



Managing for Today's Cattle Market and Beyond

Integrated Management and Setting Goals

By
John P. Hewlett, University of Wyoming

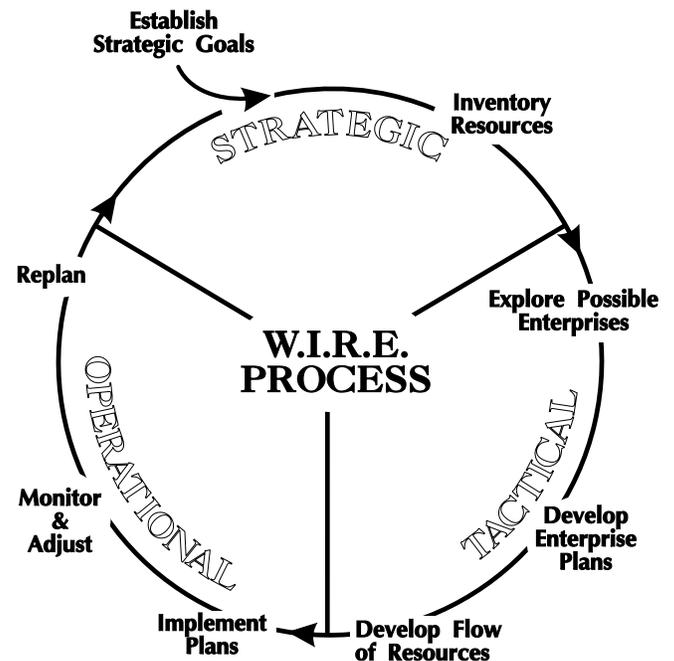
Managing a farm or ranch has never been easy, especially when commodity prices are down. Changing federal, state, and other regulations, coupled with new production technologies, improved communication methods, and more abundant information combine to lead many managers to ask "How do I even start to get a handle on it all?". This paper provides a brief look at a process for setting goals. Why bother with setting goals? I think the old adage says it best, "If you don't know where you're going, any road will get you there." When times are tough having clear, well-defined goals can help focus energy and effort. While this may not guarantee success, it does make it more likely. Doing the right things right is the key to getting to where you want to be.

A new way of approaching the many forces and factors facing farm and ranch managers is starting to spread across this country and elsewhere. This 'new' method can be referred to as integrated management. This so-called 'new' method is probably not so new to operators who have been around awhile. In fact, this method of approaching agricultural management problems is probably the same system used by operators years ago. While in the past an operator could afford to be intimately familiar with all the resources of his/her operation, today's operations are larger and regulations more numerous, making the job appear overwhelming, without some mechanism for approaching it.

Integrated management is a method of manag-

ing the farm or ranch operation as a whole, rather than as separate, unrelated enterprises. Some refer to this type of system as a method of 'holistic' thinking. No matter what the name, it provides a step-by-step method for working through the 'overload' of information ag managers must deal with on a daily basis.

The process of integrated management begins with setting goals for the operation.



These goals include both business and personal goals. It may even include the goals of both manage-

ment and personnel. Without goals, the farm or ranch is managed randomly. Yet few ag operators (let alone their employees) ever sit down and write out their goals. Goals can describe what the operation should be in 10-20 years, where management wants to be personally in 5 years, or the kind of education they'd like to provide for their children. These sorts of goal statements are required if the persons involved, or the business as a whole is to ever reach the desired destination.

One integrated management program being offered in the West is titled WIRE (Western Integrated Ranch/Farm Education). It was developed by a team of Wyoming extension agents and specialists. The course focus is on giving participants a way of getting a handle on the management of their farm, ranch, or related business. It covers each step of a management process and helps managers get started applying the process in their own situation.

Setting Goals

The process starts with goal setting because it is a mission-critical activity. Goals form the very 'heart' of the management process. Following the process outlined below for establishing goals will help you create written goal statements. In addition, it describes a way to assign costs to each goal. Knowing the goals and their associated costs, gives you a roadmap to success for your operation. Using these goals, you can measure progress toward your destination. In addition, you can determine if your goals are realistic by considering the resource-base you have to work with.

