

Cow/Heifer Investment Decision Discounted Cash Flow

Kenneth N. Wegenhoft
Extension Economist and Professor
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The current calf prices are generating healthy profits for producers. The high levels of prices are based upon a short supply of calves and very high demand for beef. The short supply of calves from the US herd is expected to last for several years into the future. Uncertainty concerning the timing of re-opening the border to imports of Canadian beef and cattle confuses the price outlook to some degree. Current and future domestic and foreign supply and demand will be influenced to some degree by food safety events, primarily BSE and its consequences.

Under these high price conditions it is natural for cattlemen to wonder about expanding their herd if they have or can get the resources (pasture, labor, money and management) to do so.

The often heard question is “How much can I pay for a bred heifer?”. It is understood that the unspoken part of the question is “And make money”.

The answer to this question requires projecting net cash income into the future and adjusting for the time value of money and risk.

In order to project into the future, assumptions about average calf prices, sale weights, weaning percentages, sales expense, cost of production, productive life of the cow and salvage value of the cow at the end of her productive life must be made. This allows net cash income from operations to be estimated. Different assumptions will give different results. After the annual net cash incomes are estimated, the future incomes are adjusted by the discount rate which is the sum of interest rates for the time value of money and risk.

Risk, in this case, is concerned with a price decline for calves and cull cows associated with a major market disturbance. The higher the chance for something big to happen, the higher the risk factor should be.

The Discounted Cash Flow (DCF) is the value in today’s dollars of the Cumulative Net Cash from Operations plus the Salvage Value of the Cull.

The DCF is the maximum amount that can be paid for a cow or heifer and earn the discount rate. An amount paid less than the DCF will result in higher profits while paying more than the DCF will reduce profits.

Figure 1 shows the Excel spreadsheet used to calculate the values in the following examples. The spreadsheet is available at www.agecon.lsu.edu/FarmManagement.htm

Figure 1. Example Excel Spreadsheet

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	1	2	3	4	5	6	7	8
Calf Weight	450	475	500	500	500	500	500	475
Price	\$ 1.1015	\$ 1.1037	\$ 1.1077	\$ 1.0689	\$ 1.0324	\$ 1.0185	\$ 1.0242	\$ 1.0362
Marketing Fees %	6%	6%	6%	6%	6%	6%	6%	
Weaning Percentage	82%	82%	82%	82%	82%	82%	82%	82%
Net Income	\$ 382.07	\$ 404.10	\$ 426.91	\$ 411.95	\$ 397.89	\$ 392.53	\$ 394.73	\$ 403.60
Cash Cow Expense/Year	\$ 215.00	\$ 218.23	\$ 221.50	\$ 224.82	\$ 228.19	\$ 231.62	\$ 235.09	\$ 238.62
Expense Increase/Yr.	1.50%							
Net Cash from Operations	\$ 167.07	\$ 185.87	\$ 205.41	\$ 187.13	\$ 169.69	\$ 160.91	\$ 159.64	\$ 164.98
Cumulative Net Cash from Ops.	\$ 167.07	\$ 352.94	\$ 558.35	\$ 745.48	\$ 915.18	\$ 1,076.09	\$ 1,235.73	\$ 1,400.71
Salvage Value of Cull								\$ 450.00
Time Value of Money	3.0%							
Risk Rate	3.0%							
Discount Rate	6.0%							
Disc. Cash Flow	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,375.99

Three examples involving the purchase of a bred heifer that will be in production eight years are presented in Table 3 below. The first and second calves will be slightly smaller than the following calves. A weaning percentage of 82% and marketing fees of six percent are assumed. The cash expenses of maintaining a cow is estimated to be \$215 with a 1.5 percent increase each year. A salvage value (value of cull cow) of \$450 is assumed. A time value of money of 3 percent and a risk factor of 3 percent is also assumed.

Table 1 below presents the current USDA Baseline Nation Farm Calf projection for prices to 2013. This projection represents steers and heifers of all grades and types. These are very good prices when compared to calf prices of the 1990's. The average for steers and heifers for 450-500 during the 1990's was about \$0.85 per pound.

Table 1. USDA Beef Baseline National Farm Calf Prices, \$/Cwt

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Price	108.67	110.15	110.37	110.77	106.89	103.24	101.85	102.42	103.62	104.65

The assumed calf weight distribution for three weight classes of calves is in Table 2 below. The weights represent the average weight of steers and heifers.

Table 2. Calf Average Weights

Calf	1	2	3	4	5	6	7	8
Heavy	500	525	550	550	550	550	550	525
Average	450	475	500	500	500	500	500	500
Light	400	425	450	450	450	450	450	424

Prices, calf weights, productive life of the animal and the cost of maintaining her are critical to determining the amount that can be paid for a bred heifer or young cow.

Table 3. Estimated Discounted Cash Flows for Cows Produced Different Weight Calves by the Number of Calves Produced

Calf	1	2	3	4	5	6	7	8
Heavy	\$622.19	\$801.44	\$987.08	\$1,146.55	\$1,282.91	\$1,404.99	\$1,519.45	\$1,632.68
Average	\$582.14	\$723.53	\$873.33	\$1,000.17	\$1,106.80	\$1,201.20	\$1,289.41	\$1,375.99
Light	\$542.09	\$645.63	\$759.58	\$853.79	\$930.69	\$997.42	\$1,059.38	\$1,119.29

More can be paid for a cow which will produce heavier calves because they generate a significantly larger cash income. Cows producing heavy calves (approximately 550 pounds) generate \$1,632.68 while cows producing average weight calves (approximately 500 pounds) generate \$1,375.00 for a difference of \$256.69. Light calf producing cows generate \$1,119.29 which is \$256.70 less than average weight calves. This assumes that the cow stays in the herd for eight years.

Cows that are expected to stay in the herd are shorter period of time do not generate as much income. Cows that produce five average weight calves are worth \$269.19 less than cows that produce eight calves (\$1,375.99 less \$1,106.80).

Also, expected prices are critical to the amount that can be paid. Table 4 below presents the estimated discounted cash for average weight calves at \$0.85 per pound. This was approximately the average calf price for the year 1991 to 2000. Prices were high in the early 1990's declined to lows in 1996 and started climbing thereafter. During that price period, what could be paid for a bred heifer was significantly lower, approximately \$500 (\$1,375.99 - \$872.34).

Table 4. Estimated Discounted Cash Flow for Average Weight Calves at \$0.85 per pound.

Calf	1	2	3	4	5	6	7	8
Average	\$499.84	\$558.57	\$624.97	\$684.99	\$739.09	\$787.71	\$831.27	\$872.34

The amount that can be paid for a bred heifer depends upon the individual producers situation. His forage and feed base determine to a great degree the sale weight of the calf. Prices received generally will reflect the weight and quality of the calf. A good cow with a sorry bull will not give a high value calf. The amount spent in the maintaining the cow and the years of life in the herd also influence the amount that can be paid.

Herds that produce heavy, high quality calves and keep their costs down can pay more for a bred heifer than herds with lighter weight, lower quality calves. Also, herds that average a longer productive cow life can pay more than herds that keep cows for a shorter period of time.

The Discounted Cash Flows are estimates of the maximum amount that can be paid and earn the discount rate. Paying less will generate higher returns, while paying more will reduce returns or create losses.