

*Sell or Keep, Buy, Lease*

*Retained Ownership Decision Aids*

*For Beef Cow-Calf Producers*

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## **Sell or Keep, Buy, Lease: Retained Ownership Decision Aids For Beef Cow-Calf Producers\***

Cow-calf producers face the question of sale at weaning or to try some form of retained ownership ranging from a short backgrounding (preconditioning) to stocker or feedyard finishing. Maybe the grazing land would earn more leased out. Evaluating production and marketing alternatives helps provide “decision information.” Predicting prices, of course, is difficult. Marketing cost, production performance, and cost can be attained from past experience or published sources. This data is better generated internally from each experience. Accounting systems and production records need to be set up to generate historical performance information. All projections should be compared to actual results using close out information. Studying the past provides an understanding of the present situation and serves as a basis for future decisions.

### **Key Decision Information**

Growing and finishing cattle is by definition a margin business. It is value added versus cost of gain or added cost. The feeding or grazing margin is most frequently offset by a negative marketing margin or the difference of selling price and purchase price, referred to as the buy/sell margin, or rollback, as purchase cost of the lighter cattle is normally greater than sales price.

**Marketing margin** is the net payweight sales for the weaned calf or purchase payweight of the stocker (feeder) based on sales and inventory adjustments times buy/sell margin or the rollback or roll-up (positive or negative margins between cost of buying and selling price). For a negative marketing margin, the cost of gain has to be less than its market price (sales price) to have a positive net income.

**Grazing and/or feeding margin** is the sales price minus the cost of gain times the net payweight gain. It is a measure of how much the value of gain exceeds the cost of gain. Under normal buy-sell prices, there is a negative marketing margin. The grazing and/or feeding margin must offset this negative margin for the enterprise to generate a positive net income. To generate a profit, the marketing margin plus the grazing and/or feeding margin must be positive.

To accurately calculate these margins for evaluation of growing and finishing alternatives, decision makers need the following data:

- (1) Payweight of weaned calf, stocker (feeder) cattle
- (2) Payweight purchase cost of cattle
- (3) Net payweight when marketed
- (4) Payweight gain
- (5) Full cost of gain – all cost including overhead and interest cost
- (6) Payweight net sales price
- (7) Number of head sold net of death loss

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The formulas for calculating margins are as follows: \*\*

*Marketing Margin (\$hd) =*

$$(((\text{Total Purchase Payweight} * .01) * (\text{Sales Price} - \text{Purchase Cost})) / \text{Head Out})$$

*Grazing or Feeding Margin (\$ / hd) =*

$$((\text{Sales Price} - \text{Cost of Gain}) * \text{Net Gain} * .01) / \text{Head Out}$$

*Net Income (\$/hd) =*

$$\text{Marketing Margin} + \text{Grazing and Feeding Margin}$$

\*\* All prices and costs are in \$/cwt, weights are in pounds, and margins are dollar per head out. Payweight to payweights accounts for death loss.

The most important product of the cattle cost accounting system is the cost of grain as it measures both efficiency and competitiveness of the growing or finishing enterprise. The sum of marketing margin and grazing or feeding margin is profit per head.

## **Input Data**

To use the quick sell or keep analysis decision aid, type in the marketing cost data, production – gain, shrink, and death loss data and production cost data, capital requirement and financial cost (cash interest) and opportunity cost of capital tied up in keeping cattle. Existing values can be over-ridden by typing in a new number. Data entry cells are blue. All other cells are protected. The weaned calf price and sell price are critical determinants of the profitability. It is always advisable to do a “what if” analysis on the weaned versus sell price. The shorter the retained ownership and less cattle gain, the greater the impact the “weaned calf versus sell margin” will have on final results.

Caution must be taken in accounting for seasonal change in prices. See the cattle price slide calculator on the second page. That is, as weight increases, price decreases. Backgrounding, however, may result in improved cattle prices. A forward pricing arrangement normally specifies the price slide.

