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Economic Impact of Beef Cattle Best Management Practices in South Texas: Calf Management

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Best management practices” are strategies to improve herd performance and ranching profitability.

Cow-calf producers in South Texas routinely make management decisions to adapt to weather, market and economic conditions that impact their bottom-line. Internal parasites and disease are also issues that affect performance and profits. Successful managers find ways to improve performance and profitability through adopting better and cost-effective approaches to doing things.

“Best management practices” are strategies to improve herd performance and ranching profitability. These may include changes to stocking rate, culling open or low performing cows, pregnancy testing, bull soundness examination (BSE), supplemental feeding, and calf management practices such as clostridial vaccinations, castration, using growth implants, and deworming.

Increased calf management can improve herd performance and weaning weights. In 2009, Animal and Plant Health Inspection Service (APHIS) reported that vaccinations are an integral tool for preventing disease and death loss, but only 57.7% of the calves (from 22 days of age to weaning) in the United States received clostridial vaccinations (blackleg). A study by McCollum (1998) concludes that the use of growth-promoting implants in suckling calves increased the average daily weight gain by 0.1 lb/day in steers and by 0.12 lb/day in heifers. A Cal State Poly report by Becket (2003) found that light-weight stocker cattle (324 lb average starting weight) gained 31.7 lbs more on average than cattle not dewormed. This study illustrates a case study example of the financial implications of the use of the selected calf management practices to optimize the profitability of South Texas ranching operations.

Assumptions

The Financial And Risk Management (FARM) Assistance strategic planning model was used to illustrate the individual financial impacts of using calf management practices by South Texas ranchers.

Five scenarios were evaluated:

1. Not using clostridial vaccinations, implants, castration, growth implants or deworming (no calf management);
2. Administering clostridial vaccinations to all calves;
3. Castrating bull calves and implanting all calves;
4. Deworming all cattle and calves; and
5. Using all selected management practices (clostridial vaccinations, castrating and implanting, and deworming).

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 cow herd 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 2010, the income from hunting was \$7/acre. The assets, debts, machinery inventory, and scheduled equipment replacements for the projection period were the same in all 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 May 30, 2010. In Scenarios 3, 4 and 5, a market price slide of \$.02 for each 25 lbs of weight gain was assumed to reflect market changes.

Specific assumptions were made in each scenario. A typical ranch was assumed to pregnancy test cows and BSE test bulls and has an 85% calving rate. Weight gain and death loss assumptions in the scenarios were based on research conducted by Texas AgriLife Research and Extension Service.

The first scenario assumes that the ranch does not use blackleg vaccinations, castration, implants nor deworm calves. Due to no calf management, a 6% death loss is assumed.

Table1: 2010 General Assumptions, South Texas Representative Ranch

Selected Parameter	Assumptions
Operator Off-Farm Income	\$24,000/year
Spouse Off-Farm Income	\$35,000/year
Family Living Expenses	\$30,000/year
Native Pasture	1,800 acres
Improved Pasture (Bermuda)	200 acres
Ownership Tenure	100%
Royalty Income	Not Included
Hunting Income	\$7/acre
Herbicide/Acre (Bermuda only)	\$7.50
Fertilizer/Acre (Bermuda only)	\$13.00
Herd Size	200 Cows, 8 Bulls
Cow Herd Replacement	Bred cows
Vet, Medicine & Supplies	\$25/cow
Salt/Mineral blocks/Year	\$30/cow
Hay Fed /Cow/Year	1.5 tons
Protein Cubes Fed/Cow/Year	150 lbs.
Calving Rate	85%
Cow Culling Rate/Year	7.50%
Steer Weaning Weights	525 lbs.
Heifer Weaning Weights	475 lbs.
Steer Prices	\$1.12/lb.
Heifer Prices	\$1.05/lb.
Cull Cow Prices	\$.54/lb
Cull Bull Prices	\$.62/lb.
Bred Cow Prices	\$1,100/head
Replacement Bull Prices	\$2,300/head
Hay Prices	\$100/ton
Range Cube Prices	\$.15/lb.
Pregnancy Testing	\$6.50/cow
Bull Testing	\$57.63/bull
Clostridial Vaccination	\$.84/calf
Growth Implants	\$1.74/calf
Deworming Pour-On	\$3.39/cow
Extra Day Labor/Practice	\$1/calf

All calf management practices evaluated offer the potential to significantly increase profitability of an operation.

