



Cow-Calf Financial and Production Performance: What We Are Learning from Standardized Performance Analysis (SPA) Data¹

Damona Doye

Extension Economist, Oklahoma State University

Sally Dolezal

Former Beef Breeding Specialist, Oklahoma State University

James McGrann

Extension Economist, Texas A&M University

High calf prices can hide a multitude of management sins. Low calf prices often force a closer look at production and financial practices. Looking at production costs may be painful, but it is the first step in looking at the farm or ranch as a collection of potential profit centers and determining which parts are coming up short. Cost-saving measures can be identified once the high cost items are noted. Production systems can be better matched to the resource base. Producers in the cattle business who are not profitable should minimize losses and better position themselves for the future.

Cow-calf Standardized Performance Analysis (SPA) software was developed by producers, extension staff, and the National Cattlemen's Beef Association Integrated Resource Management Committees to analyze production and financial performance jointly². SPA is used to develop and monitor key statistics over time (for example, cost per breeding cow or pounds weaned per exposed female). SPA reports are recognized as an invaluable tool in identifying the strengths and weaknesses of an individual operation. Costs that are out of line quickly become evident when compared to those of other producers around the country. This provides producers with reference points on how well the operation is performing physically and fiscally.

SPA Results

Individual producers have been submitting results to a national SPA data base since 1990. Because the "standardized" results are developed using common definitions and reporting techniques, they allow producers to compare their costs of production. Herds in the database include both commercial and purebred operations, as well as fall and spring calving herds.

Comparisons of average financial and production statistics for low- and high-cost producers in Texas, Oklahoma, and New Mexico are summarized in Table 1. Data is sorted into quartiles by net income (\$/cow). Producers with the highest

Oklahoma Cooperative Extension Fact Sheets are also available on our website at:
<http://osufacts.okstate.edu>

net income are labeled Top 25% (high income), followed by Second 25%, Third 25%, and finally Low 25% (low income). Highlights from analysis of the results include:

- Feed costs are generally the highest annual variable cost associated with the cow-calf production enterprise.
- Significant differences exist in total feed and grazing costs between low- and high-income producers.
- High income producers average cost of production is \$320 per cow compared to \$556 per cow for low income producers.
- High income producers have less invested per cow in all asset categories: current assets (e.g. cash and supplies), breeding livestock, machinery and equipment, and real estate.
- The high income producers' average cost of production is \$80 per hundredweight compared to \$159 per hundredweight for low income producers.
- Average weaning weights as well as pounds weaned per exposed female are higher for high income producers than low income producers.

Other analysis of SPA data (not shown in Table 1) has shown that costs of production are highest on average for herds with less than 50 cows and lowest for herds with 500-999 cows. While small herds can be profitable, it requires superior management to control costs. High-cost producers typically have higher debt levels per cow than low-cost producers. And, average weaning weight and profitability are not correlated.

The most profitable producers tend to have higher pregnancy, calving, and weaning percentages than low profit producers. Also, the calf death loss differs only slightly between the profitability levels.

Average weaning weight in the most profitable herds was 540 pounds compared with 502 pounds in the low profit herds. This pattern is also evident when reproductive success is accounted for at weaning. Average pounds weaned per exposed female is 457 pounds for the more profitable herds compared to 409 pounds for low profit operations.

Some producers assume that increased weaning weight ensures increased profitability for the cow herd. The cow-calf manager must determine the appropriate level of growth for an individual herd. Matching cow size to the available production resources as well as striving for uniformity of size has favorable management consequences. Beef producers must use information on genetic relationships between mature size and other growth traits to select replacement heifers and control cow size. For example, selection for increased yearling

¹ Revised from an earlier version by Damona Doye and Sally Northcutt (Dolezal).

² For more information, see OSU F-222, "Cow-calf Standardized Performance Analysis (SPA)."

Table 1. Financial and Production Performance for TX/OK/NM Cow-calf Producers.