## **Nutrition Cost**

### Preconditioning and backgrounding

- Types of feed fed and projected quantities fed
- Cost of these different feeds
- Yardage or facilities cost
- The feed use and cost is the most important cost of this activity

Any feedyard will quote cost of gain, but the way costs are quantified is highly variable so caution must be taken in using this information. The areas of data needs are as follows.

- Ration cost on dry matter (DM) basis (\$/ton)
- Projected feed (DM) conversion and total feed requirement
- Yardage cost in addition to feed cost

The custom fed closeout decision aid provides for a summary of carcass data if it is provided for the lot.

In the retained ownership section of the cow-calf economics decision aids there are also more in-depth decision aids for comparing branded to conventional finishing and a detailed Feedyard Closeout Retained Ownership Alliance Evaluator.

Use the feedlot close out decision aid that is provided in this set of software to better understand feedlot data. This will provide a guideline for data and values to use in projections.

## **Purchase Cattle Analysis**

Many opportunities exist to purchase cattle and retain them through the different phases. The “purchase or not” decision aid helps guide the organization of numbers to evaluate the potential for a profitable investment. The same analysis criteria are used for purchased cattle as for owned cattle. Death loss and other performance levels could be expected to differ from owner-produced cattle. Obviously, this analysis needs to be done before a purchase decision is made. The close out analysis should be completed to determine if it was “one of those deals that should have worked” or if it was one that really achieved the targeted net margin.\*

## **Sell or Keep Cull Cows**

Cow-calf producers are frequently faced with the alternative of selling their cull cows at the time they are culled or feed the cows to a better grade or body condition score (BSC). Not only is there a difference in price by grade of cow, but also there is a seasonal price to contend with or take advantage of. Cull cows are lower in the fall as supplies are high as many producers

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\* Words of Don Keeling, rancher and order buyer, Pleasanton, Texas.

cull in the fall when they wean calves. Spring cull cow prices are normally higher as supplies are lower.

Recall that the impact on the marketing margin of a higher price associated with grade change or the cull cow market price is substantial because the initial weight, which is high relative to the final weight, generates a high marketing margin that can affect the production margin.

### **Close Out Analysis**

Projections over time are only as good as their ability to predict what actually takes place. Often, actuals are not even compared to projections, which is a loss of valuable information. Accounting systems should be set up to facilitate lot analysis, and “close out” information needs to be assembled into a consistent format so projections can be easily compared to actual achievements. Producers need to have the capability to sort out the production and marketing systems that perform up to expectations.

### **Results – Weaned Calf**

The expected value of the calf is the net market price and expected net weight of calves. If cattle are not sold at weaning, there is the unrealized sale value. Recall that the cost of producing the calf is not relevant in the decision of what method to market or retained ownership production alternative. The weaned calf cost is a sunk cost. It cannot be reversed at the time the “sell or keep” decision is made.

The second part of the analysis is to determine the weight gain and the total sales value of the marketing or production alternative to determine the difference in gross revenue. This is the marginal revenue (added revenue) associated with the alternative. To be a profitable “keep em”, the added revenue must offset added cost (marginal revenue must be greater than marginal cost).

The third part of the analysis is to project expenses associated with retaining the cattle. Cost per head and for cwt gain is calculated. Recall, gain costs are often very high when average daily gain is low. Also, recall that delaying sales means capital is tied up. If it is an actual loan, then it is the cash interest cost or the opportunity cost of capital (its use in the next best investment). Because of production and price risk involved, a “net margin per head objective” should be established. One should not take the price and production risk for nothing.

The target net margin per head objective is the amount of net income per head that would meet the producers’ financial performance objective. The software calculates the price necessary to achieve the target net margin objective and what this would mean in terms of annual return to capital in terms of the target version actual.

The reason for including a target return objective is producers in general do not have target price objectives, thus missing pricing opportunities or getting too focused on “cattle operation issues” without addressing pricing and return on investment issues.

Breakevens are often calculated with no returns to cover indirect costs, capital, or owner management. Using these incomplete cost values as a guide for pricing, if only achieved, will eventually break the business. Why set targets to go broke?

The calculated values are the financial (excluding opportunity cost of capital) and economic (including opportunity cost of capital) advantage of retained ownership.

