FARM Assistance Focus

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Economic Impact of Beef Cattle Best Management Practices: Conversion to Grass-Fed Beef

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Grass-fed beef offers a more open and flexible production regimen and may be a viable management practice for some producers to improve business performance and profitability.

Commercial cow-calf producers in Texas have traditionally had three marketing options: livestock commission companies (auction barns), private treaty sales, or retained ownership (stockers/feeders). Some bull or heifer calves are sold for herd replacements but most are placed on wheat or other forage pasture for conditioning prior to going to the feedlot to be finished. While producers may or may not retain ownership, conditioning and feedlot enterprises are considered value-added segments in the cattle industry. Grass-fed, natural, and organic beef have emerged in recent years as potential value-added production and niche marketing options for individual producers. Natural and organic beef require adherence to strict production guidelines. Grass-fed beef offers a more open and flexible production regimen and may be a viable management practice for some producers to improve business performance and profitability.

Conversion to a non-traditional grass-fed beef operation may require operational adjustments such as reducing cow numbers and, possibly, forage improvement unless additional land resources are obtained (bought or leased). Cow numbers may need to be reduced to accommodate grazing weaned calves for an extended period and to higher weights if no additional land is acquired. Forage availability may also need to be enhanced with improved pasture and/or annual crops to ensure adequate grazing. By using artificial insemination (AI), herd bulls can be eliminated allowing for more cows to be maintained as well as improving genetics and meat quality. It has been estimated that up to two additional cows can be grazed for each bull eliminated.

The availability of production and marketing information regarding the conversion and establishment of a grass-fed beef operation is somewhat limited. This study analyzes the financial implications of converting a traditional cow-calf herd to a grass-fed beef operation to optimize profitability and financial performance in a specific scenario. Major changes to forage and the options of natural and organic beef production were not considered in this study.

While grass-fed beef production is not technically a recommended "Best management practice," this analysis fits in with a set of FARM Assistance Focus Series articles evaluating the financial impact of "best management practices" or other strategies to improve herd performance and ranching profitability. These may include changes to stocking rate, good herd health management and handling, culling open or low performing cows, pregnancy testing of cows, bull soundness testing (BSE), supplemental feeding, artificial insemination (AI), and value-added production and marketing. These and similar articles may be found at http://farmassistance.tamu.edu/publications/focus/index.php.

Assumptions

The Financial And Risk Management (FARM) Assistance

Table 1: 2012 General Assumptions for 200-Cow Traditional & 120-Cow Grass-Fed Operations

Selected Parameter	Cow-Calf	Grass-Fed
Operator Off-Farm Income	$24,000/year	2012-13 Off Farm Income; 2014-21 N/A
Spouse Off-Farm Income	$35,000/year	
Family Living Expense	$30,000/year	
Ownership Tenure	100%	
Ranch Size	2,000 acres	
Royalty Income	Not Included	
Hunting Income	$10/acre in 2012	
Part-Time Labor	$2,400/year	$4,920/year
Herbicide Costs/Acre	$1.50	
Herd Size	200	120
Number of Bulls	8	N/A
Cow Herd Replacement	Open Cows	
Vet, Medicine & Supplies	$15/cow	$20/cow
Salt/Mineral Blocks/Year	$26/cow	$43/cow
Hay Fed/Cow/Year	1.0 tons in 2012	
Protein Fed/Cow/Year	200 lbs. in 2012	
Cow Culling Rate/Year	10.0%	
Calving Rate	85%	90%
Bull/Steer Weaning Weights	550 lbs.	
Heifer Weaning Weights	525 lbs.	
Grass-Fed Market Target Weight	N/A	1,000 lbs.
Steer Prices	$1.60/lb. in 2012	
Heifer Prices	$1.50/lb. in 2012	
Cull Cow Prices	$0.90/lb. in 2012	
Cull Bull Prices	$1.10/lb. in 2012	
Open Cow Prices	$1,250/head	
Replacement Bull Prices	$2,500/head	N/A
Grass-Fed Market Target Price	N/A	$3.00/lb. in 2012
Hay Prices	$120/ton	
Cotton Seed Hull Prices	$0.15/lb.	
Pregnancy Testing	$6.50/cow	$7.00/cow
BSE Testing	$57.63/bull	N/A
AI Blood test	N/A	$2.50/cow
AI Synchronized Shot	N/A	$16.50/cow
AI Semen & Shipping	N/A	$16.46/cow
AI Labor	N/A	$12/cow
Liquid Nitrogen/Year	N/A	$1.67/cow
Semen Tank	N/A	$600
AI Equipment	N/A	$200

Table 2. Projected Annual Financial Indicators (2012-2021)

Scenario	10-Year Averages				Cumulative 10-Yr Cash Flow ($1,000)
	Total Cash Receipts ($1,000)	Total Cash Costs ($1,000)	Net Cash Farm Income ($1,000)	Net Cash Farm Income/Cow ($1,000)	
Cow-Calf	182.22	109.83	72.38	0.362	749.49
Grass-Fed Beef	249.74	98.46	151.28	1.261	1,027.94

strategic planning model was used to illustrate the financial impacts of converting a cow-calf operation to grass-fed beef. Two scenarios were evaluated: 1) maintaining the standard cow-calf operation and 2) conversion to a grass-fed beef operation.

