

Improving Profitability in East Texas Beef Herds: Practitioner's Perspective

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Abstract

Texas Beef Partnership in Extension Program utilized a team approach to recommend sound production and financial practices to improve the profitability of an East Texas beef ranch. The team gathered production and financial information annually, evaluated this data in a standardized information system, set production and financial goals, and developed plans to attain these goals. This systematic process identified management practices that lead to improving profitability in beef herds.

The ranch was evaluated over a three year period. The team consisted of a local producer, local extension agent, a local veterinarian, university extension and veterinary specialists. The team used the Standardized Performance Analysis (SPA) process to evaluate the ranch's production and financial information. The ranch's production performance improved over the three year period from 450lbs in FY1999 to 513lbs in FY2001 based on pounds weaned per exposed female. The total operational cost, non-calf revenue adjusted per cwt decreased from \$118.37 in FY1999 to \$76.26 in FY2001. The financial performance improved from a loss of \$205.49 per cow in FY1999 to a gain of \$74.40 per cow in FY2001. The producer's return on assets at market value improved from -17.35% in FY1999 to 9.28% in FY2001. The team approach that allowed the local participants to take advantage of the identified management practices and apply these practices to the production system was essential for the success of this process. The recommendations that led to these successes were founded on the principles of SPA.

Introduction

Animal scientists and veterinarians have recommended numerous management techniques and production practices that have been recognized and accepted as production solutions, without outcome based economics being considered.¹¹ The basis for the Texas Beef Partnership in Extension Program, Texas Beef PEP, is that all management recommendations should be evaluated on sound production and economic principles and should lead the ranch towards agricultural sustainability and

profitability. Profitability is one of the most misused words in the cow-calf sector of agriculture. Profit is defined as a net return to ranch equity.⁴ Increases in ranch equity occur by retaining net earnings. Most commercial producers are not profit-oriented and the majority do not generate a profit.⁴ Low profitability is a chronic problem for the commercial producer with an average return on assets at market value of 2.62%. This is the reason many commercial beef ranches are heavily subsidized by "off-the-ranch" income.⁴ The reason most commercial producers are not profitable is multi-factorial, but it is embedded in the fact that they do not take a business approach to ranching. Many producers are not readily innovative and do not adopt new technologies because of the economic risk.¹¹ Producers are slow to adopt even proven management techniques like breeding soundness evaluations for bulls, cattle palpation and calf growth promotant implantation.⁵ Well managed, highly profitable beef cattle ranches recognize the importance of having a business-minded approach, the essential role of production and financial analysis, and adaptation of innovative management and production methods.⁹ The focus of this paper is from a practitioner's viewpoint. It was written to explain the management techniques that were adopted to increase profitability of a commercial cow-calf herd.

The Texas Beef PEP program used a team approach to establish specific expected performance, annually measured the performance and compared it to a known standard, and formulated and developed a plan to attain the set standard. The team concept was developed on a two tier advisory phase. The first advisor tier involved local participants: a local veterinarian and a county extension agent. The second advisory tier involved university specialists: veterinarians, economists, nutritionists and animal scientists. There were at least six annual consultation visits to the ranch from the management team. The ranch consultation meetings were accomplished at different times of the year, by different personal, with herd health, nutrition, routine herd work, financial and production data assembly being the basis for different meetings. There was one annual meeting, with a holistic approach theme, where all participants reviewed production and financial data for this commercial herd.

A standardized information system, Standardized Performance Analysis (SPA), was utilized to collect data and to perform production and financial analysis. This process integrates the production and financial information and generates performance measures and reports for decision-making, which was very important in the Texas Beef PEP process. SPA is an analytical tool, providing performance and cost reference standards for the ranch. The ranch's financial and production data was submitted to a national database. The ranch production and financial information can then be compared and evaluated with other herds in the database for that fiscal year. The Standardized Performance Analysis process was accomplished annually in the three project years, 1999, 2000 and 2001.

The amassing of herd history, information and records began in the fall of 1999. The four areas of interest were ranch resources, management of those resources, production and economic outcomes.

Ranch Resources

The ranch resources included land, capital, labor and livestock. The ranch consisted of 732 acres. Approximately 632 acres were unimproved native pasture and 100 acres were an improved coastal Bermuda hay meadow. There were 100 acres of improved perennial pasture planted on the unimproved native acreage in the early fall. The terrain was slightly rolling with a Post Oak fauna. Eighty percent of the ranch had been cleared with twenty percent sparsely wooded. The water supply for the cattle operation was 95% pond or creek and 5% automatic waterers. The average rainfall for this region is 41 inches annually, with the 1999 rainfall amount of 25 in.

The capital resources for this ranch were from three different sources. The majority of the ranch capital was secured through a bank loan of \$30,000. The loan will be paid from the selling of calves in the early fall and selling of cull cattle in the late fall or early winter. Net monies from the cattle sales were maintained on the ranch. The third capital source was from "off-the-ranch" income.

Labor resources were limited. This is a family owned and operated ranch. The laborers are a husband and wife, with the assistance of four college-age daughters. Contract workers were hired three times a year: spring calf work, summer hay production and fall herd work. All other work was accomplished by the family.

Cattle resources were 164 cows for FY1999. The cow herd consisted of three different phenotypes: 25% of the herd is East Texas Brahman-influenced cows, 25% Angus-influenced cows and 50% Simmental-influenced cattle. The bull battery for FY1999 consisted of eight Simmental bulls.