The sales price of the retained ownership cattle to achieve the net margin objective provides a guide to understanding the net price necessary for an acceptable marketing and production alternative or for negotiating cattle price.

### **Summary Marginal Analysis**

As noted, retained ownership profitability is dependent on two margins, the marketing margin and the feeding or grazing margin. The summary report identifies these margins. In the short preconditioning / backgrounding phase, the marketing margin must offset the low-high cost gain. In the other phase, the cost of gain must be low enough to offset the expected negative marketing margin caused by the lower sales price relative to purchase cost (negative sell-buy margin).

### **Financial and Economic Advantage**

The financial advantage accounts for financial cost plus the net margin per head objective. The economic advantage includes the opportunity cost of equity capital. Annualized return compares the target margin plus the earned net to calculate the annual rate of return on capital and compares this to the target return.

### **Sensitivity Analysis – Cost and Price**

To facilitate the analysis of potential variation in cost of gain and/or in the price of cattle, the software generates a sensitivity table. The user can modify the scale of the cost or price intervals in the sensitivity table. The value calculated is the price of the cattle out that would cover cost and the target returns.

### **Retained Ownership Analysis Guide -- Key Definitions**

**Financial and Economic Advantage of Retained Ownership and Margins** is a measure of the financial and economic costs (including opportunity cost of capital) that is positive or negative. That is, is marginal revenue greater than cost? Net margin is based on head out. This margin shows the source of a positive or negative margin based on head out. Recall from the margin definition that net income can be positive only if the marketing margin can be offset by a positive feeding margin.

**Total Difference in Gross Revenue** is the difference between the net sales revenue generated and the unrealized sales value of the weaned calves. This is the added or marginal revenue.

**Total Sales Value** is the revenue generated after retained ownership, spending the added cost and time to produce the retained calves.

**Total Specified Added Costs** is the total cost including the target return (if a value is entered) for the retained ownership. This is the added or marginal cost of retained ownership. The marginal cost must be less than added revenue (marginal revenue) to make retained ownership profitable.

### **Annualized Net Return on Assets (Capital)**

**Financial ROA** is the annualized return on assets (ROA), including net margin objective, and is the net income plus cash interest cost plus the target margin objective divided by annualized capital (asset) requirement to support the enterprise. Capital is adjusted for the time cattle are fed.

The **economic ROA** would add back the entire opportunity cost of capital.

The reason interest is added back in the ROA calculation is that it had been calculated out in determining net income. Interest represents a cost of capital, so it must be added back to net income to calculate an income before interest to determine what net income is capital.

**Financial ROA** is the annualized return on equity. ROE, including net margin objective, is the net income plus the target margin objective divided by the annualized equity capital required to support the enterprise (capital required adjusted for time fed).

The ROA and ROE could be compared to alternative investments of similar risk for evaluation of the retained ownership investment.

This analysis, for simplification purposes, uses the same interest rate for actual interest and opportunity cost of capital or assets invested.

If actual return is above target capital return, it means the investment received “its opportunity cost” and target return is met. Difference between target and actual is how the target was surpassed. If the actual economic ROA is less than the targeted, then the target has not been met nor has the opportunity cost been received for the investment.

### **Guidelines On Interpretation of ROE/ROA**

When no capital is borrowed, financial ROA and ROE will be the same. Economic actual return will be lower because it accounts for an opportunity cost of capital (interest rate).

If the ROE/ROA ratio is positive and greater than one, then the return on debt is greater than its cost of debt (COD) (interest is less than earnings).

Using debt is favorable when  $ROE > ROA > COD$ .

To gain quick access to select definitions, move the cursor to the “red marker” on the spreadsheet cells.

## Examples

Examples are illustrated in Appendix B for the four applications of the same methodology, including evaluation of sales at weaning or:

- (1) Preconditioning,
- (2) Stocker grazing, or
- (3) Feedyard.