The 2,000-acre ranch in this model consists of 1,800 acres of native pasture and 200 acres of established Coastal Bermuda used for grazing only. The initial cow herd in 2012 includes 200 cows (1 animal unit to 10-acre stocking rate) and 8 bulls (1 bull to 25 cows). The general assumptions are given in Table 1. Production inputs, yields, cost, and estimates for overhead charges were based on typical rates for the region. In 2012, the income from hunting was $10/acre. The assets, debts, machinery inventory, and scheduled equipment replacements for the projection period were the same in both management scenarios. It is assumed the ranch has only intermediate term debt. Cattle prices used were from the Live Oak Livestock Commission Company auction report in Three Rivers, Texas, for July 10, 2012.

Specific assumptions were made in both management scenarios (Table 1). A traditional cow-calf operation was assumed to pregnancy test cows as well as perform bull soundness testing and has an 85% calving rate. Weight gain and death loss assumptions in the scenarios were based on research conducted by Texas A&M AgriLife Research and Extension Service.

The grass-fed scenario assumes that conversion occurs in 2012 and cow numbers are reduced 40% to 120 head as calves are weaned and all bulls are sold. The 40% reduction in cow numbers was an estimate to compensate for additional forage required to graze calves to a larger weight in a grass-fed operation and maintain an equivalent 1:10 stocking rate. In 2012, calves in the traditional cow-calf operation are born Mar-May and 168 head are sold 7 months later in November-December.

For the grass-fed conversion scenario, AI is initiated in May 2012 with estrus synchronization. Ten cows per month are synchronized and bred by AI each year to ensure producing a steady monthly supply of calves year round. The first AI calves are born in February 2013 and weaned in September.

It is assumed that only 6-7 cows are bred in the first AI attempt in May 2012 requiring the remaining 3-4 to be re-synchronized and rebred again. As the operator's AI skills improve, 9 cows are bred per month producing a 90% calving rate. The total number of cows bred in 2012 is 51, 99 in 2013 and 108 in 2014. Open cows (1/month or 12/year) are culled after two synchronization attempts.

Estimated annual reoccurring AI related costs are: blood test $2.50/cow; synchronization $16.50/cow (product); insemination $16.46/cow ($10.97/straw with shipping x 1.5 times/cow assuming 50% have to be rebred); labor $12.00/cow; and liquid nitrogen (to maintain semen storage tank) $200 per year ($1.67/cow). The average AI cost is $49.13/cow/year for a total cost of $2,948 for 60 cows in 2012 and $5,896 for 120 cows in 2013 and thereafter. Additionally, in 2012, the producer would have a one-time cost of $600 for purchasing a semen tank and $200 for AI equipment.

The average weaning weight for calves is 525 lbs. (heifers 500 lbs. and bull calves 550 lbs). Calves are grazed for approximately 300 days to 1,000 lbs, assuming a 1.5 lb/day average weight gain. Annual supplemental hay and protein feed requirements were increased in 2013 and again thru 2014-2021 to compensate for the additional grass-fed animals. Assuming a 2% death loss (1% at birth and 1% pre-sales), the number of grass-fed calves marketed is 0 head in 2013, 51 head in 2014, and 106 head annually in 2015-2021.

