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Basis Data for Forward Pricing Live Beef Cattle in Oregon-Washington



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BASIS DATA FOR FORWARD PRICING LIVE BEEF CATTLE
IN OREGON-WASHINGTON

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Carl O'Connor, John Carpenter, James Cornelius

SUMMARY

The primary purpose of this pamphlet is to provide historical basis information about live beef cattle in Oregon-Washington markets. This publication presents weekly arithmetic mean, low, and high basis values for 900 to 1,100-pound Choice steers in Oregon-Washington represented by direct sales and auction markets, as reported by USDA Market News Service, Moses Lake, Washington.

The basis values are shown in Tables 1-6. To find the basis figures for a certain date, locate the chart with the nearby contract month, find the line for the date, then read the basis figures from the Oregon-Washington column.

To use the basis values in estimating a live beef cattle price with a hedge, follow the procedure outlined in Worksheet 1.

INTRODUCTION

If you are a feedlot operator who sells fat cattle, a packer who buys cattle, or a lender involved in financing a feeding operation, you probably are aware of the live beef cattle futures market on the Chicago Mercantile Exchange.^{1/} You may also be aware that by placing a hedge, you can use the futures market to assure the approximate price of specific livestock which will be marketed later. For example, the feedlot operator may hedge, and in doing so, establish the approximate price he will receive for his live cattle when finished at the time they are placed on feed. Or the hedge can be placed and the approximate realized finish price ascertained anytime while feeding the animal. On the other hand, a meat packer may hedge and establish a price or cost in advance for live cattle that he intends to purchase any time during the next 12 months.

^{1/}A summary of the live beef cattle contract on the Chicago Mercantile Exchange is on page 14.

But the decision whether to hedge live beef cattle is one that should be considered carefully. The basic steps in hedging are: (1) determine the hedging objective; (2) determine the expected price relationship between the futures price and the local cash price for the livestock (determine the basis); (3) estimate potential costs and returns; (4) make the hedging decision, and (5) complete the hedge.

This publication provides the needed basis information for live beef cattle in Oregon-Washington.^{2/} Basis is the most important key to effective hedging. Basis estimates are necessary to localize the Chicago Mercantile Exchange futures price to your marketing location. Once the hedge has been placed, and with hedging costs given, any difference between the expected and realized price always results from the difference between expected and realized basis.

HOW TO USE THE BASIS TABLES

Basis information for Oregon and Washington is in Tables 1-6.^{3/} The following example will illustrate how to find the information needed:

Example. Suppose Sam Smith feeds cattle on a farm near Hermiston, Oregon. It is September, and Smith has decided, after a thorough economic evaluation, to place 40 steers on feed. He expects to market the steers as slaughter cattle about February 12, or about six months. He is trying to decide whether to hedge the cattle by selling a live cattle futures contract on the Chicago Mercantile Exchange. To make the decision, Smith needs an estimate of the price he might expect to receive if he hedges. Making such an estimate requires information about the basis.

The necessary basis information can be found by the following procedure:

Find the table and line. Find the basis table which includes the approximate expected date the cattle will be marketed.

Smith should choose a line in Table 1 that presents information for the week of February 12 (page 7).

^{2/} Direct sale and auction markets reported by the USDA Market News Service, Moses Lake, Washington.

^{3/} See page 13 for information on how basis was calculated.

Find basis values. The high, low, and average basis values for each marketing date appear in the righthand column. The top value is an average (arithmetic mean) basis value over several years. The bottom values in parentheses are the low and high extremes during the same years. These show the range of basis values in other years. The average basis value Smith should use is $-.67$; the low and the high values are -3.50 and 1.55 .

Other tables. The figures in other lines in Table 1 give basis information for other dates between December 21 and February 20. Refer to another table if your expected marketing date is not within the range of dates covered by Table 1.

HOW TO USE THE BASIS VALUES

The following worksheet helps to illustrate the use of the basis values (from Tables 1-6 in conjunction with published futures prices) to calculate the approximate price a producer would receive for slaughter cattle if hedged.

Estimating price with hedge. Worksheet 1 outlines eight steps to be followed and applies them to the Smith example.

1. Determine which Chicago Mercantile Exchange live-cattle futures contract option you should sell if you hedge. First, estimate the date your cattle will be ready to be marketed. Then choose the option which matures nearest to, but not before, your estimated marketing date. The option you should use is identified by the title above the table in which your expected marketing date is found.