The fourth application example is **evaluation of leasing, grazing, or buying cattle** and using the grazing land. A decision aid to evaluate a cattle purchase or not to purchase cattle for retained ownership is presented in the same framework as owned cattle. There is a spreadsheet included to **close out** information from actual results. Summarizing the actual results to evaluate decisions made provides critical information for planning. The final application of the methodology is the evaluation of the alternative of **selling cull cows at culling time or feeding them** for a later time with improved grade and at a potentially better price.

Recall, all data are only for examples and must be modified to fit the decision situation.

## Head Day Calculator

Growing and finishing cattle producers often receive and sell cattle over a period of time. This makes it difficult to calculate the head days and average daily gain performance measures. The head day calculator facilitates summary of purchase (or retained ownership) and sales data for the closeout decision aids.

The software allows transfer of cattle across final years. The program offers options to calculate the number of days for animals culled, which assists in cost accounting by charging these cattle for days fed. Each lot can have an identification number (ID). The software accommodates entering data out of order by resorting data by ascending dates. This greatly facilitates checking the data entry. Data is sorted by clicking on the **Sort button**.

The transactional alternatives are illustrated in the following menu. The type of transaction that maintains the proper inventory is as follows:

### Transaction Types

#	Transaction Type
1	Beginning Inventory
2	Purchases
3	Retained Ownership – In
4	Longs
5	Cull Sales
6	Sales
7	Deads
8	Retained Ownership - Out
9	Shorts
10	Movement to 2 <sup>nd</sup> Year
11	Ending Inventory

**Ctrl T** can be used as a short cut to this table of transaction types; however, you must be in a cell in the Transaction Type column to use this feature. You can use the view menu to return to the Main Menu or to navigate between data and reports.

Dates are entered as month (MM), day (DD), and year (19xx). For example, May 25, 2001, is entered as 05/25/2001, and this will be reported as 25 May 01.

An example that follows illustrates the data requirements and reports. Users should pay careful attention to transaction dates and the actual transaction taking place. The inventory reconciliation report provides a good check of the data entry.

## Appendix A Definitions

**Preconditioning and Backgrounding** are often used interchangeably. This is the phase of production between weaning and selling or transferring to a stocker or finishing phase of production. Preconditioning is a 30 – 60 days period. Backgrounding is normally used to describe cattle that are confinement fed for a longer period between weaning and sale as feeders.

**Direct Expenses** are expense items that are directly related to a farm/ranch production activity such as fertilizer or veterinary supplies.

**Economic Analysis** includes the consideration of the opportunity cost of equity capital, owned land, and raised feed in the calculation of costs. The analysis serves as a guide to finding the optimal use of resources to generate the highest net income possible for the operation.

**Economic Cost** includes finished costs plus an opportunity cost. Opportunity cost represents the return that could be received for a resource in its next best use. Economic cost represents the cost if all resources earned their opportunity cost.

**Equity** is the difference between total assets and total liabilities. This gives an indication of the dollar amount actually owned by the operator and represents the capital base available to handle adversity.

**Feeding/Grazing Margin** is the backgrounded sales price minus the cost of gain times the net payweight gain. This is a good measure of cost of gain versus the sales value. Backgrounding is a high cost of gain activity because gains are normally low and the price is below cost of gain.

**Financial Analysis** focuses on determining the accounting cost, true profitability, change in equity, and repayment capacity of the enterprise or business being evaluated.

**Financial Costs** are expenses included in financial costs that are generated in the accrual adjusted income statements. They include cash costs, depreciation, and non-cash adjustments, such as accounts payable accrued interest, etc. The financial cost does not include opportunity cost of resources.

**Grazing Cost** is the financial cost for grazing land, including actual lease land expenses paid, real estate mortgage interest payments, depreciation, maintenance of improvements, and property taxes of owned land.

**Gross Gain and Average Daily Gain (ADG)** is the weight gain between weaning weight and the weight before shrink associated with marketing. This weight is adjusted for death loss as only live cattle are counted. Average daily gain is total gain divided by days on feed or grazing head times days fed.

**Gross Payweight Price** is the gross income from sale before adjustments for freight and marketing costs. Payweight is the net weight after shrinkage for the cattle.

**Marketing Margin** is the weaning weight times the rollback or rollup in price, or the positive or negative margin between initial weaned price and the sales price when backgrounded.

