

Beef Cattle Retained Ownership Analysis

Web-Based, Decision-Support Tools



A cohort of grass-finish beef cattle at Mealani Research Station, Kamuela, Hawai'i Island. Photo by Mark Thorne.

At a Glance

The two main objectives of this fact sheet are:

- 1) to explain a method for reducing some of the uncertainty with cattle prices when the sale will occur months in the future; and
- 2) to introduce web-based, decision-support tools that can help Hawai'i cattle producers quickly analyze the potential returns and risks from various retained ownership alternatives.

Hawai'i cattle producers face additional uncertainty in retaining ownership on the U.S. Mainland, as ocean/air freight rates and availability vary. There may also be uncertainty in finding partners on the Mainland whose pasture, background, or feedlot operations are a good fit for Hawaii cattle that may arrive at a lighter weight than most other cattle they receive.

Introduction

Cattle producers frequently must make the decision to either sell their calves at weaning or, soon thereafter, retain ownership of the calves through a background/growing phase (typically on harvested forages, pasture, corn stalks, or other crop residues). Then, the cattle are either sold or retained into a finishing feedlot program.

While the price they might receive at weaning may be known, there is great uncertainty about what cattle prices might be at the end of the retained ownership program. The sale date may be 60 to over 200 days in the future – and much can change in that time. Uncertain prices lead to uncertain returns, which discourage many producers from considering retained ownership.

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The Hawai'i Cattle Producers Cooperative Association is an example of a group that was formed to help manage and minimize some of these risks.

Futures-Based Price Forecasts

What is the best way to predict or forecast cattle prices for next month, three months from today, or even eight months from today? One approach is to expect whatever price you last received to be the price you will next receive. This is known as a “naïve forecast” and sometimes it can be fairly accurate. Another is the “coffee shop method” of talking to neighbors and identifying agreement on what they think prices might be. The accuracy of this method may depend on your “coffee shop.” Another is to consult with market experts, and possibly paying fees to receive “expert forecasts.”

Research over the last 40 years has shown that, looking at Chicago Mercantile Exchange (CME) Feeder Cattle or Live Cattle Futures prices and then adjusting them to your local cash price level will generally provide the most accurate forecast method (Just and Rausser, 1981; Kastens et al. 1998; and Poghosyan, et al. 2021).

The futures market for cattle, like any agricultural commodity, is efficient and unbiased in the long run. The markets capture information from last period, from multiple “coffee shops” (many individuals expressing their opinions through buying and selling the futures markets) and from the “experts”. No single “expert” or “coffee shop” group can consistently outperform the futures market in terms of price forecast accuracy. The most accurate forecast, cited by the three research studies above, tends to be obtained by taking the current futures market price for the time you intend to sell and then adjusting that by a fixed amount to “localize” it for the market where you plan to sell.

“Basis” is defined as the difference between a local cash price and the CME Feeder Cattle Futures Price for feeder cattle, or the CME Live Cattle Futures Price for fed or finished cattle. The research shows that if you know the historical basis information for a given market, then your most accurate forecasts tend to be obtained by calculating the 5-year average basis and adding that number to the current CME Futures Price for the month in which you intend to sell.

Here is a quick, practical example:

Suppose it is now March 2022, and you plan to ship 425-lb. steer calves in April to Washington state to be fed on pastures there until September, at which time you plan to sell them at 650 pounds. Table 1 lists the last 5-year prices for 650-pound steers in Washington and the CME Feeder Cattle futures prices for September. Basis is calculated for each year, and the 5-year average basis is calculated to be \$1.23/cwt. or \$.0123/lb.

Table 1. Historical September Washington State Cash Prices for 650-lb. Steers, CME Feeder Cattle (FC) Prices, and the Calculated Basis (All Prices are in \$/cwt.)			
Year	September Cash Price	September CME FC Price	September Basis
2017	146.03	149.38	-3.35
2018	161.25	155.02	6.23
2019	141.54	138.09	3.45
2020	144.66	141.15	3.51
2021	151.91	155.62	-3.71
Average			1.23

You look up Feeder Cattle prices from the CME website and find that in March, the September contract is currently priced at \$183.60/cwt. Figure 1 is a screenshot of the CME Feeder Cattle Futures – Quotes for a specific day. Your forecast price for a 650 lb. steer in Washington is that futures price plus your historical average basis from Table 1: \$183.60 + \$1.23 = \$184.83/cwt. or \$1.85/lb.
