Smith would choose the February option (Table 1).

2. Obtain the current price from your broker or the Wall Street Journal for the live-cattle futures option you chose in step 1 above, and record that figure on line 2 of Worksheet 1.

Smith calls a commodity broker and is told that the closing price on September 1 for the February option is $\$85/\text{cwt}$.

3. Estimate hedging costs and estimate a price discount if you expect your cattle to fall short of the live-cattle futures contract specifications for weight and quality.

Worksheet 1. Estimating Your Slaughter Cattle Price if You Hedge: Example

Today's date: September 1, 1979 Estimated marketing date: February 15, 1980

1. Live-cattle futures contract option to be sold: February.
 2. Today's price for futures contract option to be sold: \$85.00 per cwt
 3. Hedging costs and price discount for weight and quality.
 - a. Brokerage fee \$0.10 per cwt
 - b. Interest on margin 0.15 per cwt
 - c. Price discount for weight and quality^{1/} 0 per cwt
 - d. Total \$0.25 per cwt - (\$0.25) per cwt
 4. Futures price less hedging costs and price discount \$84.75 per cwt
 5. Basis - (-0.67) per cwt
 6. Estimated local market equivalent price with a hedge (item 4 minus item 5) \$85.42 per cwt
 7. Local marketing costs - (\$0.50) per cwt
 8. Estimated net price with a hedge (item 6 minus item 7) \$84.92 per cwt
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^{1/}Chicago Mercantile Exchange contract specifications call for 1,050 to 1,250-pound steers that grade U.S. Choice and hot yield at least 62 percent. Choice steers with an average weight between 1,125 and 1,200 pounds will have an estimated hot yield of at least 63 percent.

Hedging costs include a brokerage fee and interest on the required margin deposit. Estimate the interest, taking into account the amount of margin initially required and the length of time the hedge will be maintained.

Live-cattle futures contract specifications on the Chicago Mercantile Exchange call for USDA yield grade 1, 2, 3, or 4 Choice quality grade live steers averaging 1,050 to 1,200 pounds with no individual steer weighing more than 100 pounds above or below the average. For cattle not expected to meet these specifications, estimate an appropriate price discount. Smith estimates brokerage costs at \$.10/cwt., interest costs on the margin deposit at \$.15/cwt., and he expects his cattle to meet contract specifications for weight and quality (making the price discount zero). Thus, his hedging cost and discount total is \$.25/cwt. Record this figure in the parentheses in the right column on line 3d.

4. Subtract the total in parentheses on line 3d from the current futures price on line 2.

In the example, the result of this subtraction is \$84.75/cwt.

5. Obtain the average basis value for your expected marketing date and market area from the appropriate basis table and enter it in the parentheses on line 5. (If the number is preceded with a minus sign, enter the sign also.)

Smith should use -0.67 /cwt. (February 12 marketing date, Oregon-Washington area)

6. Subtract the amount in parentheses on line 5 from the amount on line 4. (Important: If the amount inside the parentheses on line 5 is preceded by a minus sign, add the figures on lines 4 and 5 instead of subtracting to get the correct result. This is because the minus indicates cash prices at Moses Lake averaged higher than the Chicago Mercantile Exchange futures prices on corresponding days.) The result is the estimated "local market equivalent" or "localized" futures price.

Smith's estimated local market equivalent price is \$85.42/cwt.

7. Estimate your local marketing cost. This is the total of the transportation, shrink, and other marketing costs which normally would be incurred in selling locally.

Smith's estimated local marketing cost is \$.50/cwt.

8. Subtract the amount on line 7 from the amount on line 6. The result is an estimate of the net price available by hedging. Smith's estimated net price with a hedge is \$84.92/cwt.

Range of price estimates. The price on line 6 of the worksheet is only a single estimate of the local market equivalent price you will receive if you hedge, and the price on line 8 is a single estimate of the net at-farm price you will receive. These figures were obtained using the average basis. To get an idea of the range of prices you should expect, rework steps 5, 6, 7, and 8, first using the low extreme basis value and then the high extreme basis value for your expected marketing date and area.

For the Smith example, the estimated local market equivalent price (line 6), using the low extreme basis (-\$3.50/cwt.), is \$88.25/cwt. For the high extreme basis (\$1.55/cwt.), the amount on line 5 is \$1.55/cwt., and the local market equivalent price is \$83.20/cwt.