Goals should not be simply for your operation, however. Goal statements should be about personal dreams, ambitions and desires. Your goals should include way of life, hopes for family, and life mission. In addition, you should consider challenges, feelings of purpose, and fulfillment you get from life.

The first step in goal setting for the operation is to determine who is the management team. Is it mom, dad, daughter and her husband? Perhaps it's a mixture of parents, uncles, brothers, sisters, and spouses all joined together in a corporation. It may be just you and your spouse. The important thing is to determine just who is the management team for your operation.

- Who's the coach? Is it Dad, Mom, Grandad, or someone else?

- Who's the quarterback? Is the quarterback Dad, Mom, the ranch manager, an uncle, or someone else?
- Who are other team players? Are the players children, other family players, hired managers, or workers, parents, stockholders, or others? Are all who are actively involved in the operation really want to be?
- Are there any players on the bench who would like to be in the game? Are there other children, family members, hired managers/workers, parents, stockholders, or others who would like to be actively involved in the operation? Have you ever asked them if they want to be involved?

Once you've determined who's on the team, get them all involved in the process. While this can be done without involving everyone, it won't be nearly as effective without their involvement. If you have a family operation, include all family members. If you have hired help, include the hired help and their spouses. The thing to remember here is that if the members of your TEAM don't have ownership of the goals, they probably won't be working hard to help you reach them. When listing out who's on your management team roster, consider these questions:

Mission Statement

The next step in setting goals for your operation is to visualize where you want to be. You may be thinking 5-10 years down the road. Or you may be considering where you want to be next year. That's OK. The main thing is to form a picture of what you want the future to be like. Some experts claim that we can program our minds to help bring about the things we really want to achieve.

Here are a few things an operation can be/become:

- It could be the lowest cost producer in the county.
- It might become renowned region-wide for producing high-quality breeding stock.
- It may become an operation known for high-quality hay, or a source of reasonably priced live stock forage.
- The operation could become known for its quality hunting opportunities or recreational experiences.

Here are a few things an operation could do:

- It could provide money for your retirement.
- It should generate enough income for your fam

- ily to live modestly until your retirement.
- It may provide the type of lifestyle your family desires.
- It might give the kind of recreational experience potential customers are looking for.

You want to capture this vision of your operation in a mission statement. This should be a list of all the things you want the operation to be and all the things you want to do with the operation. What sorts of things do you see the operation doing?

Example:

The mission statement of the XXX ranch is to:

1. Market grass through the sale of livestock and wildlife products.
2. Market recreational experiences by utilizing the ranch resources and ambiance.
3. Manage all ranch resources in a profitable way, allowing all people involved to enjoy the ranching lifestyle.
4. Be good stewards of all ranch resources, leaving them in better condition than they were when received.
5. Keep all buildings, improvements, and livestock facilities updated and visually appealing.

A mission statement should be a statement of the purpose of the operation. It should describe what you see the operation becoming for you, your family, and for your management TEAM. A mission statement should specify what your operation will focus on in the long run.

Written mission statements help build strategic goals that work for the operation. A mission statement may be viewed as being the trunk of your farm/ranch tree. From the mission statement springs the support and direction for the entire operation. All the operation's goals come from the mission statement or vision for the operation.



Writing Strategic Goals

With a mission statement in hand, you are ready to write your strategic goals. These might best be viewed as the roadmap to follow to reach the destination you've set for the operation. Strategic goals are long term goals. They are specific steps for reaching the general goal(s) described in the mission statement.

Good goal statements should be SMART. That is, they must be a Specific statement of what is to be accomplished; they must be Measurable by some objective means; they must be Attainable; they must be Related to one another; and they must be Tractable over time. Setting SMART strategic goals will provide you the tools to manage your operation to achieve the higher goals in your mission statement.

SPECIFIC-goals should be definite, focused, and descriptive of the actions to take place. This part of the goal tells you *what* must be done in precise terms.

Example:

To generate enough income to allow us to maintain ownership of the operation.

MEASURABLE-goals should be easily measured. Such goal statements provide a benchmark against which to measure performance. This portion of the goal statement provides a means of knowing when the goal has been reached.

