Profitability of Beef Cattle Best Management Practices in South Texas: Conversion from Bred Cows to Heifers for Replacements

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Table 1: 2019 General Assumptions, South Texas Representative Ranch					
Selected Parameter	Assumptions				
Operator Off-Farm Income	\$50,000/year				
Spouse Off-Farm Income	\$35,000/year				
Family Living Expense	\$50,000/year				
Native Pasture	1,800 acres				
Improved Pasture (Bermuda)	200 acres				
Ownership Tenure	100%				
Royalty Income	Not Included				
Hunting Income	\$10/acre				
Herbicide/Acre (Native Pasture)	\$0.90				
Herbicide/Acre (Bermuda)	\$12.00				
Fertilizer/Acre (Bermuda only)	\$30.00				
Number of Cows	200				
Number of Bulls	8				
Cow Herd Replacement	Young bred cows				
Vet, Medicine & Supplies	\$34.34/cow				
Salt/Mineral blocks/Year	\$23.60/cow				
Hay Fed/Cow/Year	1.5 tons				
Protein Cubes Fed/Cow/Year	200 lbs.				
Cow Culling Rate/Year	10%				
Steer Prices	\$1.50/lb.				
Heifer Prices	\$1.40/lb.				
Cull Cow Price	\$.64/lb.				
Cull Bull Price	\$.80/lb.				
Bred Cow Price	\$1,200/head				
Bred Heifer Price	\$1,000/head				
Open Heifer Price	\$800/head				
Replacement Bull Prices/Head	\$3,000				
Hay Price	\$100/ton				
Bulk Range Cube Price	\$.15/lb.				
Pregnancy Testing	\$7.50/cow				
BSE Testing	\$42.50/bull				
Clostridial Vaccination	\$1.16/calf				
Castration & Growth Implants	\$1.97/calf				
Deworming Injection (Calf/Cow)	\$1.81/\$3.96				
Reproductive Vaccines	\$3.12/cow				
Extra Day Labor/Calf Practice	\$2/calf				



Abstract

Deciding where and how to find replacement females is one of the most important and risk laden business decisions ranchers make. Many producers raise replacement females without considering the cost of doing so in terms of reduced number of calves produced, increased time and management involved, and reduced profitability initially.

Introduction

Based on Gill et al (1994), cow-calf producers have many options when increasing herds or replacing cows culled. The method used may be influenced by market prices, availability of quality replacements, and the desire to improve or change the genetics of the herd. Cows normally do not require additional development costs, but heifers do, and bred females (cows and calves) provide a quicker return on investment. Successful managers will select and/or retain high quality replacements with good genetics to improve overall herd performance and profitability.

"Best management practices," such as selection or retention of high-quality female replacements are proven methods for improving overall herd performance and ranching profitability. This study illustrates the financial implications of changing female replacement strategies from young bred cows to either purchasing bred heifers, open heifers, or raising owned heifers on herd performance and profitability of commercial South Texas ranching operations.



Assumptions

The Financial and Risk Management Assistance model was used to illustrate the financial impacts of herd replacement strategies. Four scenarios were evaluated: 1) young bred cows; 2) bred heifers; 3) buying open heifers; and 4) raising replacement heifers.

A 2,000-acre ranch consisting of 1,800 acres of native pasture and 200 acres of Coastal Bermuda was used in the analysis. Under normal stocking, the cow herd includes 200 cows (1 animal unit per 10-acre stocking rate) and 8 bulls (1 bull to 25 cows). The operation normally replaces females with young bred cows and carrying capacity is limited to 200 animal units, including cows and any replacement heifers. The operation calves in the spring and pregnancy checks and cull cows in the fall.

Production inputs, costs, and overhead charges were based on typical rates for the region. 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.

