Economics and Marketing:
Understanding and Using Basis Levels in Cattle Markets

What is Basis?

Basis is the difference between a cash price and a futures price. Often a basis quote refers to the “spot” basis, which is the difference between the current cash price for slaughter or feeder cattle and the “nearby” futures price. For Canadian producers, the spot basis means the difference between the Canadian cash market and a US futures price, since the only futures market in North America that trades cattle futures contracts is the Chicago Mercantile Exchange (CME) located in Chicago, Illinois.

A futures contract price reflects what traders think today that cattle will be worth at a specific future time, and the cash market reflects the actual selling price of a physical commodity. As time passes, the cash price and futures price typically converge or come together. The difference between the two markets is the basis. The basis will usually change over time as the nearby futures month gets closer to the present time. The changing basis level can provide opportunities for pricing cattle.

How to Calculate Basis

Since futures contracts are traded in US dollars and based on US grades of cattle, futures prices must be converted to a Canadian dollar equivalent. Once this conversion is done, a simple subtraction from the local cash market price will give a basis for that class of animal. This basis will show the difference between today's cash price and what the futures market believes, today, that cattle will trade for at a point in the future.

Calculating today’s spot basis
Today is June 4th and a feedlot has a pen of finished steers. The packer buyer has bid C$ 148/cwt for the animals. The feedlot operator needs to know what basis the buyer is offering in his bid. The cattle owner calculates the basis this way:

First, the feedlot operator must figure out which is the nearby futures month for CME Live Cattle (slaughter cattle) futures. Since today is June 4th, the futures month that is closest to June 4th is August.

$$Basis = Cash\ cattle\ price - \left(\frac{August\ live\ cattle\ futures}{Exchange\ rate}\right)$$

$$Basis = C\$148 - \left(\frac{US\$140.70}{US\$\ 0.92/C\$}\right) = C\$\ 148 - C\$\ 152.9 = C\$ - 4.9$$

Or, *Basis* = C$ 4.9/cwt under futures

The basis being offered for this pen of cattle is -C$ 4.9Cdn or C$ 4.9 under the August Live Cattle futures price. It is expressed in Canadian dollars. The feedlot operator knows a more normal basis (average basis for last 5 years) for steers during June is about -C$ 5.8 or C$ 5.8 under August futures. A better or stronger basis is one that gives a higher cash price providing that futures don’t change in the meantime. Since the basis is stronger than the average basis, the cattle seller would accept the offer of packer buyer.

Calculating the Forward Basis

Today is June 4th. There is a pen of 950 lb. steers being fed for sale to slaughter weight. The feedlot buyer expects the animals to be finished in mid October. A packer buyer is offering a flat price or forward contact of C$140/cwt. for the steers delivered to the plant during the third week of October. The price applies providing the cattle meet the specifications stated in the contract when they are delivered. The feedlot buyer wants to know what basis is built into that flat-price or forward price contract.

Step 1: Choose the futures delivery month closest to, or just past, when the cattle will be sold.
If cattle are targeted to finish in January, use the February Live Cattle futures in the basis calculation. If cattle are targeted to finish in July, use August futures. Never choose a contract that will expire, or stop trading, before your cattle are ready to sell. Live Cattle futures contracts for slaughter-weight animals trade for the months of February, April, June, August, October, and December.

Remember, this pen of steers is expected to weigh 1,415 lb. in the mid of October. The closest Live Cattle futures contract after October would be the December futures contract. Suppose the December contract is trading today at US$149.83/cwt. Remember, this futures quote is today's estimate of what US fed steers will be selling for in December, four months and a week into the future. Of course, that doesn't mean that December futures will actually be trading for US$149.83/cwt. in December. It just means the market thinks that, today, December futures will be trading for US$149.83/cwt.

Step 2: Convert the futures price into Canadian dollars so it can be compared to an Alberta direct-to-packer A-grade fed steer price.
Exchange rate futures are the best tool to estimate the applicable US/Canadian dollar exchange rate expected in December. Quotations for Canadian dollar futures, available on Internet web sites or some daily newspapers, are suitable for this purpose. In this example, the closest Canadian dollar futures contract is December. It closed at US$ 0.9122. The December Live Cattle futures price of US$149.83/cwt converted to Canadian funds is:

$$\frac{US\$\ 149.83}{US\$\ 0.9122/C\$} = C\$\ 164.25/cwt$$

Remember, the packer buyer is offering a flat price contract, sometimes called forward price contract, for the pen of steers. He is offering C$ 140/cwt. for the steers delivered to the plant at the end of June.

Step 3: Calculate the basis.
$Basis = Contract\ price - Live\ cattle\ futures$
$Basis = C\$\ 140 - C\$\ 164.25 = -C\$\ 24.25\ \ or\ \ 24.25/cwt\ \ under\ October$

The forward basis that the buyer is offering in his flat price contract is $24.25 under the October futures. By comparing this basis "bid" to historical basis levels for mid of October, and by assessing market conditions for the cattle being fed, the seller will have more information to decide whether the flat price contract is a good deal. The 5-year average of feeder cattle basis in AB for October is -C$ 12.8 or 12.8 under. Comparing the average basis with basis from offered forward contract indicates that the seller may shop the market more widely to try to find a better or stronger basis level.