Example:

To generate a \$3,500/year principal payment, allowing us to maintain ownership of the operation.

ATTAINABLE-goals are within the reach of the operation. They can be accomplished and are realistic. Setting unrealistic goals for the operation is not helpful.

Example:

To generate a \$3,500/year principal payment, allowing us to maintain ownership of the operation.

This goal is realistic for the operation, if it usually yields a return greater than \$3,500 each year. However, if it provides only a few dollars of return over its expenses each year, this may be an *unattainable* goal.

RELATED-goals are connected or associated with

other goals set for the operation.

Example:

To generate a \$3,500/year principal payment, allowing us to maintain ownership of the operation.

This goal is related to other goals that move toward ownership. However, another goal might call for expansion. If this requires outside capital, it would reduce ownership of the assets pledged to the lender, making the two goals *unrelated*.

TRACTABLE-goals are manageable. These goals involve factors and resources that are controllable. They can be handled using existing resources.

Example:

To generate a \$3,500/year principal payment, allowing us to maintain ownership of the operation, while not requiring more time or new skills on the part of management.

This goal is tractable if the current management can handle the operations necessary to generate the dollars. However, if reaching this goal means that the manager would need to spend 5 out of 12 months a year monitoring stock reports, while trying to run an ag operation, it would not be a very *tractable* goal.

Where the mission statement is the destination, strategic goals form the roadmap. Strategic goals proceed from the operation's mission statement. They are supported by the mission statement and are nurtured by the principles it contains. They represent the specific steps the operation must accomplish to reach its final objective. To do this strategic goals must be prioritized. Resources available on most operations and businesses are limited. Thus, not all goals can be reached at the same time. Working on many or all goals at the same time is desirable. However, it may not be possible. Prioritizing your goals is a way of making sure the most important things are done first. If additional resources exist, they can be applied toward reaching less important goals.

The strategic goal worksheet provided is designed to help you draft strategic goals. To completely describe a strategic goal, a deadline for accomplishment must be set and resource demands calculated. A series of blanks is provided for this purpose. The worksheet also provides space for defining tactical and operational goals which are the steps for accomplishing the strategic goals.

Once strategic goals are written, make them vis-

ible. Hang a copy of your goals in a prominent place where they can be seen by all management TEAM members. The refrigerator in a family operation may be the ideal location. In a corporation, the main office may be the best place. Keeping your goals where the TEAM can see them often, helps everyone keep in mind what's important for the operation.

The next step in the management process is to develop a complete resource inventory. Completing this step will provide a list of all resources available on the farm/ranch—financial, livestock, wildlife, human, agronomic and natural resources. Once goal statements and an inventory of resources have been drafted, the strategic level of the process is accomplished. This work sets the direction for everything that comes after. The tactical level explores how to get from where you are to where you want to be. This includes all activities or enterprises that can turn farm/ranch resources into income. Such tactical planning is done within the resource limitations of the operation, including the human resource limitations of time and skill levels.

Within the operational level of the process, new or revised plans are implemented—put to work on the ground. This is where the “rubber-meets-the-road”. This is the “what is done” part of the process that accomplishes the goals set at the strategic level. While plans are being implemented, resource use must be monitored and adjusted as necessary. Replanning occurs throughout the year as resource use is monitored; it should also occur at year end. In this way the management process provides information on how resources performed over the year, including contributions toward goals.

Ag managers must process an ever increasing amount of information to be competitive in today's operating environment. In addition, the level of competition inside and outside our borders is increasing. To make sense of this and to manage in a way that allows success, a method of approaching the problem is needed. Integrated management—a means of looking at the resources available, analyzing alternative enterprise activities, and implementing plans to accomplish those activities in a resource-sustainable manner is one way to approach the problem. Success in this management system is measured by progress toward goals, both business and personal. It's been said that money alone can't buy happiness. When extra dollars of revenue help the manager reach strategic goals, progress alone can be very satisfying.

Strategic Goal Worksheet

Goal Statement:

The goal statement is the verbal description of the goal to be accomplished.

