Cow-Calf Health Economics and Planning Decision Aids User Manual

Nothing is more "cost-effective" than a complete herd health plan developed under the guidance of a veterinarian and implemented in a timely manner. Implementing a health program will increase revenue and reduce losses if the correct program is implemented. Calves raised with the correct health program will avoid market discounts. The correct health program is cost-effective irrespective of herd size (see appendix A).

The data used are only examples. The local veterinarian can assist in getting correct numbers for a specific herd and locality.

This a. **Cow-Calf Health Economics** spreadsheet include the following information, data and calculations:

1. A list and cost of the vaccinations and other practices by category of cattle.
2. Cattle replacement cost, prices and herd investment.
3. Pregnancy test economics.
4. Delayed pregnancy and calving revenue loss calculation.
5. Cost of a herd culling for Trichomoniasis or Trich.
6. Benefits versus cost of breeding soundness exam (BSE).
7. Herd bull investment analysis.

The purpose of these decision aids is to facilitate getting a health and animal welfare plan on paper that reflects the veterinarian input. This is a reminder of what has to be done. It shows the costs and revenue impacts of practices and consequences of not implement the correct program.

Sheet 1 is a summary of health practices and the cost per head for the different categories of cattle. The cash budget likely will not match the annual cash outlay because expenses cross fiscal years. However, a listing of vaccination and practices is a good check list. And it gets costs into proper perspective. In most ranches the veterinarian and medicine or health are only 4-5% the total cost including both direct and indirect costs (see Appendix B.) Also check the IRS Schedule F "Profit of Loss From Farming" for these reported costs including breeding costs not recorded in this spreadsheet for the last fiscal year.

See Oklahoma State University Quality Beef Network, oqbn.okstate.edu for excellent information on health records and VAC-45 Enrollment data and information requirements.

Sheet 2 is a table of cattle replacement cost, prices and herd investment. The cow-calf herd is a very large investment. Any health or problem that requires culling breeding stock is very costly as salvage value is small relative to replacement cost. Any death loss is very costly.

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Sheet 3 addresses pregnancy test economics. It is one of the most cost-effective practices for a cow-calf herd. Pregnancy and weaning percentage are the most important measures of the herd performance. The sooner the pregnancy status is known the more cost-effective. As costs of keeping an unproduction exposed female is reduced and early detection means cull cow low fall seasonal prices can be avoided. For replacement heifers, open heifers can be quickly moved to the feeder heifer market.

There are alternative ways to pregnancy test. It's not so much a "cost issue" as it's a timing and accuracy question. Pregnancy testing is a very cost-effective practice. Again, engage the herd veterinarian in the decision process. Timely pregnancy tests can also help identify venereal disease problems like Trich.

Sheet 4 shows the delayed pregnancy and calving revenue loss calculation. Both sheets 3 and 4 helps keep costs and productivity in proper perspective. All efforts to have a short breeding season and high weaning percent needs to be a focus. The advantage of early calves on calf revenue is very large. A price slide is calculated to recognize lighter calves sell at a higher price. Note the income difference or revenue difference by cycle bred. Compare that to the BSE cost per exposed female using a sub-fertile bull that can be part of the reason for late calves.

Cow longevity is important as replacement cost is high relative to salvage value. The high cost of replacement is shown in Sheet 2.

Sheet 5. addresses the cost of a herd culling for Trichomoniasis or Trich. Other venereal diseases have similar financial impacts. The message is "do everything possible" to prevent these diseases. Trich can take the ranch out of a productive cow-calf business. Note the capital loss associated with a close down of a Trick infested herd. It is very high as infected breeding must go to slaughter.

Small cow-calf operations should always review the option of leasing the land for open space tax valuation qualification.

Sheets 6 and 7 includes the benefits versus cost of the breeding soundness exam (BSE) and herd bull investment analysis is addressed. See user manual supporting these sheets that follows.

Planning and Health Record Spreadsheets Included

To facilitate use of the annual planed health program a separate spreadsheet is includes as well as a spreadsheet to record health treatment information sheet. Again, the record sheets are developed for the Oklahoma State University Quality Beef Network, oqbn.okstate.edu for excellent information on health records and VAC-45 Enrollment data and information requirements.

Other Excel spreadsheet included are:

- ✓ Example Cow-Calf Health Plan
- ✓ Blank Cow-Calf Health Plan
- ✓ Cattle Health & Treatment Record

Using these spreadsheets facilitates "getting on the same page" with the herd veterinarian and employees.

Different "program cattle" have different records requirements so must be contacted for guidance. Video Auction's web sites also spell out data and information requirements. Verification companies will also guide data reporting efforts.

