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Livestock Price Discovery in Canada

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Many of the economic research projects undertaken by the George Morris Centre involve an explanation of how prices are arrived at in Canada. Often, when addressing an income, pricing, or production challenge, it is necessary to break down the pricing structure in order to arrive at a solution. In other words, the root of a problem or opportunity is often found in the components of the Canadian price structure. For example, one of the signs that Country of Origin Labeling (COOL) was negatively impacting the Canadian livestock industry was that Canadian prices declined relative to the US. The question then became, what caused the decline and which element of the pricing process was affected? In addition, there are often very strong assertions in the livestock industry that Canadian pricing needs to be decoupled from US price. The desire for a “Made in Canada” price is often expressed, particularly in times of low prices. It is always assumed that a Canadian price would be higher than the current price.

This paper serves as a reference regarding the components of livestock pricing in Canada. The more we understand about the factors behind the components of livestock pricing, the better able we are to assess the challenges and opportunities in the market. That is, while industry participants have a strong knowledge of pricing components, it is useful to put together the entire process to provide perspective on the steps and functions. This paper also make clear why it is unlikely that Canada will ever be decoupled from US livestock prices.

Pricing Overview

Price Determination and Price Discovery

Two leading US livestock economists, Clem Ward of Oklahoma State and Ted Schroeder of Kansas State assert that there are two overall concepts that help frame the discussion surrounding how prices are arrived at in any given region or for any given transaction. One of the concepts is “price determination”, which refers to the big picture or overall price levels for a commodity. The other concept is “price discovery”, which pertains to how an individual farm or firm arrives at a transaction price.

For Canadian livestock producers, price determination is based on global, but mostly US, meat supply and demand forces. These forces, such as livestock inventories, production, competing meat prices, consumption and trade, all come into play to determine a base price level. That is, these global and US forces of supply and demand combine to determine an overall price level or

trading range for meat and livestock. Of course, Canadian livestock and meat supply and demand are important components of the overall global and North American market forces.

As long as trade in meat and livestock is relatively free and open, Canadian pricing is going to be determined at the macro level through global and US markets. If Canadian prices move either too high or too low relative to the US or other markets, supplies will either move into or out of Canada, rapidly. This rapid movement of livestock or meat supplies due to price differentials will effectively erase those differentials. This process is called arbitrage.

The overall price level is ultimately expressed as a representative, widely quoted US price for either cattle or hogs. This representative price might take the form of a futures contract or a regional price such as Nebraska steers or Iowa-Southern Minnesota hogs. In other words, Canadian producers can see the overall macro price level for hogs by accessing futures prices or USDA quotes for livestock in various regions.

Price discovery is more of a micro or transactional concept. In Canada, it typically takes the form of a basic formula for the buyer-seller transaction and interplay:

$$(US\ Price \div US\$/Canada\ Exchange\ Rate) - Spread\ or\ Basis = Canadian\ Price$$

Whether the price is a formula price for a contract, or a spot market negotiation, the fundamental final price is going to look very similar to this basic formula.

The US price for the discovery process in Canada can be any US regional price, national price or futures contract. The US price chosen is often referred to as a “reference price.” In Canada, the vast majority of market hogs sold to Canadian packers are contracted between producer and packer, and formula priced. The hog price formulas in Canada are increasingly based on the widely reported USDA “National Daily Direct Hog Prior Day Report – Slaughtered Swine,” LM_HG201. The HG201 provides a reference price, which also happens to be the reference price for settling US Chicago Mercantile Exchange (CME) futures contracts. Another common US hog reference price for formula pricing in Canada uses the Western Corn Belt, or Iowa-Southern Minnesota prices. Both of those are widely followed and reported by the USDA. Weaner prices in Canada are sometimes formula-priced based on the CME Lean Hog futures contract for finished hogs.

Contracting is far less prominent in the Canadian cattle industry, but when it occurs, US live cattle futures contracts are typically the reference point. A packer offering a contract will use the CME Live Cattle Futures as a starting point for the final price for future delivery. Spot market negotiation or bid and ask represents the bulk of the live cattle trade in Canada. In these cases, both Canadian packers and cattle producers are aware of the prevailing US price levels. A final price is discovered between the two Canadian parties, based on that starting point. In any event the US price is the starting point of the formula between buyer and seller in Canada.

The exchange rate is a crucial component of pricing and price risk. As the exchange rate appreciates, prices decrease and vice versa. Many formulas use the Bank of Canada noon quote for either a specific day or the weekly average.