Calculating Feeder Cattle Basis

The process for calculating either the spot or forward feeder cattle basis is nearly the same as for finished cattle. The one difference is that there are two more feeder cattle futures months traded at the CME than there are live cattle.

CME Feeder Cattle futures contracts represent 50,000 pounds of 650 to 849 pound medium and large-frame feeder steers. They trade for the months of January, March, April, May, August, September, October and November.

Start figuring the basis by selecting the proper CME Feeder Cattle futures contract, described in **Step 1**, above. Remember that CME Feeder Cattle futures trade for different months that CME Live Cattle futures.

Then, convert the Feeder Cattle futures price into Canadian dollars per hundred-weight, as shown in **Step 2**, above.

Finally, subtract the futures price from the local cash market price, as shown in **Step 3,** above.

Things to remember about feeder cattle basis levels
Local feeder weight classes can be quite different from the weights used for the Feeder futures markets. Care must be taken to compare two similar classes of feeders. Again, CME Feeder Cattle futures contracts are for 650-849 lb. feeder steers.

Prairie feeder cattle markets are sensitive to both local supply and demand of feeders and the local supply and demand conditions of feed grains. (See the module: *Predicting Feeder Cattle Prices*). Those two things can and will have significant impacts on Alberta feeder cattle basis levels. Also, the US feeder cattle markets follow their local feeding practices and feed grain prices. There are a number of unique US feeding practices that can impact CME feeder cattle futures but which don't impact Canadian feeder cattle markets. For instance, the use of winter wheat pastures for over-wintering feeders. That practice makes the US market sensitive to pasture conditions all year long. Poor US winter wheat pasture conditions will cause feeders to move into feedlots early and impact both the feeder and live cattle markets.

Using basis as part of a feeder cattle marketing strategy is similar to that for fed cattle. However, when the Canadian feeder basis is considered to be overly weak, there is the choice to hold the animals longer than originally intended, and possibly finish them to slaughter weight. Holding slaughter-ready cattle from the market, waiting for a stronger basis, is only a short-term choice. The risk of overweight discounting increases the longer slaughter cattle are held.

How to use a basis in cattle marketing decisions
Basis levels should be used as part of a total marketing strategy but not used in isolation. Producers should follow cash markets, futures markets as well as basis levels to take advantage of pricing opportunities. Basis levels do fluctuate over time as conditions change and the market reacts to these changes.

Begin by examining historical basis levels in terms of their fluctuations, seasonality patterns and size of the basis relative to the price of the cattle. This will give a good indication of whether the spot or forward basis levels are **strong** (narrow) or **weak** (wide), and thus signal pricing opportunities

Historic slaughter and feeder basis charts show the average basis for all cattle at various times of the year. These charts don't show the basis level differences, which can be significant, between different herds. Some cattle will consistently be sold at a basis that is stronger than the average. Other cattle will consistently be sold at a basis that is weaker than the average.

This basis difference between herds or breeds or types of cattle is why it is very important that producers calculate their own basis every time they sell some cattle. This basis information will indicate to the producer the value differences in their cattle from industry averages. The value differences will reflect grade and type discounts or premiums. A producer's own basis information, gathered over time, will provide a more effective basis history than the industry averages alone.

How to use basis in cattle marketing strategies

If the forward basis is **strong** (narrow), it signals an opportunity for a forward contract. This could be either done through a basis contract or a flat or forward price contract. In a basis contract, a basis could be locked in and the futures would be priced later. For example, an $8 under August basis contract, for slaughter cattle to be delivered in August, could be offered by a buyer at any time between January and say, May. The final price of the cattle is determined at a later date by locking in the August Live Cattle or August Feeder Cattle futures at any time before the cattle are delivered.

Similarly, during times of a strong forward basis and high or relatively high futures prices, a producer selling finished cattle, could use a forward or flat price contract. In this situation, a flat price contract locks in the specific futures contract price, the currency exchange rate and a strong basis.

A **weak** (wide) basis it signals an inability of the industry to move product compared to the supply of cattle. Often this happens when locally too many cattle are available for the current or expected demand. Large cattle supplies push cash prices lower and weaken the basis. Often, fed cattle producers choose to hold their cattle during this time, resulting in over-finished animals facing weight discounts. A good strategy is to market cattle on time, before they are over-finished, and possibly gain a premium for delivering a well-finished animal in a market filled with over finished animals. In this situation, the actual basis will be stronger for the producer selling animals that are not being discounted.

Also, a weak basis level in the fed cattle market can be a signal to buy feeder cattle. Since feeder cattle prices are influenced by the slaughter cattle market, the weak fed cattle basis will often translate into lower feeder cattle prices, possibly making the feeders a good buy. (See the module *Predicting Feeder Cattle Prices*).