Management of the resources can be divided into five areas: reproduction, nutrition, herd health, marketing and recordkeeping. The breeding season for FY1999 was January 19, 1998 to August 5, 1998, 209 days of bull exposure. The calving season started on November 1, 1998 and concluded on May 1, 1999, totaling 182 days. The calves were weaned in two groups on two different dates: July 1 and September 1, 1999. The average weaning age was 240 days. All of the bulls were evaluated for breeding soundness in late December of 1997, 30 days prior to the breeding season. The cattle were palpated for pregnancy status in October of 1999.

The nutritional program was divided into two sections: grazing management and winter supplementation. The ranch was on a continuous grazing program. The cattle were stocked at one cow-calf unit to 4.46 acres. They were supplied with a chelated loose mineral that is high in copper and selenium^a. The mineral was changed slightly 30 days prior to winter supplementation by utilizing a chelated loose mineral with high copper, selenium and magnesium^b. Annual soil samples were taken in the hay field, the native pasture and the field where winter perennials were planted. The hay field and winter pastures were fertilized and limed within the guidelines of the extension service recommendations.

The winter supplementation program for the cow herd consisted of rye grass pasture, round baled coastal hay, and protein cubes. The cows were fed 10 to 15 lb of coastal Bermuda grass hay daily and 5.0 lb of 21% protein cubes^c every other day. The heifers were fed 8 lb of an 11% crude protein grain supplement^d and access to 15.0 lb of hay daily. The bulls were fed 10 to 20 lb of 11% crude protein grain supplement^d and had access to 28 to 35 lb of hay daily. The cows and bulls had daily access to the perennial rye pasture. The cattle were fed 1,620 lb of raised or purchased feed per breeding cow unit over the winter.

The health program for the adult cattle consisted of bi-annual vaccinations and dewormings. The adult cattle were vaccinated in the spring and fall with a vaccine that contained a chemically-altered strain of infectious bovine rhinotracheitis (IBR) and parainfluenza-3 (PI3) viruses, modified live bovine respiratory syncytial virus (BRSV), inactivated bovine viral diarrhea virus (BVD) and cultures of five *Leptospira* serovars (Lepto 5-way): *Leptospira canicola*, *Leptospira grippotyphosa*, *Leptospira hardjo*, *Leptospira icterohaemorrhagiae*, and *Leptospira pomona*, and an inactivated vibrio culture^e. The adult cattle were also given an 8-way clostridial bactrin^f in the spring and fall. The adult cattle were dewormed with an avermectin dewormer^g in the spring and an albendazole dewormer^h in the fall. The adult cattle were sprayed for flies in May, August and October with an organophosphateⁱ.

The calves were vaccinated with a chemically-altered strain of IBR and PI-3 viruses, modified live BRSV, inactivated BVD virusⁱ, a pasteurized toxoid^k and an 8-way clostridial bacterin^f at 2 to 4 months of age. These vaccines and bacterins were repeated in 30 days. All calves were implanted with a growth promotant^l, dehorned, individually identified with ear tags, and the bull calves were castrated at 2 to 4 months of age.

The replacement heifers were selected by size, conformation and breed type in the fall. All the replacement heifers were home grown and developed. The heifers were vaccinated at weaning with a chemically-altered strain of IBR and PI-3 viruses, a modified live BRSV, inactivated BVD virus, and inactive culture of 5 leptoserae, and an inactivated vibrio culture^e. The heifers were also vaccinated with an 8-way clostridial bacterin^f, pasteurized toxoid^k, and brucellosis vaccine^m. The replacement heifers were dewormed with albendazole^h in the fall and avermectin^g in the spring.

The marketing program consisted of forward contracting with a cattle buyer. The calves were marketed around the first of September. All calves were sold except the selected replacement heifers. The cull cows were selected on age and reproductive status and were marketed through a local livestock auction in the fall or early winter. Cull bulls were sold as a result of age or injury through the local livestock auction.

Recordkeeping management was accomplished through hand-written documentation and a computerized spreadsheetⁿ. The majority of the production documentation was the responsibility of the ranch owner and his second-oldest daughter. The production information was collected from the computerized spreadsheet,ⁿ and the ranch's financial information was collected from IRS tax forms-Schedule F and the ranch checkbook. This production and financial data was then utilized to complete the Standardized Performance Analysis (SPA).

Production Outcomes

All production information was based on the number of females that were exposed to the bull during the breeding season. The pregnancy percentage for the baseline year of 1999 was 92.99%. The pregnancy loss for 1999 was 12.51%. The calf death loss for this baseline year was 4.88%. There was some confusion about the documentation of where the calf loss was occurring. The owner was interviewed to determine how the losses were being documented. The owner categorized calf losses as calves that were observed alive, but were found dead later. The pregnancy losses were categorized as all other deaths. The pregnancy loss and calf loss measurements were redefined for the producer. Pregnancy loss was defined as cows that were palpated pregnant that did not deliver a calf. The calf death loss

was defined as the number of calves that were born alive but did not wean. The owner documented all calf deaths into four categories: abortions, stillbirths-calves born dead, normal delivery but failed to thrive, and dystocia but failed to thrive. The 1999 calving percentage was 80.49%. The weaning percentage or calf crop percentage was 75.61%. The female replacement rate percentage for the baseline year was 4.88%. The average weaning weight for heifers and steers in the fall of 1999 was 595 lb. The heifers' and steers' weights were not determined separately. Pounds weaned per exposed female were 450 lb. Pounds weaned per acre utilized were 101 lb. The 1999 weaned calf pay weight price was \$73.21/cwt for steers, \$70.96/cwt for heifers and \$71.76/cwt for the combined average of heifers' and steers' pay weight price. The marketing of cull cattle was through a local livestock auction. The cull cows and bulls were sold for \$30.45/cwt and \$40.90/cwt, respectively.