Hedging decision. The prices on lines 6 and 8 of the worksheet, or even the ranges of these two prices, probably will not provide all the information necessary to decide whether to hedge. It will be helpful, for example, to compare the price available by hedging with an estimate of the price you possibly would receive if you do not hedge. To do this, obtain a price forecast for your local market, perhaps using current outlook information, and compare it with the price on line 6 of the worksheet. Also, it may prove helpful to compare the price on line 6 with the forward contract price a packer is offering for cattle delivered locally on your expected marketing date. Finally, you will need to compare the alternative price estimates with your estimated cost of production to assess overall profitability (or loss minimization).

Table 1
 900 to 1,100-Pound Choice Steers
February Option ^{a/}

Weekly cattle basis for Oregon-Washington (for each date, top amount is 1972-79 average basis in dollars per hundredweight; bottom amounts in parentheses are low and high basis values during 1972-79).

Date	Oregon- Washington
DECEMBER 23	- ^{.07} (-2.20, 1.72)
DECEMBER 30	. ¹⁵ (-1.70, 1.35)
JANUARY 8	- ^{.04} (-1.85, 1.35)
JANUARY 15	- ^{.14} (-2.30, 1.35)
JANUARY 22	- ^{1.11} (-4.25, .80)
JANUARY 29	- ^{.52} (-2.85, 1.32)
FEBRUARY 5	. ²⁶ (-1.35, 1.90)
FEBRUARY 12	- ^{.67} (-3.50, 1.55)

^{a/} The January delivery month was added in 1977. Because of relatively small use (open interest), this delivery month is not considered a viable hedging alternative and is not included in this report. However, open interest is increasing, and hedgers may want to consider this delivery month in the future.

Table 2
900 to 1,100-Pound Choice Steers
April Option

Weekly cattle basis for Oregon-Washington (for each date, top amount is 1972-79 average basis in dollars per hundredweight; bottom amounts in parentheses are low and high basis values during 1972-79).

Date	Oregon- Washington
FEBRUARY 19	-.30 (-2.90, 1.92)
FEBRUARY 26	-.20 (-2.45, .80)
MARCH 4	.26 (-1.04, 1.92)
MARCH 11	.32 (-1.80, 3.15)
MARCH 18	.30 (-3.00, 2.12)
MARCH 25	.26 (-1.00, 1.20)
APRIL 1	-.33 (-2.95, 1.30)
APRIL 8	-.96 (-3.33, .55)

Table 3
900 to 1,100-Pound Choice Steers
June Option

Weekly cattle basis for Oregon-Washington (for each date, top amount is 1972-79 average basis in dollars per hundredweight; bottom amounts in parentheses are low and high basis values during 1972-79).

Date	Oregon- Washington
APRIL 15	.25 (-1.10, 1.60)
APRIL 22	.27 (-1.25, 3.15)
APRIL 29	.71 (-1.20, 3.85)
MAY 6	-.21 (-2.25, 2.00)
MAY 13	-.32 (-2.10, 1.60)
MAY 20	-.23 (-1.63, 1.05)
MAY 27	-.36 (-2.70, 1.40)
JUNE 3	-.08 (-3.43, 2.70)
JUNE 10	-1.16 (-4.28, 1.07)

Table 4
 900 to 1,100-Pound Choice Steers
August Option

Weekly cattle basis for Oregon-Washington (for each date, top amount is 1972-79 average basis in dollars per hundredweight; bottom amounts in parentheses are low and high basis values during 1972-79).

Date	Oregon- Washington
JUNE 17	-1.37 (-4.40, .60)
JUNE 24	-1.58 (-4.95, .80)
JULY 1	-1.75 (-5.80, .32)
JULY 8	-1.82 (-6.95, 1.00)
JULY 15	-1.08 (-4.80, 3.35)
JULY 22	-1.09 (-6.35, 3.45)
JULY 29	-.11 (-3.45, 7.05)
AUGUST 5	-1.02 (-8.05, 5.52)
AUGUST 12	-.53 (-2.35, 1.56)

Table 5
 900 to 1,100-Pound Choice Steers
October Option

Weekly cattle basis for Oregon-Washington (for each date, top amount is 1972-79 average basis in dollars per hundredweight; bottom amounts in parentheses are low and high basis values during 1972-79).

