GRAZING LANDS ECONOMICS: EVALUATING STOCKER GRAZING ALTERNATIVES

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ABSTRACT: Increased cost of feed grains, reflected in feedyard cattle cost of gain, availability of ethanol by-product feed, grass fed beef production and increased cattle price risk have brought a focus on utilizing grazing land for stocker cattle (young grazing calves with starting weights ranging from 300 to 550 pounds). This paper provides economic analysis tools to address decisions grazers must face related to stocker production and marketing. Stocker profitability, whether through retained ownership or purchased, is very dependent upon purchase cost (or net sales opportunity cost if owned), and cattle sales price. Initial cattle cost is by far the largest production cost. Stocker production and marketing is a margin business. This reality is reflected in four measures including: value of gain, cost of gain, marketing margin and grazing margin. The description of these measures provides information and definitions useful in budgeting or evaluating results of a stocker grazing system. Economic considerations in preparing stocker grazing lease arrangements to share price and production risk with cattle owners are summarized. Components of these measures and their calculations are presented to facilitate decision makers’ efforts to include these concepts into their grazing analysis spreadsheets. Productivity of stockers compared to cow-calf units illustrates why stockers are a competitive alternative to cow-calf grazing.

Keywords: stockers, grazing, margins, economics, decisions

Introduction

Stocker cattle are normally the most profitable way to utilize grazing lands when there is sufficient grazing quality. This paper explains financial and economic concepts that can be useful in evaluating stocker grazing alternatives. It should be noted the economic methodology to evaluate stocker cattle is the same whether a conventional production system or natural, grass fed, organic or niche market production system.

Stocker Cattle Economics

The profitability of stocker cattle, whether through retained ownership or purchased, is highly dependent upon purchase cost (or net sales opportunity cost if produced in the cow-calf operation) and cattle sales price. Initial cost of the cattle is by far the largest cost in production. Stocker production and marketing is a margin business. It is value added gain versus cost of gain or added cost.

This reality is reflected in four measures: value of gain, cost of gain, marketing margin and grazing margin. The description of these measures below provides information and definitions useful in budgeting or evaluating results. Components of these measures and their calculations are presented to facilitate decision makers’ efforts to include these concepts into grazing analysis.

Cow-calf producers are always challenged to consider retaining ownership of calves beyond weaning. They must choose between selling calves at weaning, or adding the cost, risk and time to carry them to another phase. The goal is to increase net revenue through retained ownership.

The cost of producing the weaned calf is a sunk cost; it cannot be reversed. The sunk cost to produce the calf is irrelevant in making the retained ownership decision. If net revenue can be added by retaining ownership, it will contribute to the total business net income or reduce losses from the cow-calf phase. The initial calf value for retaining ownership is the net price the producer could receive by selling at weaning. This initial value is the opportunity cost of not selling at weaning. Once the weaned calf value is established, the potential for retaining ownership can be estimated.

Value of Gain

The value of gain explains what can be paid for “weight gain” with the initial purchase cost, net sales payweight and price. With knowledge of the
full cost of production, one can quickly estimate the potential for profitability.

The following data is needed to calculate the value of gain:

1. Beginning payweight of weaned calves or stocker cattle
2. Payweight purchase cost of cattle, or opportunity cost of owned cattle
3. Net ending payweight when marketed
4. Payweight sales value of cattle
5. Net gain (ending payweight minus beginning payweight)

When this data is known, the value of gain measures can be calculated. The value of gain per head is calculated by multiplying sales payweight by net sales payweight price, then subtracting by the factor of purchase payweight and the purchase cost of cattle.

Formula:  \[(\text{Sales Payweight} \times \text{Net Sales Payweight Price}) - (\text{Purchase Payweight} \times \text{Purchase Cost of Cattle}) = \text{Value of Gain/Hd}\]

Then, divide value of gain per head by net gain to calculate the value of gain per pound measure.

Formula:  \[
\frac{\text{Value of Gain/Hd}}{\text{Net Gain/Hd}} = \text{Value of Gain/Lb}
\]

The value of gain which can be compared to the cost of grazing gain is illustrated in Table 1 below. The cost of grazing gain could be increased from $0.50 to $0.52 to achieve the target margin, but only if all other variables remain constant, which never occurs. Decision makers would most likely desire a greater difference between value of gain and cost, given the risk involved. This is the reason planning and risk management are required. When comparing this value to the cost of grazing gain, ensure the total unit cost is used. Including an expected target profit margin is a reminder the business needs to conduct profitable activities to be financially sustainable. Breakeven cost calculations frequently reported in the cattle sector is not a relevant choice criterion.
software program can greatly facilitate stocker cost accounting.

It is important for decision makers to learn to create their own cost structures, and not rely on published stocker cost of gain or breakeven costs, as they are always incomplete. Costs overlooked in published cost of gain information include depreciation, facilities’ operating costs, general and administrative costs, and returns to owner/operator labor and management or family living withdrawals.

