums paid to cattle owners and appreciation of stock in the company, to being able to develop branded beef products. USPB was able to use the distribution channels and system that a sister organization, Farmland Foods, developed for its successful branded pork products.

Several producer-owned ventures are in varying stages of operating or being considered in Canada. Perhaps the early-adopter of these is Ranchers Beef in Alberta. Ranchers Beef is owned by a small group of cattlemen/investors. Ranchers Beef is building its business by paralleling success of another related pork operation. Ranchers Beef considers itself a niche or specialty player relative to the larger packers in the province. The company is targeting export markets in Asia and elsewhere. In our opinion, ventures like Ranchers Beef

have a higher likelihood of being successful if they find their appropriate niche and do not compete directly in every facet of their business with much larger, more efficient, conglomerate beef packers.

Reaction by feeders we visited was similar to the reaction they had regarding NW CBP. More marketing alternatives are better than fewer. One additional packer, even for a subset of the available cattle for market, creates added competition and can have a positive effect on prices for fed cattle. As with NW CBP, any positive effect on price may strengthen the US-Canadian basis and bolster support for the base price in grids. However, no one we visited expected the overall market price impact to be large.

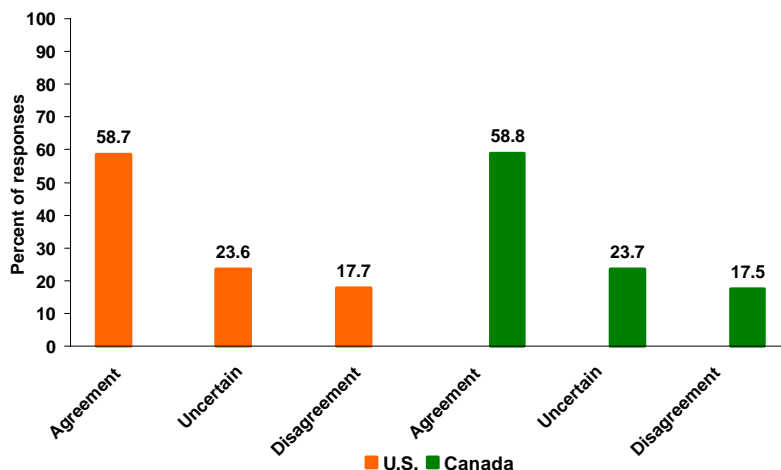
Several noted that while Ranchers Beef has a plan, the necessary commitment and financial backing, and market access, additional hurdles will be encountered. Time will tell whether this venture succeeds. Certainly success of Ranchers Beef or similar efforts depends in part on the expectation of resumption of normal beef trade with Asian countries and no further trade disruptions due to animal health, food safety, or political events.

Research Needs

Many of the fed cattle pricing questions being raised in Canada require empirical analysis. Theory provides a framework for developing economic analyses, but it does not provide sufficient conclusions about magnitude and often even direction of impact. Furthermore, although, as we have discussed, many aspects of the Alberta fed cattle and beef packing market structure and environment are similar to that of the US, enough differences are also present that simply extending US research findings to Alberta is tenuous.

From our review of research, our examination of selected market information in Canada, our interviews with Canadian beef industry players, and our experience in analyzing fed cattle markets and conducting economic research, we have identified a few specific research needs related to fed cattle markets in Canada. We have listed these research recommendations in an unranked and un-prioritized order. We leave prioritization to Alberta Beef Producers.

Figure 17. Percentage response, US (2002) and Canada (2005), to: More producer-owned packers would benefit the beef industry



1. *Short-run impact of captive supply in Canada on cash fed cattle prices*

We have discussed captive supply research in the US that has consistently found an inverse relationship between cash market fed cattle transaction prices and captive supply. Results indicate very small economic impact of captive supply on cash fed cattle transaction prices. However, these studies were conducted with captive supplies that were at much lower levels than currently present in Alberta. Both formula cattle trade and packer-owned cattle percentages are higher now in Alberta than they were in any empirical work completed to date. A study that calibrates how cash fed cattle market prices (both price level and price variability are important dimensions of such a study) might be affected by various levels of captive supply and by different types of captive supplies would be an important component of the proposed research. We simply do not know whether one can double or triple prior estimates and apply them to the current Canadian situation. Doing this would result in estimates that have unknown reliability. We recommend that before any policies designed to potentially limit or control how fed cattle are owned or sold, careful empirical analyses be conducted to determine these relationships.