Financial Outcomes

The financial outcomes from the FY1999 SPA were expressed as financial performance and financial efficiency. The financial performance was associated with feeding and total operational costs. The FY1999 raised/purchased feed cost per cow was \$153.61. The grazing cost per cow was \$78.51. The total operational costs, before non-calf revenue adjusted, per cow were \$565.55. The non-calf revenues were from the selling of adult cull cattle. Total operational costs, before non-calf revenue adjusted, per cwt were \$125.64. Total operational costs, non-calf revenue adjusted, per cow were \$532.81. Total operational costs, non-calf revenue adjusted, per cwt was \$118.37. The net income after withdrawals per cow was -\$205.49. The net income after withdrawals per cwt was -\$42.30. The FY1999 percent return on assets at market value was -17.35.

Financial efficiency correlates financial investments ability to generate income. There are five financial ratios that calculate financial efficiency. The 1999 asset turnover ratio was 88.58%. The operational expense ratio was 105.43%. The depreciation expense ratio was 31.58%. The interest expense ratio was 6.18% for the fiscal year of 1999. The net farm income from operation ratio (NFIFO) was -43.19%

There were numerous changes recommended for this ranch through the Texas Beef PEP consultants. FY1999 was the baseline year for the process of collecting of historical data, production information and financial data. Every year the process of data collection and assembly, review and analysis, and goal-setting with a list of recommendations were accomplished. This process is the mainstay of the Texas Beef PEP program. The production and financial outcomes are summarized in the following tables. The first table has a summary

of the herd resources and management from 1999 to 2001. The second table has a complete synopsis of the production performance from 1999 to 2001. The financial performance for the baseline year 1999 and the following two years can be found in Table 3. Table 4 has the financial efficiency ratios for three years including 1999, 2000 and 2001. The last table is summary data for comparable SPA herds from 1991 to 2001. The management changes that are behind these outcome numbers are detailed in the discussion.

Discussion

Production analysis and outcome based economics are a very important process in modern agriculture operations. Veterinarians are frequently asked to make recommendations about production problems without baseline production or economic knowledge. Veterinarians that make decisions without full knowledge of the ranch's management system, production level, or economic situation could cause more harm than good. Most production problems are multi-factorial and do not have

a single cause and answer relationship. A decision in one production area can influence outcomes in other areas. All management decisions should be viewed in this light.

The consultant phase of this project was a three step process. The first step was to document production and financial information. The second step was to analyze the information and gain understanding of the ranch situation. The third step in the consultant phase was decision making and goal setting. This process was repeated yearly, gauging the production progress or failures by their economic outcomes. There were opportunities for improvement identified in five management areas that influenced the production and financial success of this ranch during this project. These five management areas were reproduction, herd health, nutrition, marketing and recordkeeping. These areas should be managed in a holistic manner, realizing their interdependence.

The first opportunity for change that was identified in the management of the reproduction program for the baseline year of 1999 was to address the high

Table 1. Herd resource and management.

	1999	2000	2001
Herd inventory	164	141	172
Annual rainfall (inches)	25.00	50.0	64.0
Breeding days	209	181	139
Calving season in days	182	151	151
Average weaning age in days	240	240	240
Raised/purchased feed per cow unit (lb)	1,620	3,131	2,241
Grazing acres for exposed female	4.46	4.95	4.44

Table 2. Production performance.

	1999	2000	2001
Pregnancy percentage	92.99	86.86	93.29
Pregnancy loss percentage	12.51	6.76	4.81
Calving percentage	80.49	83.11	88.48
Calf death loss percentage	4.88	3.38	7.88
Weaning percentage	75.61	79.73	80.61
Female replacement rate percentage	4.88	7.43	17.58
Heifer weaning wt. (Lb)	595	586	623
Steer weaning wt. (Lb)	595	696	651
Average weaning wt. (Lb)	595	639	636
Pounds weaned per exposed female	450	509	513
Pounds weaned per acre	101	103	116
Pay wt. Price steer (\$/cwt)	73.21	86.00	89.92
Pay wt. Price heifer(\$/cwt)	70.96	85.00	84.92
Pay wt. Price average (\$/cwt)	71.76	85.53	87.42
Cull cow price (\$/cwt)	30.45	30.90	40.00
Cull bull price (\$/cwt)	40.90	50.00	55.00

Table 3. Financial performance.

	1999	2000	2001
Raised/purchase feed cost per cow	153.61	149.70	108.67
Grazing cost per cow	78.51	161.84	175.48
Total operational costs, before non-calf revenue adjusted, per cow	565.55	583.59	480.61
Total operational costs, before non-calf revenue adjusted, per cwt	125.64	109.13	97.66
Total operational costs, non-calf revenue adjusted, per cow	532.81	520.64	375.34
Total operational costs, non-calf revenue adjusted, per cwt – unit cost	118.37	97.36	76.26
Net income after withdrawals per cow	(-205.49)	(-56.53)	74.40
Net income after withdrawals per cwt	(-45.65)	(-10.57)	15.12
Percent return on assets – market value	(-17.35)	(-2.95)	9.28

Table 4. Financial efficiency ratios.