In summary, planning and implementation of a complete health program are very cost-effective for the cow-calf operation. The complexity of health issues and alternatives for implementation of available health programs does require the herd veterinarian involvement. These economic decision aids can assist in organization of data and doing the calculations. Do "what if" analysis does help view the financial implication of alternatives. Change the values in the **blue cells.**

When evaluating a practice cost be sure to divide the cost by heads of cattle and the number of calves or express the cost on a per pound of weaned calf. Get costs in the proper perspective!

Of course, the health program implementation is only one part of the total calf production and marketing system. Although health is a small part of total costs when compared to items like feed and grazing, labor and management, depreciation and overhead or indirect cost, a well implemented health program is one of the most cost-effective parts of the **total unit cost.**

Breeding Soundness Exam (BSE) Economics and Herd Bull Investment Cost User Manual

This decision aid addresses two topics:1. The economics of the breeding soundness exam (BSE) and 2. Herd bull investment and annual costs.

BSE Economics

The BSE exam is one of the cost-effective practices that a cow-calf operation can employ. Reproduction rate, weaning percentage based on exposed females, is the most important measure of the cow-calf enterprise performance. High reproduction rates cannot be achieved without breeding sound herd bulls.

The **herd veterinarian** is the key professional that should be involved in deciding on the necessity for doing the BSE and when timing would be most effective. During the BSE, the veterinarian will also identify physical or health problems that would warrant the culling and purchase of bull replacements. Recall the BSE costs include the veterinarian, lab fees, equipment and supplies involved, plus the owners added costs.

Potential Costly Problems With Sub-Fertile Bulls

1. In small herds a calf crop can be lost with one herd bull that is sub-fertile.
2. In larger herds the number of bulls can be inadequate if there are sub-fertile bulls causing the overall pregnancy to be lower.
3. If bulls are sub-fertile, females can go through breeding cycles without getting bred. Anything that delays the conception of females means the calves will be born later resulting in lower weaning weights and income even when bulls are left with females for a long breeding season. Delayed breeding is very costly as income is reduced for the light weaned calves.

An annual BSE can identify bulls to cull and decrease the risk of decreased pregnancy rates. If a BSE can reduce the number of bulls needed this would be a large annual cost saving. The bull investment cost spreadsheet calculates this annual cost.

The economic methodology employed is the revenue benefit versus cost summarized using a benefit-cost ratio or the dollar return for the dollar invested in the practice.

The BSE is a small cost when expressed per female exposed. If BSE results in elimination of sub-fertile or unsound bulls and the overall herd weaning percent increases, the benefit-cost ratio is high. The spreadsheet allows the employment of "what if" analysis by changing key variables. The most change is weaning percent based on the number of exposed females per bull.

Delayed calving date is evaluated by comparing the value of the weaned calf by breeding cycle. If bred in the first cycle, the calf will have a higher weaning weight than in a later cycle. It is an age of calf reality. A price slide is used to recognize the lighter calves have a higher price per Cwt. This can be compared to the cost of the BSE per exposed female.

Herd Bull Investment Analysis

Purchasing herd bulls as an investment is expected to pay out over 3 to 5 years. The ownership costs (depreciation, death loss and interest cost) are an annual cost spread over females serviced and calves produced during the bull's productive life. Depreciation is the purchased cost minus salvage value. Salvage value or cull bull net sales value is a portion of bull initial purchase cost and reduces annual bull depreciation cost.

The investment in a higher priced bull that can contribute to improved production of more market acceptable calves and better weaning weight for the cow-calf producer is **not that costly** when numbers are put into perspective for calves sired and as a percent of the breeding cows' total annual cost. The bull is an investment with a long-term pay out. Operating expenses like feed and grazing are annual costs. The number of calves required to pay for the bull is a good indicator to monitor the investment requirement.

This decision aid helps put the "bull investment" into proper cost perspective. Annual cost is calculated in terms of the number of cows serviced and what change would be required in weaning weight to pay for the higher priced bull. Calculated cost per calf and per cwt. of calf weaned per cow exposed are good indicators to compare bull investments. This provides information on what the market would have to pay to justify paying more for a herd bull that

could produce a more market acceptable higher valued calf. The impact on the saved replacement heifers and bull selection is not addressed in this decision aid that focuses on weaning weight and percent weaned.

Input Data

The key data for this decision aid is the bull investment or purchase cost, estimated salvage value, and economic life. When combined with an interest cost on capital these are the "ownership costs" of the bull investment. Once the bull is purchased these are fixed costs and only vary with the salvage value of the bull and, of course, the productive life. Annual operating costs include the health-related expenses and annual BSE.

To calculate cost per cow, the number of cows serviced per year needs to be inputted. In order to evaluate the impact of number of cows and production cost per cow, a sensitivity table is included. Cost level is quite sensitive to the number of cows serviced and reinforces the importance of the breeding soundness exam, good bull nutrition, and management. To calculate change in weaned calf weight needed to pay for added costs, the weaned calf crop and weaning weight must be inputted. Weaned calf weight per female exposed is calculated. The final data item is the projected average market price of the weaned calves.