2. *Net and differential impact of captive supply on Canadian cattle producers*

Despite a sizable body of literature presenting evidence and arguments that presence of captive supplies provide benefits to both cattle feeders and beef packers (through reduced costs and/or improved revenues), no study has quantified these benefits nor compared possible benefits to potential adverse impacts. As such, if short-run impacts of captive supplies on cash market fed cattle transaction prices are adverse, but there are important economic benefits to those who market cattle through captive supply arrangements and to beef packers who use captive supplies, then the **net** captive supply impacts on the industry and the **differential** impacts on different groups of participants (those involved in captive supply arrangements and those that are not) are critically important from a policy perspective. Both beef producers and beef packers might enjoy net economic benefits from captive supplies of fed cattle even if cash fed cattle market prices decline by some amount when captive supplies increase. This question has not been resolved because no one has measured the overall net impacts (positive or negative) of captive supplies or the differential impacts on different market players (i.e., those that do and those that do not use non-cash methods of fed cattle trade). We strongly recommend before policy prescriptions regarding captive supply in Canada be considered that such a study be completed.

3. *Determinants and Surveillance of Alberta to US cash fed cattle market basis*

Basis between US and Canadian cash fed cattle prices has been used as a barometer of fed cattle prices in Canada. This is a logical comparison because cattle feeders in Canada sell sizeable amounts of fed cattle to packing plants located in the US suggesting US and Canadian fed cattle markets share important overlap. However, cash fed cattle basis (difference between Canada and US cash fed cattle prices) has exhibited considerable and unprecedented variability, even with the border re-opened to fed cattle trade since 2005. Undoubtedly, there are both short- and long-run cash market basis determinants between Canada and the US. Understanding basis determinants will provide increased information Canadian cattle producers can use to assess packer bids, to make more informed cattle marketing decisions, manage risk, and to provide market surveillance and assessment of Canada fed cattle market conditions. With reduced cash market cattle trade occurring, increased market surveillance and an enhanced understanding of fed cattle price relationships across location are increasingly important in assessing market performance.

4. *Market or Industry Monitoring Model for the Canadian Beef Industry*

Markets are dynamic and change in response to many policy and market-related conditions, as anyone associated with the Canadian cattle industry can well attest. Canada does not have a regulatory body similar to the Grain Inspection, Packers and Stockyards Administration (GIPSA) in the US Department of Agriculture. As such, there is no body providing focused direct oversight of competitive issues and conditions in the Canadian beef industry. Development of a market or industry model of the entire Canadian beef industry which could be used on a continual basis to monitor market behavior and performance is recommended. Such a model would be available to address issues as they arise, such as a border closing, packer mergers, plant closings and openings (including Ranchers Beef), new marketing firms (like NW CBP), introduction of mandatory price reporting, and other related developments. Two key elements of such an effort would be input at the outset to ensure the model incorporates the degree of specificity required by the industry; and a commitment to update the model so that it not become simply a one-time effort and then forgotten. Therefore, this would be a longer-term research commitment, and probably one extending beyond Alberta Beef Producers alone, but one that may provide considerable usefulness to the beef industry in Canada.