	1999	2000	2001
Asset turnover ratio	88.58	98.87	166.02
Operational expense ratio	105.43	83.48	70.70
Depreciation expense ratio	31.58	14.12	4.38
Interest expense ratio	6.18	3.64	2.51
Net farm income from operational ratio	(-43.19)	(-1.24)	22.41

Table 5. SPA data 200-600 Head 1991-2001.⁵

SPA Performance	TOP 25%	2 nd 25%	3 rd 25%	Low 25%	Average
Number of herds	30	30	29	30	118
Pregnancy percentage	86.3	83.1	77.4	82.1	82.2
Calving percentage	87.9	86.3	81.4	83.8	84.9
Calving death loss	2.7	3.7	4.3	2.7	3.4
Weaning percentage	85.7	82.7	77.3	80.6	81.6
Weaning wts steers and bulls (lb)	580.90	567.50	518.20	526.50	548.60
Weaning wts heifers (lb)	548.70	533.70	478.00	503.70	516.30
Average weaning wts (lb)	565.00	553.40	507.50	514.60	535.40
Pounds weaned per exposed female	483.40	456.40	390.20	417.10	437.10
Grazing acres per exposed female	25.4	20.9	11.4	22.8	20.2
Pounds weaned per acre	43.5	34.1	61.9	34.5	43.6
Pay wt. Price steers/bulls (cwt)	86.65	82.05	84.01	78.05	82.76
Pay wt. Price heifers	82.30	78.36	74.90	75.22	77.77
Pay wt. Price – weighted average	84.58	80.20	82.42	76.48	80.98
Raised/purchased feed cost per cow	57.31	65.83	68.75	74.04	65.86
Grazing cost per cow	75.16	79.49	67.43	73.90	74.14
Total cost before non-calf adj. Per cow	359.48	387.50	419.14	500.87	415.51
Total cost before non-calf adj. Per cwt	70.78	85.49	109.00	119.89	96.07
Total cost non-calf adj. Per cow	312.93	356.5	367.51	501.42	383.69
Total cost non-calf adj. Per cwt unit cost	61.20	77.83	94.33	120.00	88.20
Net income after withdrawal per cow	131.81	23.19	-48.25	-170.3	-15.02
Net income after withdrawal per cwt	26.08	5.56	-12.52	-41.89	-5.54
Percent return on assets – market value	6.46	2.49	-1.34	-8.95	-0.32

pregnancy loss percentage of 12.51%. The industry's goal for pregnancy loss is 3 to 5%. Hamilton states that pregnancy loss percentage is a good indicator of reproductive performance.³ If this measurement is high it

might indicate a late pregnancy reproductive disease problem that caused an abortion.³ This was not the case on this ranch. The high pregnancy loss percentage was a result of the producer's confusion about the definition

of pregnancy loss. This confusion led to the inaccurate categorizing of calf losses. The FY2000 and FY2001 pregnancy loss percentage were 6.76 and 4.81, respectively. The calf losses were not due to a pregnancy loss, and it is important to remember that reliable information is mandatory prior to offering recommendations. The pregnancy percentages for all three years of the project were 92.99, 86.86 and 93.29%. The ranch's pregnancy percentages rank in the top 25% of the herds in the database for all three years. The calving percentages for the three years are 80.49, 83.11 and 88.48%. The calving percentage is an indicator of breeding and gestational management. This ranch's calving percentages rank in the lowest 25% of the herds in the database for 1999, lower 50% in 2000 and the top 25% in 2001. Calving percentage is dependent on pregnancy losses percentage. High pregnancy losses result in lowered calving percentages. Pregnancy losses are associated with failures in the vaccination program against reproductive diseases, poor nutrition or feedstuff quality and bio-security breakdowns. Most of the reduction of the pregnancy loss percentage was accomplished by assuring that the calf deaths are categorized correctly.

The second opportunity for change in the area of reproduction involved calving percentages. There was an improvement in the calving percentage that was ascribed to the reduction in the length of breeding season. The breeding season was reduced from 209 days in FY1999 to 139 days in FY2001. This reduced the calving season from 188 days to 151 days. Good calving management has been difficult to attain because of the lack of observation time due to the owner's "off-the-ranch" employment. Most calving observation was accomplished before and after work. The reduction in the breeding season assisted in the calving management by reducing days of observation. An added benefit of reducing the breeding season was increasing the uniformity of the calf crop for better marketing.

The last opportunity for change that was identified in the reproductive program was the utilization of a low birth weight expected progeny difference (EPD) bull on the heifers. The owner's work schedule, which limited his calving observation time, influenced this management decision because dystocia on this ranch usually resulted in a calf death loss. Also the changing of the bull battery because of marketing purposes will have a positive effect on calving percentage and weaning percentage for the entire herd. The introduction of Red Angus bulls should decrease the dystocia rate, thereby increasing the number of calves born alive.