Strategic goals should have an associated deadline. This helps prioritize your goals.

Deadline for Goal Attainment:

_____ Goal Costs/ Resources Required: _____

<u>Basic Resources</u>	<u>Human Resources</u>	<u>Financial Resources</u>	<u>Livestock Resources</u>	<u>Wildlife Resources</u>

Resources needed to achieve this strategic goal should be briefly described/listed in this section.

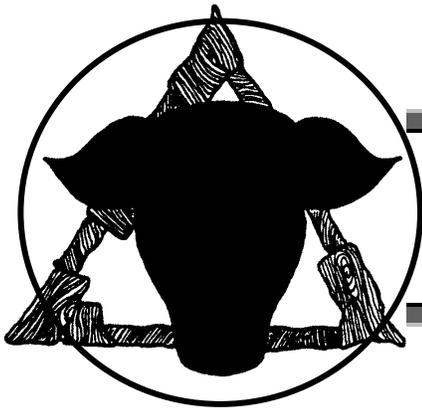
This will help in tactical planning for goal attainment.

Associated Tactical Goals:

Tactical and operational goals are the means we use to accomplish strategic goals.

Associated Operational Goals:

Briefly outline here the tactical and operational steps you see as necessary for reaching your strategic goal.



Managing for Today's Cattle Market and Beyond

March 2002

Taking Your Beef Cow Herd Profitably Through The Cattle Cycle

By

Harlan Hughes, North Dakota State University

Lee Meyer, University of Kentucky

Tim Cross, University of Tennessee

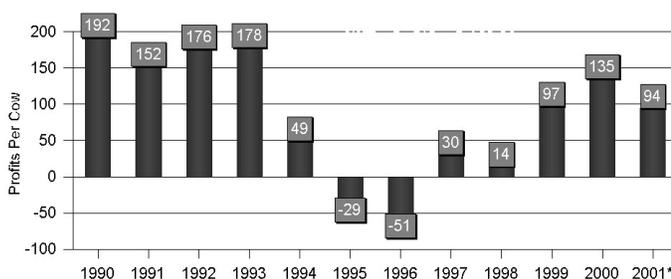
Dwight Aakre, North Dakota State University

Section I: Set Your Goals In The Good Times To Increase Economic Efficiency And To Build A Financial Reserve

Introduction

The key to surviving the cattle inventory cycle, and its resulting price cycle (cattle and beef), is to first increase the economic efficiency of your beef cowherd during the good times. Then, use this gained economic efficiency to build a financial reserve to take your beef farm or ranch through the next downturn in beef cattle prices with lower production costs.

**Figure 1. Beef Cow Profits: Net-Value-Added
(North Dakota Farm Business Management Herds)**



*Preliminary

We know that a typical cattle cycle lasts about 10 years. We also know that cattle inventory cycles are the fundamental factor behind cattle price cycles. Random shocks such as the 1995 record corn prices can influence the cyclical nature of the industry¹. The beef price cycles of the 1980's and 1990's shared much in common and future cattle cycles will likely have much in common with past cycles.

Lessons From The 1990s Cattle Cycles

Figure 1 shows the impact that the cattle cycle of the 1990s, and its related beef price cycle, had on profits in North Dakota's beef cowherds.² Based on the North Dakota data, beef cow operators started out the decade of the 1990s with high net income per cow. The 1990 through 1993 time period completed a record high 7-year beef cow net income period (1987-1993) driven by the same 7-year record-high price period. After the 7-year high, profits decreased for 3 consecutive years. The 74 percent decline in profit during 1994 certainly got the attention of cow-calf producers. After the 1994 drop, losses occurred in 1995 and even larger losses occurred in 1996.

Average beef cow profits finally turned upward in 1997, but could not be sustained in 1998. In 1999, profitability did increase again. Looking

ahead, average profits are projected to trend upward through 2003 and maybe even 2004. In the last cattle cycle, calf prices were strong for 7 years (1987-1993) before turning downward. The downturn was delayed by widespread droughts in 1988 and 1989, a 1992 severe snow storm in the Central Plains cattle feeding region and 1993 frosted food grains that became feed grains in the Northern U.S. and Canada.