Once the total cost of gain is calculated, divide by net payweight gain to calculate total unit cost.

Formula: \[ \text{Total Cost of Gain/Net Payweight Gain} = \text{Total Unit Cost} \]

**Marketing and Grazing Margins**

It has been established that stocker operations are margin businesses. As such, the grazing margin (when the value of weight gain is less than the cost of gain, or added value is greater than added cost) is most frequently offset by a negative marketing margin (the difference between feeder selling price and purchase price, referred to as the buy/sell margin, or rollback). This is why the purchase cost of lighter cattle is normally greater than sales price, as more opportunity for gain enables a larger grazing margin.

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

Grazing margin is the sales price, less the cost of gain, multiplied by 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 margin must offset the negative marketing margin for the enterprise to generate a positive net income. The marketing margin and grazing margin must produce a positive figure when added together in order to generate a profit for the operation.

The following data is required to calculate these margins for the evaluation of grazing alternatives:

1. Payweight of weaned calf or stocker cattle
2. Payweight purchase cost of cattle
3. Net payweight when marketed
4. Payweight gain
5. Total cost of gain (all costs including general, administrative and finance costs)
6. Payweight net sales price
7. Number of head out or sold, net of death loss

Formulas for calculating margins:

Marketing Margin ($/Hd) = (Total Purchase Payweight*0.01)(Sales Price - Purchase Cost)/Head Out

Grazing Margin ($/Hd) = (Sales Price - Cost of Gain)(Net Gain*0.01)/Head Out

All prices and costs are figured as $/cwt, weights are in pounds, and the unit for margins is dollars per head out. Payweight to payweight comparisons account for death loss, and should always be used, as the decision maker will only be paid for live cattle.

The sum of marketing margin and grazing margin is profit per head. That is, is the marginal revenue gained greater than marginal or added cost?

Formula: Net Income ($/Hd) = Marketing Margin + Grazing Margin

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 negative marketing margin can be offset by a positive grazing margin.

**Determining Maximum Stocker Purchase Price**

Decision makers need to make calculations before purchasing stocker cattle or making a decision regarding retained ownership. Total cost needs to be accurately estimated in these calculations, and the desired net margin should be included. It is not effective to produce and market at breakeven cost. One must plan for a break profit, or breakeven cost plus a desired margin when pricing stocker cattle.

The formula for determining what can be paid for stocker cattle is as follows:

Maximum Price ($/Cwt) = ((Sales Market Payweight*Market Payweight Price) - (Total Cost of Gain + Desired Margin)) / Beginning Payweight*100
Return on Operating Capital Investment

From a total business investment standpoint, the projection of return on investment is the most important measure of profitability. However, it is seldom addressed in analysis. A business will not be profitable, or build business equity, if the production activities are not profitable. To contribute to profitability, a good portion of the annualized ROI for stockers must be greater than capital cost. The formula includes the capital requirement equal to the cost of the stocker, plus one half of the cost of gain, adjusted for the days the cattle are grazed. It assumes production costs are evenly paid out across the production period.

Use the following formula to calculate projected ROI:

\[
ROI \% = \frac{(\text{Net Margin} + \text{Desired Return} + \text{Interest Charged})}{(\text{Beginning Payweight} \times \text{Purchase Cost} \times 0.01) + \text{Total Cost of Gain} \times 0.5 \times (\text{Days on Grazed} / 365)}
\]

Great care must be exercised in reading reports in the beef cattle sector labeled profit or loss. Most frequently in feedyard and other cattle financial reporting, these numbers are gross margins (gross revenue minus direct costs); not profit. Direct costs do not include general and administrative costs, owner labor and management costs or depreciation, which are required to calculate true profit or return to business equity. The only way for producers to attain true profit information is to generate their own through the business' income or profit and loss statement, which is accrual adjusted for change in inventories, receivables and prepaid expenses. The term “cash profit” is not a meaningful financial term. Using incomplete cost measures only distorts reality. The best measure of “profitability” is net return on investment (ROI).

Importance of Marketing

These basic stocker calculations illustrate the importance of marketing for successful stocker operations. The notion that you buy a profit or loss based on the initial purchase cost of the stocker is not an understatement. Successful stocker operators devote a great deal of time to marketing themselves or hiring this service. Risk management, utilizing the futures market and alternative contracting strategies, must be a component of effective stocker marketing.

Seasonality in stocker and feeder cattle prices is a large part of both the purchase and selling strategy of stocker cattle economics. Approximately seventy percent of calves are born in the spring and weaned in the fall. Simple supply and demand leads to lower fall prices and higher spring prices, for calves to graze the seasonally abundant forages.

