Feeder Associations of Alberta Ltd.

Breakeven Analysis for Feeder Cattle

Alberta Agriculture Market Specialists

Introduction

Breakevens are specialized partial budgets used to evaluate feeder cattle purchase and sale decisions. The decision to sell at weaning, to background, or to finish a calf should be reviewed constantly throughout the feeding period as prices and input costs change.

Why Breakevens?

Using breakeven analysis to help decide when to sell or buy feeder cattle have a number of advantages. Breakevens are easy to calculate. They relate specifically to a single farm, rather than provincial averages. They are an excellent way to compare different marketing options, such as selling weaned calves versus selling finished steers. Most important, breakeven prices reflect the current state of the market rather than long-term generalizations.

Be aware that useful breakeven prices depend on accurate knowledge of current calf prices, production costs, and possible future selling prices.

Table 1 presents a breakeven calculation for a feedlot backgrounding a 500 lb steer. The worksheet starts with the purchased calf and an estimate of the rate of gain. The ration fed is averaged over the time the calf is on feed and if more than one ration is used the cost can be divided into separate feeding periods.

The section '**Other costs**' should reflect costs on a producer's farm. Veterinary costs, yardage (including bedding, mineral, labour, machinery costs, etc.), death loss, and interest will vary from farm to farm and from year to year. Other costs such as insurance or special program costs can be included. Buying costs should include the costs of locating, purchasing and delivering the calves to the lot. In the case of feeder calves born on the farm or calves bought free on board (FOB), buying costs may be only the induction costs into the lot.

Selling costs are a bit more complex to calculate. In table 1, the projected sale price ($0.95/lb) is the producer's estimate of the price of the calf on the sale date. If the sale price used does not reflect shrink, commission and transportation, these factors should be deducted as selling costs (in this example, $45.60/head).

Shrink is included as a deduction if the sale weight of the calf is a weight at the lot rather than the actual weight at time of sale. Transportation, handling, access to feed and water and other factors will also affect shrink (see **How Shrinkage Affects Returns for Feeder and Slaughter Cattle**). If doubt exists about any of these costs, it is a good idea to estimate them on the high side.

Table 1. Feeder Cattle Worksheet (also available as a calculator).

Feeder value:	500 lb live wt	x	$ 1.05 /lb	=	$ 525.00 /head
Gain on feed:	150 days on feed	x	2.0 lb ADG	=	300 lb gain
Projected sale weight:	500 lb live wt (feeder)	+	300 lb gain	=	800 lb sale wt
Projected value:	800 lb sale wt	x	$ 0.95 /lb proj. sale	=	$ 760.00 /head
Feed costs:					
Hay	8 lb/day	x	$ 0.0226 /lb	=	$ 0.18 /day
Barley	8 lb/day	x	$ 0.0458 /lb	=	$ 0.37 /day
Supplement	0.5 lb/day	x	$ 0.12 /lb	=	$ 0.06 /day
Total daily feed cost				=	$ 0.61 /day
Total feed costs:	$ 0.61 total feed cost/day	x	150 days on feed	=	$ 91.50 /head
Other costs:					
Profit and risk margin					$ 5.00 /head
Veterinary, medicine and induction costs					$ 6.00 /head
Buying costs					$ 4.00 /head
Selling costs					$ 45.60 /head
Yardage	$ 0.15 /head/day	x	150 days on feed	=	$ 22.50 /head
Death loss	2.0 %	x	$ 525.00 /feeder	=	$ 10.50 /head
Interest on feeder	11% x $ 525.00 /feeder x1 50 days on feed ÷ 365			=	$ 23.73 /head
Total production cost:				=	$ 208.83 /head
Total cost per head:	$ 208.83 production cost	+	$ 525.00 feeder cost	=	$ 733.83 /head
Net profit per head:	$ 760.00 proj. sale value	-	$ 733.83 total cost	=	$ 26.17 /head
Cost per lb of gain:	$ 208.83 production cost	÷	300 lb gain	=	$ 0.70 /lb gain
Breakeven purchase price: ($760.00 proj. sale value - $ 208.83 prod. cost)		÷	500 lb feeder live wt	=	$ 1.10 /lb live wt
Breakeven sale price: $ 733.83 total cost/head		÷	800 lb sale wt	=	$ 0.92 /lb live wt
Breakeven sale price (railgrade): $ 0.92 /lb live wt breakeven		÷	0.56 dressing %	=	$1.64 /lb dressed

Breakevens are often calculated without a built-in profit margin, so pencil in a return to cover risk. **Table 1** uses a $5.00/head profit margin as a fixed minimum return, so any breakeven price has this advantage built-in. Consider it as a cushion to cover for unseen errors or miscalculations. The higher the debt load of an operation, the more valuable this kind of margin is. A normal range for fixed profit margins is $5 to $35/head.

Profit Versus Prices

After all costs of production and selling are totalled, the results can be used in a variety of ways. One of the most important figures is net profit per head, seen as $26.17 in **Table 1**. This value is dependent on the accuracy of both the purchase price and the estimated sale price. The $26.17 profit shown is over and above the $5/head fixed profit in the calculations. If the profit was $0/head, you would still have the $5 built in, but it would indicate a breakeven situation from a business point of view. A -$5 net profit would be the true breakeven, while a larger negative net profit would indicate a loss.

The breakeven sale price is the best estimate of the minimum price required to meet all costs of producing the sale animal. It is the total cost of production divided by the sale weight of the animal. This estimate is dependent on the accuracy of estimates of both expenses incurred and the purchase price of the calf. The breakeven sale price can be compared with available outlook information to judge the probability of making a profit.