It now appears that in 2000 and 2001 drought in major cow-calf states have changed the current cattle inventory cycle some. As the current beef price cycle continues, economically efficient beef cowherds should again experience several profitable years.

Table 1. Cow-Calf Producer Profitability (% Of Herds)

	1993	1994	1995
Profitable	72%	46%	21%
Near Breakeven	22%	39%	43%
Not Profitable	6%	15%	36%

Source: Cattle-Fax

Table 1 illustrates what happened to beef cow profits in the last downturn. In the 1993 record feeder calf price year, 72 percent of the CattleFax herds were profitable. Profits decreased in 1995 to the point that only 21 percent of all CattleFax herds were profitable. The actual price bottom year was in 1996 and is not included in Table 1. We are projecting that less than 15 percent of all beef cowherds were profitable in 1996.

The Northern Plains Integrated Resource Management (IRM) Cooperator Database indicates that during the last decade profits dropped the fastest in the high-cost herds; therefore, the take-home message here is that the herds that best survived the last downturn were those herds with high economic efficiencies. Current projections suggest a similar dismal economic performance for herds with low economic efficiencies going into the second half of this decade.

We are writing this fact sheet to encourage beef farmers and ranchers to utilize current beef cow profits to carefully invest in management tools and techniques that improve economic efficiency. Then, they should use this economic efficiency to build a financial reserve to be utilized in the next price downturn. These recommend management tools and techniques are described in this publication, and five

other Fact Sheets in the series entitled: 1) *Determining Your Unit Costs Of Producing a Hundred weight Of Calf*, 2) *Conducting A Comparative Analysis Of Your Herd's Production Facts With Other Herds' Production Facts*, 3) *Benchmarking Your Herds Economic Facts*; 4) *Understanding Your Financial Situation*; and 5) *Applying The Assessment Tools To Your Farm/Ranch*.

The Beginning Of the Expansion Phase Is A Key Time To Increase Economic Efficiency

Whether calf prices are high or low, improvements in economic efficiency can lead to improved profits. When improvements in economic efficiency require additional investments, the start of the expansion phase of the cattle cycle can be a good time for a beef farmers and ranchers to become proactive and to implement an action plan for “taking advantage of the cattle cycle.” Since more capital is usually available, managers can use the early expansion phase of the cattle cycle to increase economic efficiency.

Unfortunately, many producers allow economic efficiencies to decline during the good times. Then, when prices again turn downward, these same beef cow producers typically do not have sufficient time to increase economic efficiency. As a result, financial stress tends to hit them hard during the tough times of the cattle cycle.

To illustrate the potential for improved economic efficiency, consider again the North Dakota IRM database. In 1999 all of the participating Northern Plains IRM Cooperators were operating highly tuned beef cow businesses.³ Approximately one-half of these cooperators had been specifically working on their economic efficiencies for five plus years. For 1999, these experienced IRM Cooperators generated the lowest average annual calf production costs of any year in the Northern Plains IRM Cooperator databank. These low unit costs were the direct result of high economic efficiencies. Even so, thirty-three percent of these IRM herds had considerable room for improving their economic efficiencies if the average of the low-cost one-third of these 1999 Northern Plains IRM Herds⁴ was used as the benchmark.

When ranked by the unit cost of producing a hundredweight of calf, the low-cost one-third of these experienced Northern Plains IRM Herds netted \$145 profit per cow with their 1999 calves. This is

\$84 more than the high-cost one-third of the herds who averaged only \$61 profit per cow demonstrating that economic efficiency does make a difference in the high priced years -- even on intensively managed herds.

The key to taking advantage of the “up cattle market” is to remember that beef prices go in cycles. Beef prices will once again cycle downward. Current management energies should be directed towards executing a specific management action plan designed to increase economic efficiencies and to build financial reserves to be used when the tough times return. Without a specific action plan, some beef farmers and ranchers will not build a financial reserve and may not have sufficient financial resources to take them through the next price lows.