<i>SPA Performance Measure</i>	<i>Top 25%</i>	<i>Second 25%</i>	<i>Third 25%</i>	<i>Low 25%</i>	<i>Average</i>
Total Raised/Purchased Feed Cost (\$/cow)	\$60	\$80	\$86	\$110	\$84
Total Grazing Cost (\$/cow)	76	73	77	110	84
Total Pre-tax Costs (\$/cow)	320	356	405	556	409
Net Pre-Tax Income (After Withdrawals) (\$/cow)	140	33	-40	-234	-25
Percent Return on Enterprise Assets (ROA)					
Cost Basis	11.0%	4.1%	-1.3%	-9.0%	1.2%
Market Value	7.0%	2.4%	-1.1%	-7.2%	.3%
Break-even Economic Cost of Weaned Calf Production (\$/cwt)	80	92	107	159	109
Total Investment per Breeding Cow (Cost Basis, \$/cow) ¹	\$2,097	\$2,225	\$2,314	\$3,112	\$2,437
Pregnancy Percentage (based on pregnancy tested herds)	86.7	86.4	81.1	82.0	84.0
Calving Percentage	88.2	86.5	85.2	84.0	86.0
Calf Death Loss	3.3	3.5	3.8	3.4	3.5
Weaning Percentage	85.0	83.0	81.1	80.7	82.5
Average Weaning Weight, lb.	540	527	522	502	523
Pounds Weaned per Exposed Female	457	435	425	409	432

¹ Economic costs include the opportunity cost of land, raised feed and equity capital. Land opportunity cost, for example, is the estimated rental rate that would be paid for owned land. Opportunity cost of capital is the rate of return that one would expect to earn on that capital in an alternative investment.

weight to an extreme may result in mature cows that are too large. With limited forage and feed resources, this cow type may not have acceptable reproductive success. This result impacts earnings as well as cost per breeding cow. To be a sustainable operation, breeding stock selection must consider resource limitations that impact the optimal growth and cow size.

Value of SPA Results for Individual Producers

“Measure, then manage” is a SPA project motto. Cow-calf SPA software condenses a large amount of production and financial information into convenient summaries and ratios for analysis. SPA results are most useful when annual results are available for year-to-year comparisons. SPA results can be used to do the following:

- 1. Identify areas of concern** by documenting costs of production and identifying which costs can be managed. SPA measures are most useful in directing managers to ask the right questions to solve business financial problems.
- 2. Develop and/or adopt tools to decide what to do.** The tools may include financial and production records, financial statements (cash flow statement, income statement, balance sheets), budgets (cash flow and enterprise), reports comparing actual to budgeted values.

What are the high-cost categories? Where are costs high relative to producers in the most profitable bracket? Comparing individual results to state and national averages may indicate that a specific cost component is high. The following notes are intended to stimulate thinking about potential causes of problems, evidenced through SPA results. No one idea is appropriate for all cases. Review the ideas given a situation and follow up with resource people with the appropriate expertise.

High feed costs?

- Buy purchased feed in bulk rather than in sacks.
- Save money buying feed rather than raising it (or vice versa). Is marketing hay or feed raised through the cows the best use for it? If hay is high quality, could it be sold in a specialty market and an adequate replacement be bought at a lower cost?
- Re-negotiate rental rates (cash or share rent) if they are higher than average rental rates for comparable tracts in the region.
- Reduce dependence on feed (reduce stocking rate; consider grazing rotations, overseeding, or limit-grazing cool season forages).
- Use chemicals on raised feeds only when it is economically advantageous.

- Shop around for the best supplemental feed values. Consider alternative supplement sources.
- Try to anticipate needs, and buy hay early in the season when prices are low.
- Avoid extremes in cattle size and milk production.
- Match cattle production cycle to forage resources, both in terms of availability and nutritive quality.
- Use a systematic approach in evaluating a herd nutrition program.
- Sort cows based on nutritional needs and feed accordingly.
- Minimize feed wastes through storage and feeding practices (for example, feeding hay in racks or rings).