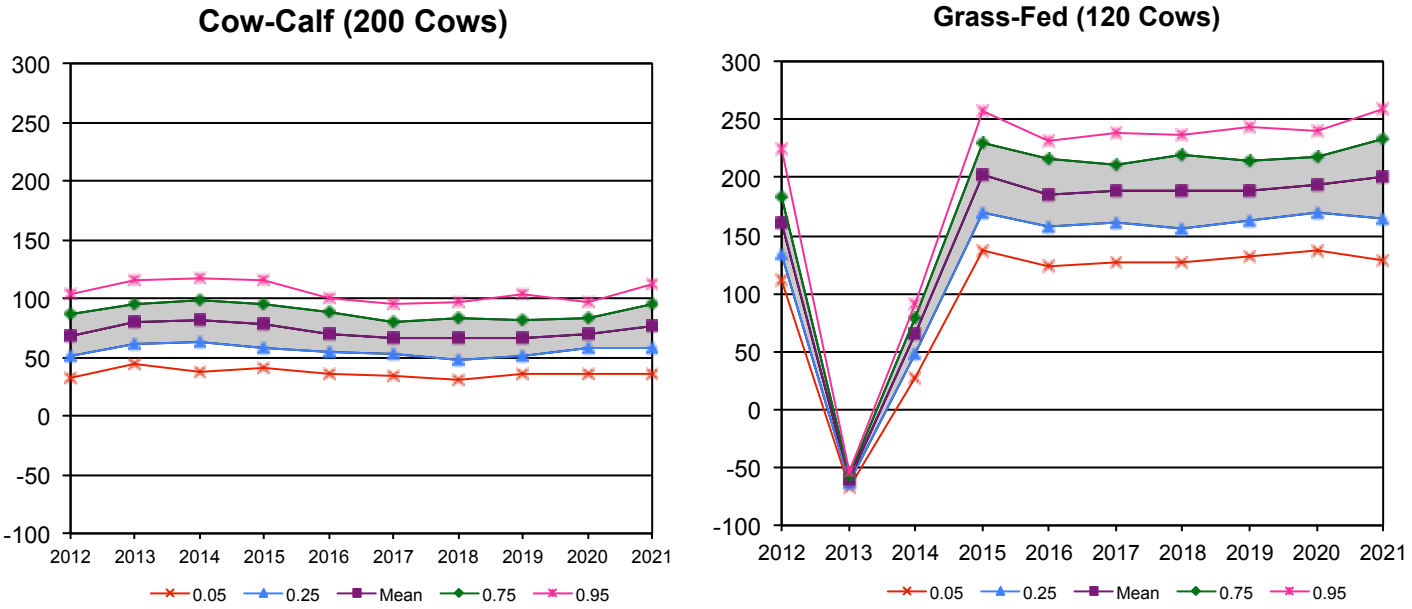
While a 1,000-lb sale weight and $3.00/lb market price for grass-fed cattle are target levels, these levels may or may not be obtained year-in and year-out due to the risk of drought conditions and low-performing calves. If forage conditions deteriorate in a given grazing cycle, calves may have to be sold at lighter weights. Average market weight over a 10-year period was adjusted 10% down to 900 lbs to reflect the "forage" risk. Also, calves that do not make the quality grade or size requirements likely will be sold at discount. Average prices were adjusted down to $2.75/lb.

The base year for the 10-year analysis of the representative ranch is 2012 and projections are carried through 2021. Commodity and livestock price trends follow projections provided by the Food and Agricultural Policy Research Institute (FAPRI, University of Missouri) with costs adjusted for inflation over the planning horizon.

Representative measures, including profitability and liquidity were chosen to assess the financial implications of each scenario. Profitability measures the

Value-added grass-fed marketing will require a significant level of market development and management to achieve the price and sales assumptions in this scenario.

Figure 1. Projected Variability in Net Cash Farm Income for Traditional Cow-Calf & Grass-Fed Beef Production



extent to which a farm or ranch generates income from the use of its resources. Net cash farm income (NCFI) is one measure of profitability. Liquidity measures the ability of a farm or ranch to meet its short-term financial obligations without disrupting the normal operations of the business. The liquidity of the operation may be measured by the ending cash balance which is net of taxes. Each measure provides information with respect to the projected variability in the ranch's financial position and performance. When taken as a whole, the analysis provides insight into the risk and return expectations of the ranch throughout the planning horizon under each management practice.

Results

Comprehensive financial projections, including price and weaning weight risks, are illustrated in Table 2 and Figure 1. Table 2 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the range of possibilities for the selected variable. Conversion to grass-fed beef production may offer the potential to significantly increase profitability of an operation (Table 2 and Figure 1). In a traditional cow-calf operation (Scenario 1), the average net cash farm income (NFCI) is $72,380/year or $362/cow/year. The operation begins the first year (both scenarios) with a cash balance of $10,000, and if profitable, accumulates cash over the 10-year period. Average cash reserves, at the end of the 10-year projections for the cow-calf scenario is $749,490. It is worth noting that off-farm income and hunting contributes somewhat to the cash flow of the ranching business; however, this effect is present in both scenarios.

Grass-fed (Scenario 2) may offer a significantly greater potential for improving profitability and financial performance of a cattle operation (Table 2). Under these assumptions, NCFI averages $151,280/year over the 10-year projection, 109.0% more than the cow-calf scenario. The 10-year average NCFI per cow are $1,261/cow, an increase of $899/cow. Average cash reserves at the end of the 10-year period increase $1,027,940, 37.2% more than the cow-calf scenario. If additional expenses are required to maintain or improve the forage base or to support marketing efforts, the capital would be available from these reserves.

Implications

The financial performance and condition of a typical cow-calf operation is normally supported by off-farm income, hunting, and other sources of income. Grass-fed beef production using AI may be a viable option for value-added production to improve profitability. Actual results will likely vary by producer, herd genetics, forage conditions, management practices, and cattle markets, but this example is provided to show the bottom-line impacts for a reasonable set of assumptions. Moreover, value-added grass-fed marketing will require a significant level of market development and management to achieve the price and sales assumptions in this scenario. A judicious manager will evaluate and implement the best operational strategies that can reasonably be adopted in order to benefit the overall financial performance of the ranch.

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