There were several opportunities for change identified in the herd health management program that could improve the production and financial performances. The first change related to the percentage of calves that were born alive, but died prior to weaning,

which is the definition of the calf death loss percentage. The calf death loss percentages for the three years are 4.88, 3.38 and 7.88%, respectively. Calf death loss percentage is a useful tool for evaluating the herd health, calving environment, calving management and dystocia protocol, nutrition program, and genetic selection.³ Calf death loss for the SPA database averages 3.4%.⁶ The reclassification of pregnancy losses increased the calf death loss percentage. The majority of the calf loss on this ranch was associated with birth and the first few days of life. The major cause of neonatal loss industry wide is due to complications associated with birth. The long term approach to reduce the calf loss is the introduction of the Angus bulls. The lower dystocia rates associated with these bulls should assist in the reduction of calf losses.

The second herd health program change dealt with the high percentage of the annual adult cow mortality. The adult cow death rate should be less than 1% a year. This ranch has lost approximately 3% of the adult herd per year, for several years. The identification of the disease, anaplasmosis, the treatment of infirmed cattle and the instigation of a vaccination program against anaplasmosis, has reduced the annual adult cow death loss below 1%.

The last opportunity for change in the herd health program that was identified was the deworming of suckling calves at 2 to 4 months of age to increase weaning weights. Smith and Wikse both indicate in their research that weaning weights can be improved a conservative 17 to 37 lb by deworming suckling calves.^{7,10} The average weaning weights for FY1999 and FY2000 were 595 and 639 lb, respectively. The deworming of the suckling calves influenced this increase of 44 lb, taking into account that there are numerous influences on weaning weights, but this was the only documented change.

The next management area that had opportunities for change that would move this ranch towards profitability was the nutrition program. Profitability is influenced greatly by nutrition issues. One of the biggest influences on this ranch's nutrition program was a four year drought that ended in FY2000. Drought increased the cost of production due to the lack of pasture forage and the cost of purchased feed to resolve the nutritional deficit. This event has impacted this cattle operation for the last four years. The raised/purchased feed cost per cow was \$153.61. This ranch would be in the bottom 25% of the SPA database. The average grazing cost per cow for the database was \$74.14, and for this ranch in FY1999 it was \$78.51. The first opportunity for improvement was to work on the reduction in the cost of feed and the amount of labor associated with the current winter feeding of a 21% crude protein cube. This feed was not a bulk feed, but a sack feed, which made it very labor intense and expensive to feed. The

cow herd was divided and two different protein supplementations were fed: 22% salt-limited range meal^o to one half of the herd and 32% crude protein liquid feed^p to the other half. The different programs would be evaluated on cost reduction, and owner's labor inputs.

The raised/purchased feed per breeding unit increased from 1620 lb in FY1999 to 3,131 lb in FY2000. The reason for the dramatic increase in pounds per unit was due to a miscommunication on execution of the feeding instruction. The owner fed 32% crude protein liquid feed and 22% salt limited range meal to the entire herd. This increased the pounds fed per unit by 52%. The cost of raised/purchased feed per cow decreased from \$153.61 in FY1999 to \$149.70 in FY2000. The raised/purchased feed cost per cow dropped 2.5% in spite of the doubling of the winter protein supplementation. It would have been expected that there would have been an increase in the raised/purchased feed cost, but the reduction of herd inventory and the price discount of bulk feed versus sack feed minimized the effect. The cost analysis of the range meal versus the liquid protein revealed that the range meal was more cost effective, and both were less labor intense compared to sack feed. The range meal became the protein supplement for winter feeding. The raised/purchased feed per breeding unit in pounds for FY2001 was 2,241. There was a reduction of 890 lb of feed fed per breeding unit, a 28% reduction in feed utilization from FY2000. The reduction in raised/purchased feed cost per cow was \$41.03 in FY2001, a 27% reduction. There was an overall reduction in raised/purchased cost per cow from FY1999 to FY2001 of \$44.94, a 29% reduction.

The grazing cost increased from \$78.51 per cow in FY1999 to \$161.84 in FY2000. This increase of \$83.33 per cow was due to improved allocation of expense by the owner to the grazing program. The majority of the grazing expense was associated with the planting of the improved perennial winter pasture. The ranch has always utilized winter perennial pasture for a portion of their winter supplementation program. There were year to year increases associated with the re-seeding, planting, fertilization, repairs, maintenance, insurance, and chemical treatments of an improved perennial pasture, but a 52% increase in one fiscal year was most likely associated with allocating expenses differently. The grazing cost per cow increased slightly to \$175.48, an increase of 7.8% in FY2001. The majority of this increase in grazing cost was associated with custom farming hiring costs.

It is difficult to evaluate the entire feeding program because of the allocation issue. The total nutritional costs per cow, raised/purchased feed and grazing costs, for all three years were \$232.12, \$311.54 and \$284.15, respectively. The allocation issue associated with the grazing costs makes it appear that the ranch's

nutritional program is becoming less profitable. The opposite is true. The ranch has reduced feed costs, decreased the labor requirement associated with winter feeding and has utilized a more appropriate ration. The cost of grazing management, hay production and protein supplementation are important budget issues. Efforts should be made to reduce or eliminate their cost or need. Low cost producers in this region have eliminated most of their dependence on hay production and winter protein supplementation, and depend and utilize continuous grazing systems to lower their cost of production.

The last issue to address in the nutrition program deals with the feeding of bulls and heifers. The basis for the heifer development and bull maintenance diets was an 11% crude protein grain supplement. This protein supplement was deficient in protein and cannot efficiently maintain microbial activity in the rumen without increasing the consumption levels to the extreme. The heifers' and bulls' nutrition program was changed to a less labor intense and lower cost 22% salt-limited range meal, which would satisfy the microbial protein requirement.