Fact sheets from OSU that provide further information:

- PSS-2071, Sod Seeding Small Grains
- PSS-2559, Tall Fescue in Oklahoma
- PSS-2567, Grazing Systems for Pastures
- PSS-2570, Reducing Winter Feeding Costs
- PSS-2580, Short Duration Grazing on Native Range
- PSS-2584, Forage Budgeting Guidelines
- PSS-2585, Forage Legumes for Oklahoma
- PSS-2587, Bermuda grass for Grazing or Hay
- NREM-2869, Management Strategies for Rangeland and Introduced Pastures
- NREM-2870, Drought Management Strategies
- NREM-2871, Stocking Rate: The Key to Successful Livestock Production
- PSS-2901, OSU Agronomic Services Procedures for Soil, Forage & Water Testing
- ANSI-3010, Supplementing the Cow Herd
- ANSI-3017, Feeding High Protein Range Cubes
- ANSI-3027, Spreadsheet programs for Calculation of Complete Diets for Beef Cattle, Checking for Nutrient Balance & Estimating Gain

High grazing costs?

- Match the cattle production cycle to forage resources (availability and nutritive quality).
- Re-negotiate rental rates (cash or share rent) if they are higher than average rental rates for comparable tracts in the region.
- If the forage base includes annual pasture, use chemicals only when it is economically advantageous.
- Soil test improved pastures to determine when fertilizer is needed.
- Search for least cost weed control methods.
- Improve grazing management. Is stocking rate optimal?
- Renovate and improve pastures.

Fact Sheets from OSU that provide further information:

- PSS-2559, Tall Fescue in Oklahoma
- PSS-2567, Grazing Systems for Pastures
- PSS-2569, Native Grass Fertilization
- PSS-2570, Reducing Winter Feeding Costs
- PSS-2580, Short Duration Grazing on Native Range
- PSS-2584, Forage Budgeting Guidelines
- PSS-2587, Bermuda Grass for Grazing or Hay

- PSS-2758, Weed Control on Rangeland
- PSS-2857, Basic Principles of Grazing Management
- NREM-2869, Management Strategies for Rangeland and Introduced Pastures
- NREM-2870, Drought Management Strategies
- PSS-2871, Stocking Rate: The Key to Successful Livestock Production
- E-947, Invasion of Oklahoma Rangeland and Forests by Red Cedars and Ashe Juniper

High investment costs per cow?

- Sell unnecessary machinery, vehicles, cows, and other assets that do not contribute to profits.
- Emotional attachments to assets, cows for instance, can be costly. Does the herd size justify the machinery and equipment? Is the bull/cow ratio close to the optimum?
- Consider leasing rather than owning assets. Could grass be rented for less than it costs to own it? Leasing rather than owning may increase flexibility.
- Custom-hire if it is cheaper than owning machinery and providing labor (or hiring labor to do it).
- Do not try to “keep up with the Joneses” and avoid “new paint”. Defer new investments and consider buying used rather than new machinery, equipment, or vehicles.
- If the enterprise is profitable and resources are available, consider increasing the size of the herd to spread fixed investment costs over more cows.
- Manage heifers so they will have longevity in the herd. Replacing cows can be expensive.

High cattle costs?

- Use preventative medicine and practices to reduce “emergency” costs or losses.
- Plan vehicle use to minimize mileage.
- Shorten breeding/calving seasons and time between calves.

Fact Sheets from OSU that provide further information:

- ANSI-3260, Planning Calendar for Beef Cattle Herd Health
- ANSI-3358, Disease Protection of Baby Calves
- Circular E-869, Management of Beef Cattle for Efficient Reproduction

High interest costs?

- Shop around for the best deal.
- Lock in low interest rates for long-term loans when the opportunity arises.
- Use cash surpluses to pay down debt.
- Schedule loan repayments at times when crop and/or livestock sales are expected.
- Negotiate for lower rates if you have a good record keeping system and can provide financial statements for the lender.
- Minimize new borrowing.

High overhead costs?

- Consider increasing the size of the herd to spread overhead costs over more cows (if the enterprise is profitable).

A Fact Sheet from OSU that provides further information:

- AGECE-217, Understanding, Allocating and Controlling Overhead Costs

Note: Weigh potential revenue losses associated with changes to reduce costs to make sure it is the right decision.