In Scenario 2, a clostridial vaccination is given to calves and boosted once in a season. The two vaccinations cost \$0.84/calf or \$144/year for all calves. Calf prices and weights were assumed to be the same as Scenario 1. A 1% death loss is assumed because of the use of the 7-way vaccination which prevents calf death loss due to the disease. A \$2/calf charge or \$340/year for all calves was added for extra day labor.

The third scenario involves castrating all bull calves and implanting all calves with growth promoting implants. The cost of the implants was estimated to be \$1.74/calf. The cost of castrating and implanting was \$2.11/calf. Research by McCullum (1998) reflects implants would increase weight gain by 5% (steers weighed 550 lbs and heifers 500 lbs at weaning as a result of the practice). The heavier weight cattle would result in a \$0.02/cwt market price slide for each 25 lbs of weight gain for calves. A \$1.50/calf charge or \$255/year for extra day labor was added to work calves.

Scenario 4 uses a pour-on application for deworming and horn fly protection for the entire cattle herd. The cows and bulls are dewormed 2 times a year and the calves once. The estimated cost of deworming all cattle and calves was \$3.39/cow/year. A charge of \$0.85/cow or \$170/year labor was added for the second round of deworming the cattle. Based on a study by Becket (2003), a 5% weight gain for calves was assumed (steers weighed 550 lbs and heifers 500 lbs at weaning). A \$.02/cwt. market price slide was also assumed for each 25 lbs of weight gain on calves at sale.

Scenario 5 is the use of all selected calf management practices (clostridial vaccinations, castration and implants, and deworming). It was assumed that average calf weights would increase 10% (steers 525 to 575 lbs and heifers 475 to 525 lbs). The extra labor charge for the combined three practices was \$4.68/cow or \$935 total per year. The \$.02/cwt price slide for each 25-lb weight gain was also applicable.

The base year for the 10-year analysis of the representative ranch is 2010 and projections are carried through 2019. 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 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.

All calf management practices evaluated offer the potential to significantly increase profitability of an operation (Table 2 and Figure 1). With no selected calf management practices (Scenario 1), the average net cash farm income (NCFI) is \$8,480/year or \$42/cow/year and \$50/calf/year. The operation begins the first year of each scenario 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 Scenario 1 is \$1,517/cow and \$1,785/calf. 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 all scenarios.

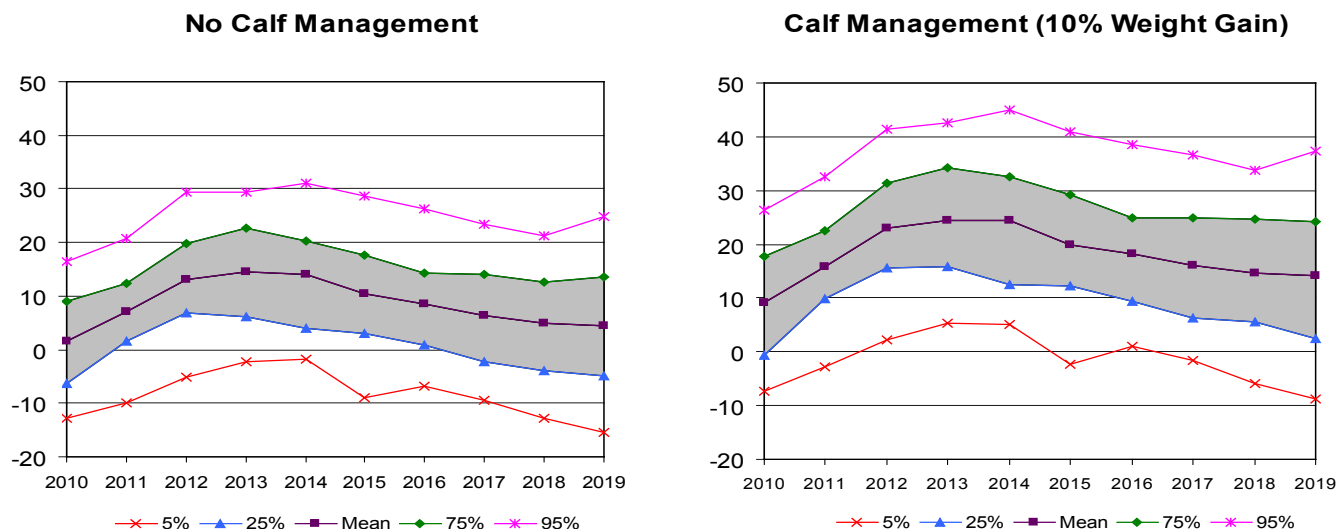
Clostridial vaccinations (Scenario 2) presents the greatest potential for significantly improving profitability and financial performance of a cow-calf operation (Table 2), assuming the death loss reduction from 6% to 1% is achieved. NCFI averages \$13,880/year over the 10-year projection, 63.7% more than the no vaccination scenario. The returns per cow are \$69/cow, \$27/cow more than the no vaccination scenario. Returns per calf were \$82/calf, an increase of \$32/calf solely due to a reduction in death loss. Average cash reserves