The next area of management which had opportunities for change was in the marketing program. The changes needed to improve the ranch's ability to move towards profitability are centered on cattle inventory and bull selection. The marketing plan that this ranch has utilized was forward contracting with a cattle buyer. The drought caused a reduction in herd inventory to 141 head in FY2000. This ranch can maintain a stocking rate of one cow/calf unit per 4.0 acres. The herd inventory could be increased to 200 head. A herd of that size would improve marketing strategy by having the ability to fill two cattle trucks at 50,000 lb per truck and the ability to raise replacement heifers based on an annual female replacement rate of 20%. The bull battery has changed dramatically in this three year project. The genetic changes have been cattle buyer driven through financial incentives. The Simmental bulls have been replaced by Red Angus bulls because the buyer can market the ranch's calves easier. The bull battery changed from eight Simmental bulls to five Red Angus bulls, one Red Simmental bull, and one Black Simmental bull. The Simmental-influenced cows (70% of the herd) are bred by the Red Angus bulls; the Angus and Brahman-influenced herd (30% of the herd) are bred by the Simmental bulls. The result of these changes is a calf crop that is more phenotypically uniform. Uniformity in calf weight was improved by reducing the breeding season by 70 days.

The last management area that had opportunities for change to improve profitability was in recordkeeping. The use of a Standardized Performance Analysis process was integral in the recordkeeping system. The abil-

ity to document, analyze, report and compare the ranch production and financial information against a regional, state and national database was the foundation for recommendations for improving profitability, and the motivator to accomplish them. The addition of an accrual computerized accounting system^a was a major factor that influenced the reduction of operational expenses. This system gave the producer the ability to track monthly expenses and greatly enhanced his ability to manage his expense allocations.

The changes that were discussed in the five management areas greatly influenced the production performance, financial performance and the financial efficiency ratios. The production performance can be assessed in a variety of ways. Weaning weights have been traditionally utilized to base production accolades. The problem associated with this is that weaning weights can be greatly influenced by environmental conditions, age of weaning, and if allowed to increase unchecked can lead to lower profitability. The best measure of production performance from a herd production standpoint is pounds weaned per exposed female.⁶ Pounds weaned per exposed females combines the herd reproductive rate, calf death loss, and genetics for growth and maternal traits into one production measure.⁶ The pounds weaned per exposed female dramatically increased from 450 to 513 lb in 1999 and 2001, respectively. This places the ranch in the top 25% of the SPA database for all three years, which averaged 483 lb. The age at weaning and distribution of calving can influence this measure and makes it more a value of an individual operation than a comparison between ranches.³ This ranch's improvement in pounds weaned per exposed female was a significant 63 lb. There were several management decisions that influenced this gain. The overall increase in pounds weaned per exposed female was a function of a 5% increase in weaning percentage, and a 6.4% increase in pounds weaned. The management decisions that influenced these increases are the reduction of days in the breeding season, utilization of easy-calving bulls, better dystocia protocol, nutritional improvements, better herd health and better parasite control. This ranch has improved the production side dramatically with a 9.6% increase in the pounds weaned per exposed female statistic. There is a point where profitability is determined by operational expense reduction. It is felt that when the pounds per exposed female reaches 505 lb, the producer has reached a production plateau and expense reduction is where profitability improvement lies.⁷

There was an impressive financial turn around on this ranch in the three years of the project. One of the most important issues surrounding a SPA process is determining the ranch's cost of production or total operational costs, non-calf revenue adjusted, per cwt. The

ranch in FY1999 had a unit cost of production of \$118.37/cwt. The average pay weight price for the weaned calves was \$71.76/cwt for FY1999, which was drought depressed. The net income after withdrawals per cwt was -\$42.30. The return on assets at market value was -17.35%. The ranch was losing equity. The only way that this ranch survived the drought of the FY1999 was to subsidize the ranch with "off-the-ranch" income, to sell assets and reduce cost by not taking the family withdrawal of \$10,000 per year.

The total operational cost, non-calf revenue adjusted, per cwt dropped \$21.01 to \$97.36 in FY2000. There was a reduction in total operating costs by 17.7% in FY2000. There was an increase in the pay weight price for FY2000. The combined steer and heifer pay weight prices per cwt rose to \$85.53. The problem in FY2000 was the operational costs were still high; the unit cost of production was \$0.97 per pound. The net income after withdrawals per cow was -\$97.03, and the net income after withdrawals per cwt was -\$18.15. The percent return on assets at market value was -2.95%. The ranch was still losing equity in FY2000. The owner opted not to take the annual family withdrawal of \$10,000, and this reduced the ranch's annual loss to \$26.11 per cow. The rest of the FY2000 deficit was off set by "off the ranch" income.

The total operational costs, non-calf revenue adjusted, per cwt decreased dramatically in FY2001 to \$76.26. This is a 22% reduction in total operational costs. The net income after withdrawals per cow improved to \$74.40. The ranch did not lose equity in FY2001 and had a positive 9.28% return on assets at market value. FY2001 was a very good market year in this region. The average pay weight price for the ten year SPA database was \$84.54/cwt for the top 25% of producers. The pay weight price average for heifers and steers was \$87.42/cwt for the ranch in FY2001. This increase in market price or the market effect was significant in increasing profitability and adding to ranch equity in FY2001.