Low pregnancy percentage?

- Be sure that cows have an adequate forage and/or nutritional plane.
- If cows are not settling, increase surveillance during breeding, evaluate cow condition during critical periods, and conduct breeding soundness exams on bulls.
- Build cattle with high fertility through systematic breeding, culling, and grouping.
- Control the breeding season. With continuous calving systems, a cow that does not calve in a given year may go unnoticed for awhile, meaning that unproductive cows typically stay in the herd longer than is desirable.
- Maintain effective herd health program.

Low calving percentage?

- Dead calves that are carried to term are included in the numerator for this calculation. A calving percentage significantly lower than the pregnancy percent suggests reproductive disease.
- As low pregnancy percentages contribute to a low weaning percentage, see also items under that heading.
- Be sure that cows have an adequate forage and/or nutritional plane.

A Fact Sheet from OSU that provides further information:

- Circular E-869, Management of Beef Cattle for Efficient Reproduction
- VTMD-9123, Immunizations for Oklahoma Cow Herds

Low weaning percentage?

- A weaning percentage lower than the calving percent suggests dystocia, scours, clostridial diseases, respiratory disease, or losses due to theft, predators, or road kill.
- Practice systematic breeding and culling to increase calving ease and consider grouping females to monitor difficult births.
- Use preventative medicine and practices to reduce death losses.
- As low pregnancy and calving percentages contribute to a low weaning percentage, see also items under those headings.

A Fact Sheet from OSU that provides further information:

- ANSI-3358, Disease Protection of Baby Calves

Low weaning weights?

- Use genetic selection and crossbreeding to improve uniformity of the cow herd/calf crop.
- Increase quality of grazed and harvested forage by utilizing forage tests and harvesting in a timely fashion.
- Be sure that cows have an adequate forage and/or nutritional plane.
- Shorten the breeding season.
- Set calving dates to capitalize on high quality forage production.
- Evaluate balance between forage production capacity and stocking rate.

Fact Sheets from OSU that provide further information:

- ANSI-3021, Spreadsheet to Estimate Returns From Creep Feeding
- ANSI-3011, Feeding Cattle on Grass
- ANSI-3159, Expected Progeny Difference: Background on Breeding Value Estimation
- ANSI-3160, Expected Progeny Difference: Growth Trait EPDs
- ANSI-3161, Expected Progeny Difference: Maternal Trait EPDs
- ANSI-3162, Expected Progeny Difference: Use of EPDs

Again, weigh changes in costs and returns to make sure a decision is the right one. The local extension office is a good source of information on all of the above subjects and can provide copies of the mentioned fact sheets.

Annual SPAs may raise “red flags” signaling a decline in the financial performance of the business. The first red flag is typically a negative cash flow. This may be a temporary problem if the operation is being expanded and/or new assets purchased. If negative cash flows persist, it can lead to economic losses. If the ranch does not generate an economic profit, then the assets could be earning more somewhere else. For example, if cows cannot pay market value for raised feed, the land on which the feed is raised could be rented out for more than it is earning in the cow-calf enterprise.

A more serious red flag is if the financial net income is negative. This signals that equity capital is being consumed. Each year that production continues with financial losses, equity is being consumed, leading to increasingly lower values for net worth. For ranches to survive in the long run, a positive return to labor and management, as evidenced by a positive net income and rate of return on assets, is essential. Equity increases in a viable business should result from retained earnings rather than capital contributed from off-farm jobs, inheritances, and appreciation in asset values.

Being aware of these signals and monitoring performance on an ongoing basis allows producers to correct problems before they get out of hand. Completing a SPA requires a commitment of time and energy but provides better information for management than either financial or production records can do alone.

Additional Notes....

Cost of production is only one part of the profit equation. Producers should also study marketing practices and alterna-

tive marketing options. Could an above break-even price be locked in using contracts or futures markets? Would profits increase by retaining ownership through a stocker or feedlot phase? Are there specialized markets? For instance, could “natural” beef be targeted? Are there other possible sources of revenue, such as hunting leases?