Table 2: 10-Year Average Financial Indicators for a South Texas Representative Ranch (200 Cows)

Scenario	10-Year Averages					10-Yr	10-Yr
	Total Cash Receipts (\$1000)	Total Cash Costs (\$1000)	Net Cash Farm Income (\$1000)	Net Cash Farm Income/Cow (\$1000)	Net Cash Farm Income/Calf (\$1000)	Ending Cash Balance/Cow (\$1000)	Ending Cash Balance/Calf (\$1000)
1-No Calf Management	129.60	121.12	8.48	0.042	0.050	1.517	1.785
2-Clostridial Vaccinations	135.49	121.60	13.88	0.069	0.082	1.705	2.005
3-Castration & Implants	132.98	121.80	11.18	0.056	0.066	1.610	1.894
4-Deworming	132.99	122.82	10.17	0.051	0.060	1.575	1.853
5-All Calf Management	141.98	124.01	17.97	0.090	0.106	1.843	2.168

Implementing cost-effective calf management practices such as blackleg vaccinations, castrations and implants, and deworming may offer cow-calf producers the potential to improve profitability.

Figure 1: Projected Variability in Net Cash Farm Income for No Calf Management vs. Calf Management and 10% Weight Gain



at the end of the 10-year period increase \$188/cow and \$220/calf on average.

Castration and growth implants (Scenario 3) also increased profitability based on the case study assumptions (Table 2). NCFI averaged \$11,180/year, 31.8% more than Scenario 1. This amounts to a \$14/cow and \$16/calf increase over doing nothing (Scenario 1). Average ending cash reserves improve by \$93/cow and \$109/calf. A \$.02/cwt. market price slide was assumed due to heavier calves (average 25 lbs heavier) reduces the potential gains in income and cash reserves.

Deworming (Scenario 4) also offers gains to the bottom-line of a cow-calf operation. NCFI averages \$10,170, 19.9 % more than Scenario 1 (Table 2). This is a net increase of \$9/cow and \$10/calf over Scenario 1. Ending cash reserves increased by \$58/cow and \$68/calf. Gains in NCFI and cash reserves are again tempered by the \$.02/cwt market price slide.

All calf management (Scenario 5) combines the benefits of clostridial vaccinations, castration

and implants, and deworming. NCFI averages \$17,970, and represents \$90/cow and \$106/calf per year (Table 2 and Figure 1). This reflects a 111.9% or \$9,490 (\$47/cow and \$56/calf) increase over Scenario 1 with no calf management practices. Ending cash reserves increase by 21.5%.

Implications

The financial performance and condition of a typical South Texas cow-calf operation is normally supported by off-farm income, hunting, and other sources of income. However, implementing cost-effective calf management practices such as blackleg vaccinations, castrations and implants, and deworming may offer cow-calf producers the potential to improve profitability. Actual results will likely vary by producer, management practices, and cattle markets, but this example is provided to show the bottom-line impacts for a reasonable set of assumptions. Moreover, the actual "slide" in calf prices due to extra weight gain of 5% to 10% may vary according to existing market

conditions and will directly impact overall profitability. A judicious manager will evaluate and implement the best operational strategies that benefit the overall financial performance of the ranch and minimize overall risk.

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