It is a proven fact that producers must have special market access to receive the added revenues for an added investment in calves which warrant a higher price. Producers cannot expect the traditional auction market to generate this compensation. Access to special markets must be confirmed before engaging in special market retained ownership.

Price Slide and Shrink

The concept of a price slide is that adjustments in price need to be made to compensate for the fact that as the weight of stocker or feeder cattle increases, their market price decreases. This can be observed in historical prices and in the marketplace. The reason this takes place is as weight increases, the buyer has less weight to add to the animal before finishing, covering the higher cost initial purchased weight. This is the negative “marketing margin” reality explained above. Price slide is used by buyers to account for possibilities of error in projecting cattle weight. Slide terms are clearly specified in contracts. Sorting cattle to minimize the negative impact of slides is important. Some contracts specify an up slide that protects the buyer, but no down slide. The seller is best protected by both an up and down price slide if the weight is below the base.

Production and Price Risk, Sharing Risk

There are price and production risks in stocker grazing. Cattle production risks include health and death loss, poor cattle genetics and prior management practices which reduce performance. Rainfall and other climatic conditions affect grazing production, and help determine cattle stocking rate and rate of gain. The price risks the cattle owner accepts include pricing cattle correctly: buying right, and the final net sales price which determines the value of gain and marketing margin. There is market risk in timing both the purchase and sale of cattle. Although there are seasonal price highs and lows for stocker and feeder cattle, they cannot be accurately predicted, therefore there is uncertainty
associated with timing. Corn price is another source of feeder cattle price risk, as it is the most important feed grain. This was experienced in recent years with the growth of the ethanol industry. The lack of complete and timely cost data often limits budgeting and closeout evaluation, leading to uninformed decisions.

Grazing land owners can eliminate price risk by not owning cattle and leasing grazing. Production risk can be shared by setting rates per head, per month or per acre of land, rather than using net gain leases. By not owning the cattle, land owners do not participate in a favorable marketing margin. Death loss and weighing conditions can be detailed in the written lease.

In today’s volatile price environment, stocker cattle grazers should always be positioned to send cattle to a grow yard or feedyard if weather or other conditions limit grazing. The shorter optimal span available and more variable the weather conditions, the greater the production risk and need to have the backup grow yard in the plan.

Leasing arrangements for stockers are expressed in terms of cost of gain, monthly per head rates, per head based on initial weight, or simply cost per acre. The recommendation is to convert all leasing fees to lease cost of gain, irrespective of the basis for the payment rate. This cost of gain can then be compared to grow yards and feedyard costs of gain, as the competitor for gains produced by grazing lands.

By leasing grazing land, the land owner shifts the purchase and sales price risk to the cattle owner, and lessens expected returns on the land. In gain contracts, the land owner shares in the production risk which can be high, especially if there is rainfall and weather risk. Per acre leases or per head, per month shift both price and production risk to the cattle owner. Lease terms should detail beginning cattle weights, especially in monthly lease rates, as the beginning cattle weight affects stocking rate. Death loss sharing conditions need to be specified in the written lease agreement as well.

Weighing conditions should also be part of the written lease agreement. This detail is critical for gain net leases. In reality, weighing cattle on the ranch or close to the ranch provides the most accurate measure. There is no more important investment for a stocker operation than a certified scale.

The same concept as price slide can be used for adjusting per head lease rates to recognize heavier cattle reduce the number of cattle that can be run for a given grazing land capacity. A slide can be used to adjust the lease rate per month of grazing by weight. The second level of adjustment should be for grazing season differences if heavier weight cattle use a shorter grazing season. The calculation for adjustment is based on the gross revenue generated from a base weight animal.

Being informed of the effect of different price or lease slide effects on income can be useful in negotiating or establishing price or grazing lease contracts.

### Comparing Stocker Cattle to Cow-Calf

Stocker cattle are normally a more profitable use of high quality grazing because they have greater production efficiency on grazing land than cow-calf operations. A great deal more forage and supplemental feed is required per pound of gain for a breeding cow than a stocker. Tables 2 and 3 below reflect this reality. Stockers can produce comparable gains per animal unit, and do not have to be carried 365 days a year. In a 150 day grazing season, stockers with an average daily gain of 1.75 lbs will produce more gain (438) per AU than a cow-calf unit at 373 pounds per AU, with an 86% weaning percentage and 520 pounds produced per exposed female.

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Table 2. Production per Exposed Cow 365 Days

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Table 3. Production per AU for Cows (1.2 AU) 365 Days

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Conclusion

Stockers hold an advantage over cow-calf units, as stocking rates can be more closely matched to the grazing production cycle. Stockers require less capital investment and labor than cow-calf production. However, the importance of marketing and the marketing margin does place more emphasis on marketing skills for the stocker producer.

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College Station, TX  77845
12/13/2009
www.GLCI.org
4TH Annual National Conference On Grazing Lands