Spread and Basis

The starting point in formula and negotiated pricing is the exchange rate-adjusted US price. The US price and the exchange rate are readily available and can be used to determine a Canadian equivalent price. Following this, local conditions play an important role. Local conditions are quantified in the price spread or basis. The spread and basis are the most interesting and contentious components of the price discovery process, because they constitute the local or regional component of the price.

The price spread is the difference in price between one geographic region and another. The basis is the difference in price between one geographic region and a CME futures contract. The two terms, basis and spread, are often used interchangeably by industry participants. Nevertheless for these purposes, the basis refers to the Canadian regional price difference with the CME, and the spread refers to the Canadian regional price difference with a particular US regional market.

Most regions of Canada have greater livestock supplies than capacity to slaughter the livestock. These regions are, therefore, referred to as being on an export basis for livestock, which means that the pricing in these regions is generally lower than in those regions on an import basis. Export basis pricing in a region in Canada is equal to the US price, adjusted for the exchange rate less the cost of moving the livestock to an alternative region in the United States. Canadian livestock buyers will logically only pay what the livestock seller's alternative market is offering, less the cost of moving the livestock to that alternative market. At its most basic level, the spread or basis is the cost of transport and logistics (customs and inspections) for moving livestock from a Canadian region to the US alternative market.

Once again, the concept of decoupling or having a "Made in Canada" price needs to be addressed. It simply does not make sense for a livestock buyer, whether a cattle feeder or a packer to pay more for livestock than the US price less the cost of shipping from Canada to the US. Conversely, if the buyer chose to pay less than the US price less transport, livestock would rapidly flow south and the buyer would have no supply. When borders are open, with no trade distorting policies, talk of an independent pricing system is simply uninformed. Canadian poultry producers enjoy a "Made in Canada" price, which can only be achieved by artificially restricting the supply (quota) and, at the same time, keeping the border closed through extremely high tariffs.

Returning to the discussion of transport, consider the case where it costs C\$2,000 to move a load of hogs from the Prairies to a plant in the mid-west US. This would amount to roughly C\$10/head or about \$10/ckg. As such, if the payment price at a US plant amounts to US\$55/cwt live and if the exchange rate is 0.95, the Canadian dollar equivalent is C\$58/cwt live. Converting to metric and adjusting for yields, the Canadian equivalent price is roughly \$160/ckg. The actual return to producers after transport, however, would be \$150/ckg. The effective prevailing price in Canada on the cash market becomes C\$150/ckg, as domestic packers would not be willing to pay more than the US price less the cost of transport. The same logic applies to cattle. The cattle price in southern Alberta is going to be roughly the US price converted by the exchange rate, less about \$8/cwt for cost of transport. The cost of transport from southern Alberta to a Northwest US packer is going to represent the major component of the spread.

In addition to the cost of transport and logistics, however, the spread can also convey important market information regarding conditions in both the US and Canadian regions. The spread and basis can and do often vary from the cost of transport. When the spread varies from the cost of transport and logistics, it means that there are supply and demand factors at work in either the export or importing regions.

The differences in local supply and demand are immediately reflected in cash market or spot market prices. If it is a longer term development related to changes in supply and demand, the changed conditions are eventually incorporated into a change in the formula price on contracts.

Supply Impacts on the Spread and Basis

If the supply of livestock is seasonally short, relative to packer demand, the spread can become less than the cost of transport. In other words, spot market bids become greater than the US price adjusted for transport. The opposite is true when supplies become seasonally long relative to packer demand. For example in Ontario, cattle feeders often market seasonally large volumes in the fall. At that time, the spread with the United States “widens” or becomes more than the cost of moving cattle to the US. With regard to longer term changes, as hog supplies grew during the early to mid-2000’s packers re-wrote contract pricing formulas lower to reflect that supplies were greater than their capacity-driven demand. Conversely, when Maple Leaf first began operations in Brandon, local prices were driven higher due to stronger local demand.

US supplies are also important considerations, as US activity in Canada is often a result of the state of US supplies. In periods when US supplies are ample, US bids on Canadian livestock will be less or non-existent than when supplies are short. As such, it is relatively simple to see how supplies will play a role in making the spread or basis diverge from the transportation cost. Canadian packers immediately react to the lower or no US bids by lowering spot or cash market bids in Canada. If it is clear that the US supply situation is changing over the longer term, this then will eventually be reflected in the formulas in renegotiated contracts in Canada. That is, longer term US changes in supply will result in changes to pricing formulas in Canada.