The overall profitability of the ranch improved due to an increase of production performance and a reduction of ranch operational expenses. Use of the financial efficiency ratios can determine the trends in asset utilization, operational expenses, depreciation, interest and net income without having to sort through a chart of accounts. Financial efficiency ratios demonstrate the relationship between financial investments and their ability to generate income.² The critical issue is how effective the ranch assets generate income. The first financial efficiency measure is asset turnover ratio. The asset turnover ratio compares gross revenue (income statement) with total average asset (balance sheet).² As financial efficiency improves the asset turnover ratio increases in percentage. The asset turnover ratios for FY1999 through FY2001 were 88.58, 98.87 and 166.02%,

respectively. The asset turnover ratio increased by 77.44 percentage points for FY1999 to FY2001, or a 47% improvement. This improvement indicates that the assets are generating more gross revenue.

There comes a point in all business ventures that overhead reduction is the key to profitability. Operating expense ratio is used to track variable expenses. Operating expense ratio is the percentage of the gross revenue that must be utilized to offset variable or production expenses.² Increases in the operating expense ratio indicates more revenue is needed for production expenses, which results in less net revenues. A high ratio indicates financial inefficiency. The operational expense ratios for FY1999 through FY2001 were 105.43, 83.48 and 70.7%, respectively. There was a reduction in the overall operational expense ratio of 34.73 percentage points from FY1999 to FY2001, a total reduction of expense of 33%. The ranch has become more financially efficient.

Dalsted states that depreciation is the normal re-investment that must occur annually to maintain status quo. The Internal Revenue Service views depreciation as a non-cash cost.² Dalsted explained that this is not entirely true, and that it can be a serious cash expense because all businesses have to reinvest to maintain viability over time. Depreciation expense ratio indicates the percentage of gross revenue that depreciation is consuming. High depreciation expense ratios implies over-capitalization, relative to revenue potential.² Depreciation expense can interfere with the ranch's ability to service debt, and can cripple its cash flow and decrease liquidity and solvency.²

The depreciation expense ratios for FY1999, FY2000, and FY2001 were 31.58, 14.12 and 4.35%, respectively. Depreciation expense was reduced by 27.2 percentage points in a two year period; this was an 86% reduction in expenses. Depreciation expense was one of the major reasons the total operational costs, non-calf revenue adjusted, per cow decreased from the high in FY1999 of \$532.81 to the low in FY2001 of \$375.34, a savings of \$157.47 per cow.

Interest expense ratio is a key ratio in regard to financial efficiency.² Interest expense is a primary fixed cost, which includes interest on real estate, machinery, breeding stock and operational loans. If a large percentage of the gross revenue is servicing interest expense, it decreases funds for operation. The FY1999, FY2000 and FY2001 interest expense ratios were 6.18, 3.64 and 2.51%. There was an overall reduction in interest expense of 59.4% from FY1999 to FY2001. The interest expense ratio, the amount of the gross revenue that is servicing the interest expense, was also reduced substantially in FY2001.

Profitability is the key to increase ranch equity. The retention of net income, revenues minus expenses,

is the major method by which commercial producers increase ranch equity. The recommended measure of profitability is net farm income from operation (NFIFO). The NFIFO excludes the revenue sales from capital assets, like machinery or land, because it can distort this financial indicator significantly from year to year. The net farm income from operation ratio is the net percentage of the gross revenue that remains as retained earnings after operational expenses.² Profitability on a ranch is demonstrated by an increase in the NFIFO ratio. This ratio must remain a positive value over the life of the ranch to sustain viability. The NFIFO ratio for FY1999, FY2000 and FY2001 were -43.19, -1.24 and 22.41%, respectively. This was an improvement of 65.6 percentage points from FY1999 to FY2001. NFIFO ratio is sometimes called a profitability ratio, and when positive the ranch increases in equity. There were several reasons that the net farm income from operation ratio improved dramatically. Clearly, from the other financial efficiency ratios, there was a substantial decrease in operational, depreciation and interest expenses. All of the financial efficiency ratios are individual ranch measurements because of the ranch to ranch variation on issues like cash flow, capitalization, debt management, depreciation and interest expense.

The success in the three year Texas Beef PEP program was demonstrated by the improvements in production and financial performance, and can be attributed to three innovative and holistic components. The first component was the team approach. The building of a team that had local production and environmental knowledge (local veterinarian and county extension agent) with a panel of professionals (university specialists: veterinarians, economists, nutritionists and animal scientists) with expertise in all aspects of cow-calf production was a vital key to the success of this project.

Incorporating the SPA process into this project was the second component and a key point. Historians and politicians frequently quote the phrase "How do we know where we are going if we don't know where we have been?"⁸ Customized, appropriate, current, and accessible information is essential to the evaluation process.⁸ There have been numerous efforts by cattlemen associations, veterinary societies, and animal science communities to standardize ranch production and economic information. This effort led to the development of the concept of Integrated Resource Management (IRM), a problem solving concept with all ranch resources being considered.¹ The IRM concept led to Standardized Performance Analysis because of the need to standardize the ranch's production and economic data into a useable format and the reporting of these outcomes to an established national and regional database.¹¹ This allows the evaluation and analysis of the ranch's annual information against those databases. SPA is more than just an

analytical tool; it is a standard-bearer and can be used as a motivator.