Date	Oregon- Washington
AUGUST 19	- ^{.07} (-1.98, 1.67)
AUGUST 26	- ^{.54} (-3.25, 1.35)
SEPTEMBER 2	- ^{.82} (-3.73, 1.20)
SEPTEMBER 9	- ^{.66} (-3.10, 1.37)
SEPTEMBER 16	- ^{.36} (-2.75, 1.80)
SEPTEMBER 23	- ^{.85} (-6.93, 1.90)
SEPTEMBER 30	- ^{.03} (-.65, .40)
OCTOBER 7	. ³⁷ (-.95, 2.65)
OCTOBER 14	. ⁸⁵ (-2.25, 2.42)

Table 6
900 to 1,100-Pound Choice Steers
December Option

Weekly cattle basis for Oregon-Washington (for each date, top amount is 1972-79 average basis in dollars per hundredweight; bottom amounts in parentheses are low and high basis values during 1972-79).

Date	Oregon- Washington
OCTOBER 21	(-1.55, ^{.47} 2.80)
OCTOBER 28	(-.98, ^{1.14} 3.55)
NOVEMBER 4	(-2.63, ^{-.01} 1.57)
NOVEMBER 11	(-3.63, ^{-.05} 2.27)
NOVEMBER 18	(-3.18, ^{.23} 2.92)
NOVEMBER 25	(-1.30, ^{1.46} 4.85)
DECEMBER 2	(-1.63, ^{1.12} 4.10)
DECEMBER 9	(-2.45, ^{.08} 1.77)
DECEMBER 16	(-2.63, ^{-.43} 2.10)

HOW THE BASIS INFORMATION WAS COMPILED

Basis calculation. The first step in compiling the information in the tables was to calculate for each market the basis value for each week from 1972 through 1979. A representative day, Thursday, on which trading in both cash and futures markets took place, was selected. To calculate each basis value, each week's cash price was subtracted from the futures price.

The cash price used was the average price for USDA Choice, 900 to 1,100-pound slaughter steers at Oregon and Washington markets, as reported on direct sales or auction sales in Moses Lake, Washington, on the given day. This category was selected because prices were available, and because it most nearly matched the live futures contract weight and grade specification.

The futures price used was the closing price on Thursday of one of the six Chicago Mercantile Exchange live-cattle futures contract options. The option selected was the one closest to maturity (the "nearby" option) for each Thursday.

Some of the calculated basis values were positive amounts and some were negative. Positive figures occurred when the futures price was higher than the cash. If, however, the futures price was lower than the cash price, a negative basis value resulted.

Average, low, and high basis values. To summarize the basis values from past years for a given market and date, a simple average of the basis values was calculated. In addition, the lowest and highest values were identified.

Basis tables. Finally, the average, low, and high basis values for each date were entered in Tables 1-6. The arrangement is such that all dates for which the same futures option was used in calculating basis values for the 900 to 1,100-pound weight category are in the same table. Thus, Table 1 includes all dates for which the February option was used in calculating basis values; Table 2 includes all dates for which the April option was used, and so on.

CHICAGO MERCANTILE EXCHANGE LIVE CATTLE CONTRACT

The following outline summarizes the major characteristics of the live beef cattle (slaughter) futures contract traded at the Chicago Mercantile Exchange. Detailed information and recent contract changes may be obtained from the Exchange or a commodity broker.

<u>Delivery Months:</u>	January, ^{4/} February, April, June, August, October, December
<u>Trading Units:</u>	40,000 pounds (5 percent variation allowable, if delivery is made)
<u>Quality:</u>	USDA Choice grade steers; <u>Weights:</u> 1,050 to 1,200 pounds average (all cattle within 100 pounds of average). <u>Yield Grades:</u> 1, 2, 3, and 4 (no more than 8 head of 4's) <u>Dressing Yields:</u> 62 percent (1,050 to 1,125 pounds; 63 percent (1,125 to 1,200 pounds)
<u>Delivery Points:</u>	Omaha, Nebraska; Sioux City, Iowa; Joliet, Illinois; Peoria, Illinois; Guyman, Oklahoma
<u>Delivery Method:</u>	At approved stockyards (seller pays cost of yardage, commission, grading, feed, weighing, etc.)
<u>Maximum Daily Price Fluctuations:</u>	\$1.50/cwt. above or below the previous day's settling price.
<u>Last Trading Day:</u>	20th calendar day of the contract month or the last business day before it.

^{4/}The January delivery month was added in 1977. Because of relatively small use (open interest), this delivery month is not considered a viable hedging alternative and is not included in this report. However, open interest is increasing, and hedgers may want to consider this delivery month in the future.