Demand Impacts on the Spread and Basis

Demand factors can alter the spread or basis and cause it to deviate from the transportation base. Conversely, the spread or basis can also provide important information with regard to the factors that influence demand in different regions. With regard to livestock, demand is generated by either packers or livestock finishers. Further, it is worth reviewing how cattle and hog packers decide on the target price they will bid or contract for livestock. The following is the basic pricing equation for a packer:

$$\textit{Target Bid Price} = \textit{Meat Revenue} + \textit{By-Product Revenue} - \textit{Operating Costs} - \textit{Target Margin}$$

Of course the final packer price bid will also be based on the price determination and discovery factors noted earlier. Nevertheless, this basic equation helps packers determine whether their bid price can be within the overall market range. That is, packers may have a bid price as a target, but the market realities may dictate more or less than this price. If prevailing regional livestock

market prices are higher than the packer's target bid price, then the packer's margin will be lower than targeted. If the prevailing market is lower than the target bid price, the packer margin will be higher than targeted.

This equation specifically relates to the Canadian packer demand side of the argument. It is meant to show how or why the spread is more meaningful than simple transport costs. The point is that, as the revenue items increase and/or the operating costs decrease, packer demand for livestock increases and the bid price can increase. If revenues decline and/or operating costs increase, packer demand decreases and the bid price will need to be adjusted lower.

The factors in this equation can result in local prices in a given region being above or below what would have been indicated by simply using the cost of transport in the discovery process. It is for this reason that the competitiveness of the Canadian packing industry is important to livestock producers. If packers are not operationally efficient relative to US packers, or when the Canadian regulatory system imposes higher costs or lower revenues compared to the US, they are going to bid lower for livestock to be competitive on the meat market. Again, a short-term challenge is reflected in cash market prices. A longer term challenge or issue will be reflected in formulas in hog contracts.

Livestock finishers face a similar margin-driven equation for the price they can pay for feeder livestock. Essentially, the higher grain prices are, the lower the bid price for feeder livestock and vice versa. Just as importantly, the higher the finished livestock price, the higher the price they can bid for feeder livestock, and vice versa.

The Canadian basis can also be impacted by US demand. Factors that either increase or decrease US demand for Canadian livestock will have a positive or negative impact on the Canadian livestock basis. Canadian packers are immediately aware of increases or decreases in US buyer demand for Canadian livestock. For cattle, this increase or decrease in US demand is immediately reflected in the spread or basis in Canada. Again, short term changes in US demand are reflected in the cash market, and long term changes are reflected in the formulas, the main pricing mechanism in the hog market.

As a final thought on the influence of the US price level, consider a situation in which Canada is on an import basis on livestock. If, for some reason, there is a surge in slaughter capacity beyond Canadian inventory levels, Canadian packers will import livestock. In order to pull livestock away from US packers, Canadian packers will need to pay the US price, plus transport. Otherwise, US finishers would have no reason to ship north. Being on a US price plus the spread or basis, would be a positive for Canadian finishers. Regardless of this, however, it is still tied to the US price.

The fact is that the Alberta cattle price is tied to the US Northwest price, as the US Northwest price is tied to Nebraska and Texas. The Ontario hog price is tied to the Indiana hog price just as the Indiana hog price is tied to Iowa. The only time Canada truly had a "Made in Canada" livestock price was when the borders were closed during the BSE crisis.

Summary of Price Discovery and Determination

Prices in Canada are derived by both micro and macro factors. Prices are influenced by overall supply and demand for meat in the world, as well as local conditions. These large and small picture factors are reflected in either spot market prices or formula prices. Local conditions are reflected in the basis or spread. Spot market prices immediately reflect any change in local conditions. Formula prices reflect changes that are likely to be longer term.

Again, the more we understand about the factors behind the components of price structure, the better able we are to assess the challenges and opportunities in the market.

Finally, it should be very clear that it is not possible to arrive at a “Made in Canada” price for livestock and meat that is freely traded. The process known as arbitrage will keep Canadian prices on a North American basis.

Livestock and meat prices are analyzed and forecasted regularly in George Morris Centre market reports. These reports can be accessed through free two-month trials. If interested in a free trial, contact Kevin Grier at kevin@georgemorris.org.