References

- Akerlof, G.A. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism." *The Quarterly Journal of Economics* 84,3(1970):488-500.
- Azzam, A. "Testing the Monopsony-Inefficiency Incentive for Backward Integration." *American Journal of Agricultural Economics*. 78(1996):3 585-90.
- Azzam A. "Captive Supplies, Market Conduct, and the Open-Market Price." *American Journal of Agricultural Economics*. 80(1998):1 76-83.
- Crespi, J.M. and R.J. Sexton. "Bidding for Cattle in the Texas Panhandle." *American Journal of Agricultural Economics*. 86,3(2004):660-74.
- Elam, E. "Cash Forward Contracting vs. Hedging of Fed Cattle, and the Impact of Cash Contracting on Cash Prices." *Journal of Agricultural and Resource Economics* 17(1992): 205-17.
- Grier, K. "Final Draft Report: Mandatory Price Reporting of Beef Cattle in Alberta." George Morris Center, Prepared for Alberta Beef Producers. July 2004.
- Grunewald, S., T.C. Schroeder, and C.E. Ward. "Cattle Feeder Perceptions of Mandatory Price Reporting." *Review of Agricultural Economics* 26(2004):521-38.
- Hayenga, M.L. and D. O'Brien. "Packer Competition, Forward Contracting Price Impacts, and the Relevant Market for Fed Cattle." *Pricing and Coordination in Consolidated Livestock Markets: Captive Supplies, Market Power, and IRS Hedging Policy*. Wayne D. Purcell, ed. Blacksburg, VA: Virginia Tech University, Research Institute on Livestock Pricing. April 1992.
- House of Commons. "Final Report: Financial Analysis Relative to Meat Packing Companies in the Context of the BSE Crisis of 2003." 38th Parliament, 1st Session, Report of the Standing Committee on Agriculture and Agri-Food, Report 10, November 2005.
http://cmte.parl.gc.ca/cmte/CommitteeList.aspx?Lang=1&PARLSES=381&JNT=0&SELID=e24_&COM=8973
- Hunnicut, L., D.Bailey, and M. Crook. "Rigidity in Packer-Feeder Relationships." *Journal of Agricultural and Applied Economics*. 36,3(2004):627-38.
- Lawrence, J.D., T.C. Schroeder, and M.L. Hayenga. "Evolving Producer-Packer-Customer Linkages in the Beef and Pork Industries." *Review of Agricultural Economics* 23,2(2001):370-85.
- Love, H.A. and D.M. Burton. "A Strategic Rationale for Captive Supplies." *Journal of Agricultural and Resource Economics*. 24(1999):1 1-18.
- Pendell, D. and T.C. Schroeder. "Impact of Mandatory Price Reporting on Fed Cattle Market Integration." *Journal of Agricultural and Resource Economics* In press, 2006.
- Perry, J., J. McDonald, K. Nelson, W. Hahn, C. Arnade, and G. Plato. "Did the Mandatory Requirement Aid the Market? Impact of the Livestock Mandatory Reporting Act." US Department of Agriculture, Agricultural Marketing Service, Outlook Report (LDPM13501), September 2005.
<http://www.ers.usda.gov/Publications/LDP/Sep05/ldpm13501/>
- Schroeder, T.C., R. Jones, J. Mintert, and A.P. Barkley. "The Impact of Forward Contracting on Fed Cattle Prices." *Review of Agricultural Economics* 15(1993):25-37.
- Schroeder, T.C., C.E. Ward, John Lawrence, and Dillon M. Feuz. *Fed Cattle Marketing Trends and Concerns: Cattle Feeder Survey Results*. Kansas State University, Report MF-2561, June 2002.
- Schroeder, T.C., C.E. Ward, J.R. Mintert, and D.S. Peel. "Value-Based Pricing of Fed Cattle: Challenges and Research Agenda." *Review of Agricultural Economics* 20,1(1998):125-34.
- Schroeter, J.R. and A. Azzam. "Captive Supplies and the Spot Market Price of Fed Cattle: The Plant-Level Relationship." *Agribusiness* 19,4(2003):489-504.
- Schroeter, J.R. and A. Azzam. "Captive Supplies and Cash Market Prices for Fed Cattle: The Role of Delivery Timing Incentives." *Agribusiness* 20,3(2004):347-62.
- US Department of Agriculture. "Livestock Mandatory Price Reporting System Report to the Secretary of Agriculture." LMPR Review Team, Washington D.C., July 2, 2001.
- US Department of Agriculture, Grain Inspection, Packers and Stockyards Administration (GIPSA). *Packers and Stockyards Statistical Report, 2002 Reporting Year*. SR-03-01.
- US Government Accountability Office (GAO). "Livestock Market Reporting: USDA Has Taken Some Steps to Ensure Quality, but Additional Efforts Are Needed." Washington D.C., December 2005.
- Ward, C.E. "Factors Influencing the Extent of Grid Pricing of Fed Cattle." Selected Paper, NCR-134, Commodity Price Analysis and Forecasting Conference, St. Louis, Missouri, April 2005.
- Ward, C.E. *An Assessment of the Livestock Mandatory Reporting Act*. Oklahoma State University Extension Fact Sheet F-606, July 2006. <http://www.osuextra.com>

Ward, C.E., A. Brocklebank, and J.G. Carlberg. "Canadian vs. US Fed Cattle Pricing and Marketing Practices and Viewpoints." National Beef Industry Development Fund, Report x, 2006. In review.

Ward, C.E., S.R. Koontz, and T.C. Schroeder. "Impacts from Captive Supplies on Fed Cattle Transaction Prices." *Journal of Agricultural and Resource Economics* 23(1998):2 494-514.

Xia, T. and R.J. Sexton. "The Competitive Implications of Top-of-the-Market and Related Contract-Pricing Clauses." *American Journal of Agricultural Economics*. 86,1(2004):124-38.

Zhang, M. and R.J. Sexton. "Captive Supplies and the Cash Market Price: A Spatial Markets Approach." *Journal of Agricultural and Resources Economics*. 25(2000):1 88-108.

We acknowledge financial support for this project from Alberta Beef Producers. Furthermore, we especially appreciate the time and candid discussions numerous Canadian beef industry participants generously provided to us during the process of completing this study.

Copyright 2006 by Ted C. Schroeder and Clement E. Ward. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copy right notice appears on all such copies.