**Net Farm/Ranch Accrual Income** is the revenue earned minus the expenses incurred during the operating year, including the interest expense without regard to the exchange of cash. Net income is calculated after accounting for family living withdrawals (owner labor and management) and reflects the enterprise contribution to total farm or ranch income. For operations that pay salary and wages, this cost is included in operating costs. This is reported normally as a pre-tax net income and is not equal to IRS taxable income.

**Net Gain** is the difference between net sales or payweight and weaning weight.

**Net Margin** is the difference between the value of the backgrounded calf and the original value and added cost of backgrounding. The net margin is made up of two components, marketing margin and feeding/grazing margin.

**Net Payweight Sales Revenue** is the revenue received per cwt after shrink and all marketing costs are accounted for.

**Opportunity Cost of Capital** is the rate of return for the next best investment of return for the next best investment alternative with similar risk. If there is a business debt, the interest rate on debt is a good indicator of opportunity of capital.

**Owner-Operator Labor and Management Reflected as Family Living Withdrawals** is the cash paid for owner's labor and management services provided by the family. Family living withdrawals should be at a level equivalent to the salary required to hire a non-family member to provide an equivalent service. Actual withdrawals in excess of this amount must be considered capital distributions in order to reconcile the retained earnings and statement of cash flows. Family living withdrawals are used not only to calculate cost of production, but return on assets, return on equity, and repayment capital as well.

**Payweight In** is the net beginning weight.

**Payweight Out** is the net weight out after shrinkage (deads are in). In other words, it is net-to-net payweight.

**Profit (Loss)**. Great care must be exercised in reading reports in the cattle sector labeling the value profit or loss. Most frequently in feedyard and other cattle reporting, these numbers are gross margins (gross revenue minus direct costs) and do not include overhead and owner labor and management costs, which are required to calculate a true profit or return to business equity.

**Profitability** is the ability of the farm/ranch business or enterprise to generate accrual-adjusted income in excess of total accrual-adjusted expenses. Profit is the net income to equity capital (see definition of net farm/ranch accrual income).

**Rate of Return on Equity** measures the rate of return on equity capital employed in the farm business. The higher this value, the more profitable the business.

**Rate of Return on Assets** can also be called return on investment. This ratio gives an indication of how productively the assets are being utilized. A low return on assets could indicate inefficiencies in the use of assets, low net income due to crop failure, etc., or a combination of both.

**Returns to Management (Cost or Return)**. Backgrounding requires additional management, and in a full cost analysis, this should be recognized. Management cost or an equivalent living withdrawal is used to represent this cost. A suggested five percent of gross income, adjusted for the time backgrounded, is equivalent to a management salary.

**Sunk Cost** The costs incurred prior to weaning are **sunk costs** that cannot be changed and are not considered in the evaluation of retained ownership options. To evaluate the feasibility of preconditioning weaned calves, the net value of the calves, if sold at weaning, must be determined. What the weaned calf could be sold for is the unrealized value or “opportunity cost” for the preconditioning program. Simply put, it is the beginning cost of the calf for the preconditioning retained ownership analysis.

**Total Unrealized Sales Value** is the net sales revenue that is projected if the calves are sold at weaning after shrink and marketing costs. The weight price and marketing costs are critical.

## **Appendix B: Sell or Keep Decision Aids Examples**

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- Precondition - Sell or Keep
- Stocker Grazing – Sell or Keep Graze
  - Feedyard Finishing – Sell or Keep
  - Lease Grazing or Buy Cattle Analysis
- Purchase or Not Weaner Calves or Stocker/Feeder Analysis
- Closeout – Sell or Keep Weaned Calves, Stocker or Feeder Analysis
  - Custom Fed Closeout– Sell or Keep
  - Cull Cow – Sell or Keep Analysis
    - Head Day Calculator
  - Stocker Closeout Sell or Keep

## **Additional Retained Ownership Decision Aids**

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- Branded vs. Conventional Finishing
- Lot Closeout Alliance Evaluation

## References

<http://agecoext.tamu.edu/spa> for ordering software material.