The usefulness of this tool is in its capability to quickly evaluate different variables. Or "what if analysis". Change the values in the **blue cells.**

Appendix A: Cost-Effective Health and Production Practices

The economics of health and production practices should be valued by determining if they are **"cost- effective"** rather than financially profitable for total ranch or cow-calf production activity.

Because of the cow-calf size structure and part-time nature very few cow-calf operations are truly financially profitable. Recall 82% of cow-calf operations have less than 50 cows, 96% have less than 200 cows (2012 Census). The average size herd in the US is 40 cows.

When encouraging use or promoting of practices rather than concern about measuring ranch or activity financial profitability it is important to evaluate if the practice is **"cost-effective"**. Being a cost-effective practice means the added cost will be offset by more revenue from improved cattle performance and reduces market discounts that will cover the added cost. Practices that save the cattle's lives or reduce long-term productivity are cost effective.

Correct implementation of health and production practices enhances the welfare of the cattle.

Most "program cattle" and branded beef production and marketing alternatives now have required health programs that must be followed to participate in these "value added" programs.

Doing the right thing on time is the objective and consideration of **cost effectiveness** is important in judging what to implement for all cow-calf operations irrespective of herd size.

As noted below it takes some extra data and effort to measure ranch or enterprise financial profit.

Financial profitability is measured by calculating the **net income, accrual adjusted** or accrual revenue and expenses reported in the business accrual adjusted income statement or profit or loss (P&L) statement. Breeding stock replacement cost is calculated using either the Farm Financial Standards Council (FFSC) base value or the Generally Accepted Accounting Principles (GAAP) full cost absorption method. Depreciation of capital assets is based on replacement cost. Owner operator labor and management compensation used is equivalent to hired compensation. Family living withdrawals beyond this level are equity withdrawals. Interest is the cash paid and change in accrued interest. Financial net income or profitability is for a fiscal year and does not include real estate appreciation. Net after tax profitability is financial profitability minus IRS income tax paid. One of the important measures of financial profitability is ranch return on assets (ROA).

Measuring cow-calf financial profitability is beyond "cash cost" so frequently published the beef cattle press as profit. Measuring of ranch financial profitability is not done by many ranches.

For more information see "Measuring Ranch Profit is Beyond Cash Reporting" that identifies many Land Grant University and other information sources. See Department of Agricultural Economics, Texas A&M University – Agri-Life Extension – Beef Cattle Decision Aids. http://agecoext.tamu.edu/resources/decisionaids/beef/ See "Measuring Cow-Calf Ranch Costs, Profit and Sustainability"

Appendix B. Finance and Economic Terminology

Total Cost and Total Unit Cost (TUC) includes: 1. Direct costs, 2. Indirect costs including general and administrative (G&A) and management costs including owner operating management compensation and 3. Finance cost. When costs are complete TUC is consistent with the total business income statement or profit and loss (P&L) statement.

A warning – seldom are the TUC published in the beef cattle press. Most frequently they only include cash cost leaving off depreciation and compensation to owner operator labor and management (see web site at end of sheet for decision aids using TUC.

Direct Costs are expense items that are directly related to production activity such as grazing and feed costs, health, processing and treatment.

Owner Operator Labor and Management is reflected in family living withdrawals is the cash paid for owner and labor and management services provided by the family. In cost calculations family living withdrawals should be at a level equivalent to the salary required to hire a non-family member to provide an equivalent service. Actual withdrawals in excess of this amount must be **considered capital distributions** in order to reconcile the retained earnings and statement of cash flows. This is not an IRS tax deductible cost for a sole proprietor filing using the Schedule F.

Financial Analysis focuses on determining the accounting cost (cash and non-cash), profitability or change in equity, and repayment capacity of the production activity or business being evaluated. Financial costs are those reported in the business accrual adjusted income statement.

Financial Costs include cash costs, depreciation, and non-cash accrual adjustments, such as accounts payable, accrued interest, etc. These costs are recorded and reported in the business accounting system. The financial cost does not include opportunity cost of resources like lease equivalent or owned land and interest on equity capital or estimated market value of retained calves.

Indirect Costs include ownership and operating cost of facilities. Depreciation, repair, maintenance, of the ranch vehicles, machinery and equipment, labor and management, utilities, property tax are examples of indirect operating costs. General and administrative costs are indirect cost. These costs go on irrespective of the number of cattle or head days resources are used.

Profitability is the ability of the ranch production and marketing activity to generate income in excess of total unit costs. Profit is the net addition to equity capital. A profitable business has equity growth reported in the income statement as net ranch accrual income and balance sheet equity as retained earnings and **change in equity**.