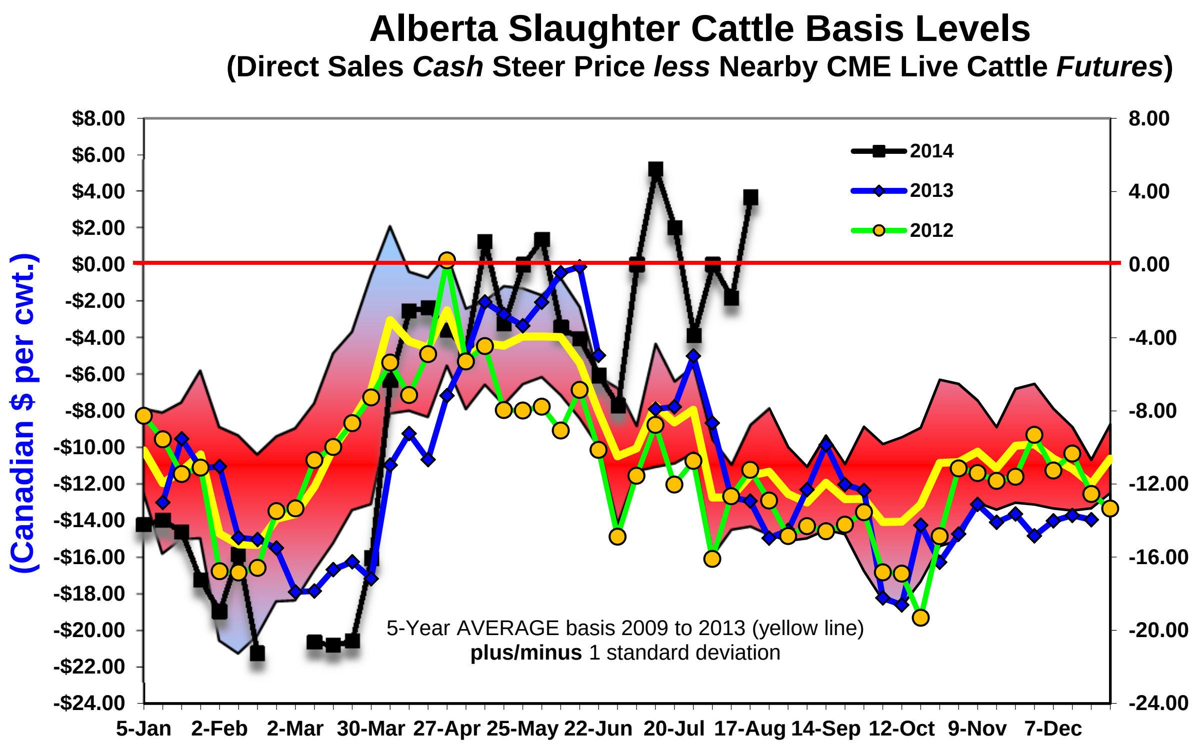
A weak basis may also be a good time to hedge cattle using the futures market. This would be appropriate if the producer wants to lock in a forward price at a time when forward basis levels are weak. Futures markets often turn lower when there is a prolonged weak basis. Therefore, careful analysis of over-all basis levels and price expectations should be undertaken.

Basis Risk in Livestock Markets

In grain markets, basis risk is usually less than futures price risk. That is, basis changes are usually less than changes in the futures price. This means that acting on pricing opportunities based on a basis level is usually a sound risk management strategy for grain producers.

However, in Canadian livestock markets the basis risk is NOT always less than the futures price risk. This is because livestock markets deal with a non-storable commodity. As slaughter cattle reach market weights, they must be sold or suffer discounts. This will push the cash market lower, and weaken the basis. The cost of gain for Canadian feeder cattle can be different than the cost of gain in the US. Higher cost of gain in Canada can push Canadian feeder cattle prices down without affecting US feeder cattle futures. That situation would usually weaken Canadian feeder cattle basis levels.

Reading Historic Basis Charts



Source: CME; Canfax; Economics & Competitiveness Division, ARD

The chart above, titled, Alberta Slaughter Cattle (Steer) Basis Levels was prepared in August, 2014. It shows historic and current basis levels for Alberta slaughter steers. The solid yellow line shows the weekly average slaughter steer basis for the five-year period from January 2009 through December 2013. The shaded area shows the best and worst basis during the same 2009 through 2013 period but leaving out the extremely strong or weak levels.

The light green line with orange circles shows the average weekly 2012 basis. The blue line with blue dimond shows 2013 basis levels while the black line with black squares shows average 2014 slaughter steer basis. It is useful to compare 2014 basis levels with 2012 and 2013 and to the 2009-13 average and the period's strongest and weakest levels.

Notice that there is a seasonal pattern to slaughter steer basis levels and that each individual year may or may not follow that seasonal pattern.

Conclusion

Basis risk is NOT always less than price risk in livestock markets. Pricing strategies using basis levels are part of a successful marketing approach. However, basis strategies should not be used without understanding the relationships between different market forces. It is important for producers to calculate their own basis levels every time they sell cattle.

Further Information

Alberta Agriculture and Rural Development
“Marketing Manual” - Predicting Feeder Cattle Prices
http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sis10943
“Marketing Manual” – Forward Contracting of Cattle -
http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sis11785