MONTH	OPTIONS	CHART	LAST
 MAR 2022 GFH2			159.450
 APR 2022 GFJ2			163.800
 MAY 2022 GFK2			169.750
 AUG 2022 GFQ2			181.775
 SEP 2022 GFU2			183.600

Figure 1. CME Feeder Cattle Prices

How accurate will this forecast price be? You won't know until you actually sell the steers in September. Will this retained ownership venture have a positive net return? What are your shipping costs? What could you sell the calves for in Hawai'i? What are your feeding costs? How much risk is involved? The web-based, decision support tools described in the next section are designed to help you answer some of these questions.

Web-based, Decision-Support Tools

Six different web-based decision support tools have been developed to enable Hawai'i cattle producers to analyze a number of different Mainland retained ownership alternatives. Before describing each of the different tools, the general principles used in all six models will be outlined.

The tools are constructed so that producers only need to enter minimal data. A number of calculations are done by the tool and ultimately, net return and return variability are predicted for the retained ownership alternative. Producers enter current market data: date, cattle weights, and current price if cattle were sold at that time rather than being retained. The producer enters data about shipping and the retained ownership alternative: shipping cost, expected death loss, days in the retained ownership program, expected weight gain, and expected costs for the retained ownership program.

Although the prior section is rooted in the concept of basis, basis is not constant from year to year. Basis also varies from month to month, by weight of feeder cattle, and from one market location to another. Futures market prices can vary up and down within a single day and over the months as market conditions change. From the start to end of a retained ownership program, prices could easily increase or decrease by \$10/cwt. (\$.10/lb.) or more.

Generally, the longer the retained ownership program, the more risk that futures prices will move much higher or much lower. The tools analyze historic basis data (adjusting for month, weight, and market location) and futures market variability, and then simulate 1,000 different market scenarios with this data. The result is an average expected return for the retained ownership scenario and a graphical and numerical estimate of how much those returns may vary from the expected return. The graph represents potential risk and depicts how much net returns could decrease or increase due to market volatility.

These tools are designed to capture your cash (out of pocket) costs and give the user a quick look at potential returns to assist in the retained ownership decision. They do not consider all "economic" costs (depreciation, return to management, time value of money, etc.), or how profitable it is to raise calves and sell them at the Hawai'i Gate Price. Faculty at UH (Cox et. al, 2006) previously developed a [Fact Sheet](#) & spreadsheet ([CALF-XL](#)) that can determine the cost of production and profitability of raising calves in Hawai'i.

Specific Decision-Support Tools

There are six different decision-support tools available, based on the specific stage of the retained ownership alternative, as well as on the market area. Two general market areas are considered: West Coast and Southwest. The West Coast tools are based on price data from Washington state, while the Southwest tools are based on price data from Texas. Both tools can be found at the [Hawai'i Rangelands](#) website, on the [Beef Cattle Retained Ownership Decision Support Tool](#) page.

The **Stocker I West Coast** tool is designed to look at an initial retained-ownership program on the West coast. It assumes that calves are weaned in Hawai'i and then shipped to the West Coast to be retained there in a background/growing feedlot or grazing/stocker program. Web link to tool: [Stocker I West Coast](#)

The **Stocker I Southwest** tool is designed to look at an initial retained-ownership program in the Southwest. It assumes that calves are weaned in Hawai'i and then shipped to the Southwest to be retained there in a background/growing feedlot or grazing/stocker program. Web link to tool: [Stocker I Southwest](#)

The **Stocker II West Coast** tool is designed to look at a potential 2nd phase retained-ownership program on the West coast. It assumes that calves are completing one phase of retained ownership on the West Coast and will be retained there in a second, but different, background/growing feedlot or grazing/stocker program. Web link to tool: [Stocker II West Coast](#)

The **Stocker II Southwest** tool is designed to look at a potential 2nd phase retained-ownership program in the Southwest. It assumes that calves are completing one phase of retained ownership in the Southwest and will be retained there in a second, but different, background/growing feedlot or grazing/stocker program. Web link to tool: [Stocker II Southwest](#)

The **Finisher West Coast** tool is designed to look at a feedlot finishing retained-ownership program on the West coast. It assumes that calves are completing a phase of retained ownership on the West Coast and will be retained there in a finishing feedlot program.

Web link to tool: [Finisher West Coast](#)

The **Finisher Southwest** tool is designed to look at a feedlot finishing retained-ownership program in the Southwest. It assumes that calves are completing a phase of retained ownership in the Southwest and will be retained there in a finishing feedlot program.

Web link to tool: [Finisher Southwest](#)



Notes on Using the Tools

- A producer may go directly from a Stocker I program to a Finisher program and not use the Stocker II tool.
- If a producer sells cattle after an initial stocker retained ownership program, they would not need to look at the other tools.
- The net return shown in each tool is only the return associated with that phase of retained ownership:
 - Stocker I, Net Return, is the return (positive or negative) compared to the initial value of the calf, based on the user entered Hawai'i Gate Price;
 - Stocker II, Net Return, is the return (positive or negative) compared to the initial value of the feeder calf entering that phase of retained ownership; and
 - Finisher, Net Return, is the return (positive or negative) compared to the initial value of the feeder calf entering the finishing feedlot phase of retained ownership.
- If a producer retained ownership in multiple phases and used more than one tool to estimate returns, the total return (positive or negative) compared to the value of the weaned calf in Hawai'i is determined by summing the net returns from each tool used.