The most important component that had the greatest influence on the success of this project was an innovative producer. The producer had to be receptive to the recommendations and have the management ability to apply them to the production system.

Summary

The ability for the local participants (producer, veterinarian and county extension agent) to nurture a relationship with bovine experts (university and extension specialists) was essential for the success of the Texas Beef PEP program. This team effort allowed the local participants to take advantage of expert knowledge, and then use this knowledge to make production and financial decisions. This ranch moved towards profitability when this committed producer implemented these sound recommendations.

The sustainability of the commercial ranch depends on the ability of the producer to eliminate operational expenses by knowing their unit cost of production and increasing livestock production, through increasing efficiency and disease reduction, resulting in increased weaned pounds per exposed female. This was accomplished by annually collecting and documenting the production and financial data with a standardized information system, evaluating and analyzing the data, recommending management changes, and setting reasonable production and financial goals.

Footnotes

- ^a Vigortone 32S CTC Plus, Cedar Rapids, IA
- ^b Vigortone 32S Mg CTC, Cedar Rapids, IA
- ^c Standley 21% Hi Protein Cubes, Standley Feed and Seed, Madisonville, Texas
- ^d Beef Grower, Standley Feed and Seed, Madisonville, Texas
- ^e CattleMaster 4VL5, Pfizer Animal Health, Exton, PA
- ^f Ultrabac 8, Pfizer Animal Health, Exton, PA
- ^g Ivomec injectable, Merial Animal Health, Duluth, GA
- ^h Valbazen, Pfizer Animal Health, Exton, PA

- ⁱ Co-ral Spray, Emulsifiable Livestock Insecticide, Bayer, Agricultural Division, Animal Health, Shawnee Mission, KS
- ^j CattleMaster 4, Pfizer Animal Health, Exton, PA
- ^k Oneshot, Pfizer Animal Health, Exton, PA
- ^l Synovex C, Fort Dodge Animal Health, Overland Park, KS
- ^m Brucella abortus vaccine Strain RB51, live culture, Professional Biological Company, Denver, CO
- ⁿ Lotus spreadsheet, Lotus Development Corporation
- ^o Custom Mix #2, 22% crude protein salt limited range meal, Standley Feed and Seed, Madisonville, Texas
- ^p Super Lix 32% crude protein liquid supplement, Standley Feed and Seed, Madisonville, Texas
- ^q Quickbooks Pro, Intuit, Inc., Mountainview, CA
- ^r Herd, D. B., Presenter at the Texas Beef Partnership in Extension Program, Texas A&M University, College Station, Texas, August 20, 2002.

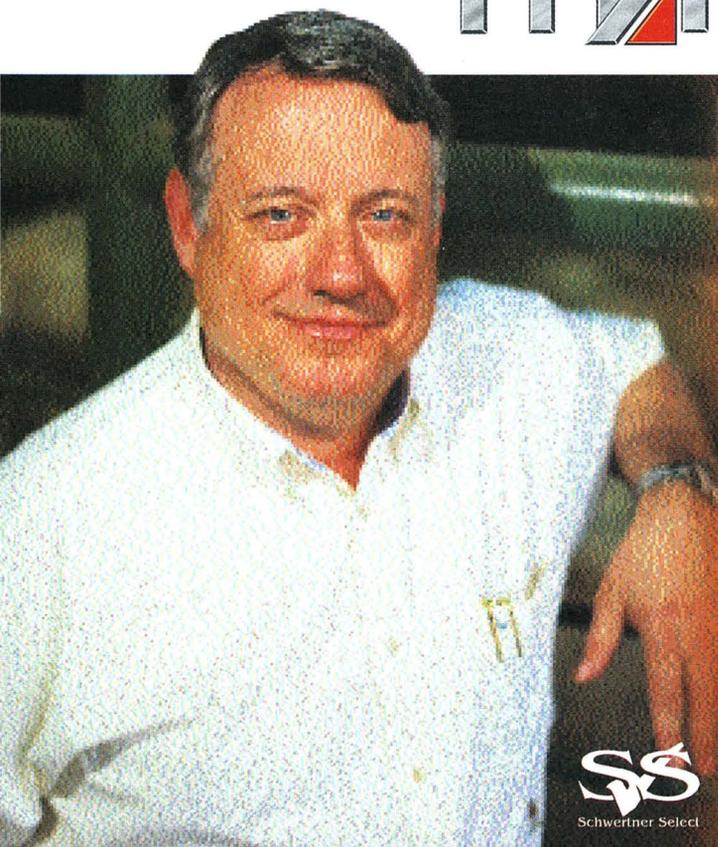
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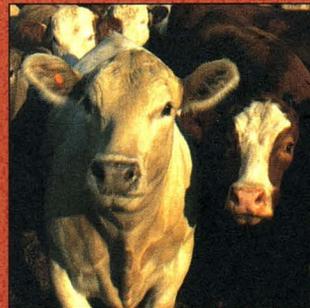
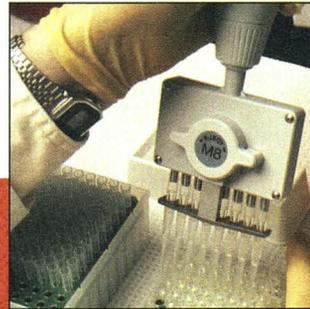
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