Cash shortfalls can occur even if an enterprise is profitable. They can be a temporary problem associated with debt servicing, building of inventories, etc. Negative net cash flows over time are likely to be signals of more serious problems including lack of profitability. Negative values for accrual net income indicate that the enterprise is currently not profitable. In this case, changes are needed in operations. Look at altering production practices, marketing, feeding, land management, cost control, or all of the above.

To Complete a SPA Analysis...

SPA focuses on financial results from a fiscal or accounting year and production records associated with the calf crop weaned in that year. For most producers, the fiscal year coincides with a calendar year. A set of farm financial statements supplemented by tax records and a depreciation schedule will supply the financial information needed to complete a SPA.

Reproductive measures are based on a full production cycle, beginning when all breeding age females are exposed to the bulls (or artificially inseminated). The cycle ends when the calves are weaned. To make accurate comparisons from one calf crop to the next, or between management groups or herds, these performance values are based on the number of exposed females (cows and first-calf heifers). Thus, cow numbers are needed for the period when the mothers of calves being weaned were exposed. Individual calf weights are not required. More information on the production and financial data required is found in OSU AGECE-222, “Cow-calf Standardized Performance Analysis”.

The initial SPA analysis may require some time and effort. Collecting the production and financial data is usually time consuming the first time an analysis is completed if records are in poor shape. However, when committed to improving management practices and exploring SPA capabilities further, there are several options:

1. When familiar with both production and financial standards, definitions, and computer use, order the SPA software and manual from Texas A&M and complete the analysis (<http://agecoext.tamu.edu/spa>)
2. Contact the local Extension Educator-Agriculture, area Agricultural Economics specialist, or Damona Doye, Extension Economist, at 405-744-9813 or ddoye@okstate.edu to express interest in a SPA workshop or individual assistance. Workshops are conducted upon request for five or more interested producers in an area.

Summary and Conclusions

Using SPA is a process, not an event, for producers that have participated. Change has to take place if completing SPA is useful to producers. Identified are areas where many cow-calf producers can reduce production cost.

- Minimize investment in depreciable assets such as machinery and vehicles.
- Monitor and control purchased feed expenses.
- Most small producers should buy replacements and use terminal cross bulls.
- Avoid expensive seed stock production and purchase replacement animals.
- Minimize investment in horses if the cows are expected to pay their expense.
- Don't overstock grazing land.
- Develop and integrate systems to manage all resources including wildlife.
- Have a controlled breeding season that will optimize grazing land use, minimize purchased feed, and result in high reproduction.
- Use proper health practices to ensure sound herd health and allow participation in marketing alternatives.
- Avoid industry fads that are not cost effective.
- Don't spend money to reduce IRS taxes if the investment is not a sound one that will increase after tax profits long run. It does not make sense to spend a dollar to save thirty cents.
- Have a bank account for the ranch separate from the personal account.
- Location and other amenities are important in acquiring land to realize appreciation in value. If a goal of land ownership is to cash in on expected increases in value, focus on attributes other than grazing potential.

The large differences in herd performance validate the necessity to measure and manage for performance. Ranchers can begin the process by completing SPA. Making a commitment to business management can be a significant step. Measuring and monitoring progress toward specific written goals, using the analysis to identify areas for change, and focusing on implementation. Measuring performance motivates managing for performance.

References

- McGrann, James and Shawn Walter. “Reducing Costs with IRM/SPA Data.” PE-102 1995 Cattlemen’s College. National Cattlemen’s Association Annual Meeting. Nashville, TN. January 25, 1995.
- Doye, Damona, Sally Dolezal, and James McGrann. “Cow-calf Standardized Performance Analysis.” OSU AGECE-222. August 2002. Revised.
- Doye, Damona, Sally Dolezal, and James McGrann. “Interpreting Cow-calf Standardized Performance Analysis (SPA) Results.” OSU AGECE-232. August 2002. Revised.

The Oklahoma Cooperative Extension Service

Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, gender, age, religion, disability, or status as a veteran in any of its policies, practices, or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 20 cents per copy. 0507