Tool Example

An example of the Stocker I West Coast tool, when filled-out, is shown in Figure 2. (Use the red letters adjacent to Figure 2 as a guide to help follow the discussion below). The values match the example provided earlier in this fact sheet when basis forecasting was discussed. Producers must enter the data in the green boxes. Values in the light blue boxes are calculated by the tool. Clicking "CME Feeder Cattle" link will take the user directly to the [CME Feeder Cattle Futures Quote](#) webpage, where the most current prices are displayed (Figure 2a).

Very limited historical price data is available for Hawai'i gate prices. That limited data is used to make an estimate of the Hawai'i gate price, but the accuracy may be questionable in some time periods and for producers selling smaller versus larger lots of calves. This explains why there is a specific user green box to either accept the suggested gate price or to enter your own (and perhaps more accurate) gate price (Figure 2b). If you feel you will get a premium, or a discount, at selling time, you could also depict that by just changing the futures market price you enter by that same amount. Also, if you have a fixed price contract at the time of selling, you could adjust the futures price to reflect that price (Figure 2c). However, the tool will still calculate risk as if there is uncertainty in the output price.

These web-based decision support tools are all fully interactive and responsive. Changing one green box value will automatically change all light blue values that are impacted by that change. The numbers associated with the graph depicting risk will change as you change values (Figure 2.d.). This allows you to quickly see how sensitive your net returns are to changing various values.

The expected net return of \$177 per head is the return above selling the calf for \$120 per cwt. or \$510 per head in Hawai'i. While \$177 per head is the expected return, the graph illustrates that your actual net return per head could be less than \$100 per head or greater than \$400 per head. With this retained ownership scenario, 90% of the time, you would expect your net returns to be between \$26 and \$329 per head. This level of risk in your returns is real. Producers who routinely retain ownership know that in some years, they make a decent return, in some years they make a very large return, and in some years, they lose money.

Hopefully, these decision-support tools will allow you as a producer to examine several retained ownership alternatives and make more informed decisions about how you want to market your cattle. The validity of the tools is only as valid as the data you enter, and there is no guarantee of the expected return.

Hawaii Market Information

What Month do you plan to ship cattle from Hawaii to the mainland?

What is the anticipated weight of the calves you will ship? lbs.

Click Link below for Futures Prices

Enter the "Last" price for CME Feeder Cattle in \$/cwt. [CME Feeder Cattle](#)

An estimate for the Hawaii gate price is per cwt. or per head

Enter the estimated gate price or your expected gate price. per cwt.

Enter your estimated shipping cost to the destination on the mainland

Ocean/Air Freight /head

Trucking Freight /head

Stocker/Background program

Enter the number of days cattle are expected to be in this program days

Enter the expected average daily gain of this program lbs.

Assuming a 3% transportation shrink, estimated ending weight is lbs.

Click Link below for Futures Prices

Enter the "Last" price for CME Feeder Cattle in \$/cwt. [CME Feeder Cattle](#)

Your West Coast price is estimated to be per cwt. or per head

Estimated feed/pasture costs per head /head

Estimated vet/med and other supplies per head /head

Estimated death loss percent (including death loss for transportation)

Interest rate you pay on cattle and feed expenses

Any additional costs per head /head

Total feeding period costs /head

Projected Returns per Head

Estimated gross return for feeding period ending in /head

Less initial calf cost /head

Less transportation costs /head

Less feeding period costs /head

Estimated net return per head for the stocker/background program /head

This return is the positive return compared to selling at the Hawaii Gate price.

If you want to know your overall profitability, you would need to know your cost of running a cow and raising the calf. See the following publication and Excel workbook: [Publication](#) [Calf-XL](#)

Cattle prices change over time due to changing market conditions. The graph below is a simulation of your expected Net Return per Head based on historical price volatility in the feeder cattle market for the time frame of the designated feeding period.

The Expected Net Return is \$177 per head.

67% of the time Net Return is expected to be between \$88 and \$266 per head.

90% of the time Net Return is expected to be between \$26 and \$329 per head.

Figure 2. Screen Shot of the Stocker I West Coast tool, filled-out. A) CME Feeder Cattle link, B) green box has the suggested gate price or enter your own gate price, C) adjust the futures price here if needed, and D) associated graph depicting risk.

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