The breakeven purchase price can be used to decide whether or not the purchase price of feeder calves is low enough to make a profit. The maximum price that can be paid for a feeder calf can be estimated by subtracting feeding and production costs from a projected sale price. In table 1, the 500 lb calf could be bought for $1.10/lb without a loss. However, at this price there is no additional profit over the $5 included as a profit and risk margin.

Profit Versus Sensitivity

The sensitivity of a breakeven projection shows how readily the estimated return is affected by change. A small change in one of the inputs results in a change in net profit per head (**Table 2**).

Table 2. Sensitivity of Feeder Budget in **Table 1**.

Change in Input (up or down)	Change in Net Profit/Head
1% death loss	$ 5.50
1% interest	$ 1.96
$0.01 / day yardage expense	$ 1.30
$0.10 / bu barley cost	$ 2.16
$5.00 / tonne hay cost	$ 2.60
0.1 lb gain per day (implant)	$11.00
$0.01 / lb purchase price	$ 5.29
$0.01 / lb sale price	$ 7.60
1% commission on sale	$ 7.22
1% shrink at sale	$ 7.22

Using table 2, if the interest rate were to go up or down by 1 per cent per year, net profit per head would change by $1.96 in the opposite direction. An increase in the interest rate would reduce the net profit. Grain prices increasing by $0.10/bu would cause a $2.16 decline in net profit per head.

This kind of analysis is useful for determining which input to alter to obtain a maximum return. For example, an increase in average daily gain from 2.0 to 2.1 lb/day as a result of using implants results in a $11/head increase in net profit, after the cost of the implant. There are other ways of improving gain such as genetic improvements, feed additives and improved rations, which can be highly profitable and justify the additional expense. The cost of the improvement (in dollars per head) can be easily judged using the sensitivity and analysis of breakevens.

Another consideration is sensitivity analysis is purchase price. In **Table 1**, the breakeven purchase price is $1.10/lb. A $0.01 movement up or down from that price results in a $5.29/head change in net profit or loss.

Producers should pay attention to the selling price and commission because they have the same dramatic effect on profit that purchase price does. If producers compare different commissions, they can take advantage of potentially higher local markets. Shrinkage will also affect the profitability of a sale. How cattle are handled, how long they are in transit and how long they must wait at auction markets are all factors that will affect shrinkage in cattle (see **How Shrinkage Affects Returns for Feeder and Slaughter Cattle**). Evaluating potential markets to reduce shrinkage as well as negotiating commission will affect profitability. A 1 per cent change in either commission or shrinkage is equivalent to a 3.6 per cent change in interest rates or about $7.22/head in net profit.

The high sensitivity of sale price emphasizes the importance of knowing the market trends and having access to outlook information. For example, if feeder cattle were purchased with the expectation of receiving a sale price of $0.95/lb, and the market moved down to $0.85/lb, returns would be reduced by $72.20 per head. By following the market and having a reasonable price expectation, producers will know how price changes will affect their returns.

Deciding when to sell a calf is difficult because of the time span between now and when the calf will ultimately be sold. Depending on the feeding regime and the calf, this may range from 60 to 360 days. The effects of a long feeding period, such as the need for additional feed, labour and facilities, must be judged for each operation.

To compare alternatives, all returns must be converted to a common base, in this case today's value at the farm gate (see **Farm Gate Value for Calves Placed Into a Home Feedlot**). To illustrate, consider a cow-calf producer with a pen of 500 lb weanling steers. The rancher must choose amongst selling the calves at weaning, backgrounding them to a heavier weight, or finishing the calves to slaughter. For simplicity, other options such as custom lots and export sales will not be considered.

To sell the calves at weaning through the local auction market the producer estimates:

Income		
500 lb x $1.05/lb		$525.00
Expense		
Shrink (5%)	$26.25	
Commission (3%)	$14.96	
Trucking	$ 2.50	
Total expense		$43.71
Net Income		$481.29

By his best estimate, that calf is worth $481.29 today. This farm gate value is a basic indicator that can be used to compare marketing alternatives. Now a series of breakeven calculations can be used to evaluate the opportunities of feeding calves to heavier weights.

Using the worksheet in Table 1, the best projection of the market price for 800 lb calves 150 days in the future is $0.95/lb yielding a net profit of $26.17/head. Because the breakeven worksheet includes trucking, selling costs and other expenses for the planned point of sale, this profit is already a farm gate value.

Comparing the additional profit and loss to the present selling value of the weaned calf will give an indication of the potential profit or loss from feeding the calf to a heavier weight. This assumes the producer is feeding calves from his own herd. If he is purchasing calves, he may use either the purchase price of the 500 lb calves as a base or a short feeding period (500-650 lb) as the base.

Table 3. Calf feeding alternatives past weaning.

Alternative	Potential returns or loss
sale at 800 lb	$26.17/head
sale at 900 lb	$ 9.73/head
sale at finish	$(0.50)/head

Having done several different breakevens for the calves, the producer can compare the different alternatives (Table 3).

In this case the farmer would consider backgrounding the calves to 800 lb as potentially the most profitable alternative. This decision would, of course, be tempered with practical considerations such as availability of feed, facilities, time, interest rates and labour.

Putting it all together

Several things must be considered when buying and selling feeder cattle. Even in marginal breakeven situations calves may be purchased to make use of existing facilities or labour, or for other reasons. These considerations can be included in the breakeven analysis to adapt the results to an individual farm situation. By using realistic estimations of costs and livestock prices, breakeven analysis can be a powerful tool for planning farm production and estimating future income.

Additional Information

1. Livestock Marketing Video Series
   available from
   Alberta Agriculture, Food and Rural Development
   Broadcast Media Branch
   7000 - 113 Street
   Edmonton, AB T6H 5T6
   (780) 427-2127
2. Alberta Agriculture's
   District Agriculture Video Libraries