Table 2: 2019-2028 Specific Assumptions, **South Texas Representative Ranch Assumptions Per Year** Replacement Selected 2019 Parameter **Scenarios** 2020 2021 2022-28 Bred Cows 90% 90% 88% Bred Heifers Calving Rate Buy Open Heifers 88% 90% Raise Heifers 90% 88% Bred Cows 525 Bull Calves 518 Bred Heifers 525 520 Weaning Weights Buy Open Heifers 520 525 518 525 (lbs.) 525 525 520 518 **Raise Heifers** Bred Cows 475 Heifer Calves Bred Heifers 475 470 468 Weaning Weights Buy Open Heifers 475 475 470 468 (lbs.) Raise Heifers 475 475 470 468 Bred Cows \$0 \$730 Bred Heifers Development Costs

Results

The methodology involved a 10-year financial simulation of returns by replacement practice using stochastic cattle prices and weaning weights. The scenarios compare the financial performance of replacement practices.

Implications and Considerations

Changing female replacement strategy from bred cows to raising or purchasing open or bred heifers will impact overall herd performance and bottom-line profits. Heifer development costs, lower calving and weaning rates, and reduced weaning weights may be limiting factors. Bull rotation or management will also be critical in heifer replacement scenarios. All four replacement strategies (young bred cows, bred heifers, open heifers, and raising open heifers) offer the opportunity to improve herd genetics. Cost of replacements, availability, and quality of replacements will be key issues affecting purchase decisions and maintaining a set strategy over time. Labor, time management, and producer preference in replacing females could also impact buying decisions.

It should be noted that the best option may not be the least expensive upfront. A combination of options is often the best and may change from year to year.

Calving rates, weaning weights, and death loss assumptions were expected to vary for cows and heifers based on research conducted by Texas A&M AgriLife Research and Extension. Calving rates average 90% for cows and 80% for firsttime heifers. The "blended" calving rate is 88% (heifers account for 20% of females calving) in the three heifer scenarios. Weaning weights are based on an annual mix of cows and heifers assuming first-time heifers normally have lighter weights calves. First calf heifer weaning weights were reduced 50 lbs. and second calf weaning weights by 25 lbs. per calf. Bred heifers were assumed to require 12 months of development costs, purchased open heifers 18 months, and raised heifers 25 months due to age when purchased.

The base year for the 10-year analysis is 2019 and projections are carried through 2028. Initial cattle prices were from the Live Oak Livestock Commission Company in Three Rivers, Texas, for February 25, 2019. Price trends follow projections by the Food and Agricultural Policy Research Institute (FAPRI, University of Missouri) with costs adjusted for inflation.

6	Buy Open Heifers	\$730	\$1,090		
	Raise Heifers	\$730	\$1,460	\$1,520	

Table 3: Net Cash Farm Income for a SouthTexas Representative Ranch, 200-Cow Unit

		10-Year Averages Per Year				
Scenario		Total Cash Receipts (\$1000)	Total Cash Costs (\$1000)	Net Cash Farm Income (\$1000)	Net Cash Farm Income Cow-Unit (\$1000)	
	Bred Cows	190.05	155.26	34.78	0.17390	
	Buy Bred Heifers	184.32	152.13	32.19	0.16095	
	Buy Open Heifers	172.13	140.11	32.02	0.16010	
	Raise Heifers	156.39	123.68	32.71	0.16355	

3

Carrying capacity or forage availability may also be a factor in maintaining a heifer replacement herd. If grazing capacity is limited to a set number of cow units and acquiring additional land is not possible, maintaining a heifer replacement herd may not be a viable option. Additionally, off-farm income, hunting, and other income sources will continue to help sustain cattle operations and impact replacement decisions.

Actual results will vary by producer, replacement options, production region, and cattle markets. Cow-calf producers should implement best replacement selection and other management practices that improve the bottom-line and financial performance of their operation.

References

Gill, R., S. Bevers, and W. Pinchak (1994). Evaluating Replacement Female Alternatives. Cattleman's Magazine. December 1994, Vol. 81, No. 7, Pages 10-16.