Recommended Special Management Actions

The very first management action that beef farmers or ranchers should take, in maximizing economic efficiency and in building a financial reserve, is to *assess* his herd’s current economic efficiency. Section II in this fact sheet presents three recommended herd business management tools, and Section III in this fact sheet presents three recommended total business financial assessment tools. Sections II and III are both designed to provide “green-flag and red-flag” benchmarks on economic efficiencies of beef cow herds and total farm or ranch businesses.

Section II: Three Beef Cow Herd Business Management Tools

There are three “green-flag/red-flag” herd business management tools that producers should consider as they take their beef cows through the 10-year cattle cycle. The first recommended herd business management tool is the *net cash flow account* specifically designed for the beef cow profit center. The two other recommended herd business management tools are the *net-value-added account* and the *net-financial-returns account* both also specifically designed for the beef cow profit center. The bottom lines from these three business management tools become that herd’s key economic benchmarks.

These three key herd economic benchmarks need to be established during the good times of the beef price cycle so that benchmark trends are in place before the cyclical downturn. Deviations from

the benchmark trends can then be used as early warning “red-flag” business signals as prices cycle downward. Our past IRM experiences suggest that beef farmers or ranchers that recognize their beef cow herds’ “red-flags” early best survive the cattle cycle’s beef price downturn.

1. Net-Cash-Flow Account

The annual *net-cash-flow account* is based on the direct cash costs of the cowherd including growing farm-raised feed and forage for the cows⁵, servicing debt (interest and principal payments) and drawing family living from the beef cow herd profit center. Depreciation on cows and equipment are not cash costs and are not considered in the cash flow analysis.

Net-cash-flow is the business’ bottom-line benchmark and is used to answer the question: “Are my beef cows generating a positive cash flow or are my beef cows being subsidized by other sources of cash flow?” If the beef cows are generating a positive net-cash-flow, the benchmark is a “green-flag” and if the beef cows are generating a negative net-cash-flow it is a “red-flag.” A multi-year original net-cash-flow benchmark trend should be established during the expansion phase of the cattle cycle.

2. Net-Value-Added Account

The net-value-added account is based on farm-raised feed and farm raised hays priced to the beef cows at fair market value (opportunity costs), assets valued at market value, actual interest paid on borrowed money and non-cash depreciation. Principal payments and family living draw, on the other hand, are not part of economic costs. Net-value-added and net-cash-flow are two distinctly different business management tools.

Net-value-added is the business’ bottom-line benchmark used to answer the question: “How much added economic value did my family generate by running the beef cow herd?” Net-value-added is the dollar net returns that the farm or ranch family earned from their unpaid family and operator labor, management, and the family’s equity capital” contributed to the beef cow profit center. These are the three, and the only three, family resources contributed to the beef cow profit center by the farm or ranch family.

Positive net-value-added benchmark profits reflects the magnitude of the family’s earned net income for its unpaid family and operator labor,

management and equity capital. Negative economic net-value-added benchmark, on the other hand, implies that the family received no economic payment for its three resources contributed and, in fact, the beef cows did not even pay market price for farm-raised feeds.

In general, a beef farmer or rancher does not need to add value to the family's resources consumed by the beef cows each and every year; however, a negative net-value-added benchmark in any one year, does send up a "red flag" that needs management's attention. Repeated years of negative net-value-added benchmarks from the beef cow profit center, has the potential to put the total beef farm or ranch business into financial jeopardy.

3. *Net-Financial-Return Account*

The third herd business management tool is the net-financial-return account based on assets valued at book value (costs minus depreciation taken to-date), costs of producing farm-raised feeds, cost of pastures grazed, and actual interest paid on money borrowed for capital assets. Land is valued at actual acquisition cost and not at current market value or opportunity cost. If the land is paid for, there is no land cost.⁶

The net-financial-return is the bottom-line benchmark used to answer the question: "Are my beef cows adding equity to my family business or are my cows consuming family equity?" A negative net-financial-return is a "red-flag" implying that equity capital is being consumed. This is serious and must be immediately turned around or the total business may quickly fail.

What We Learned From "Green-Flag/Red-Flag" Herd Assessments In The Last Cattle Cycle

North Dakota generated herd assessments for IRM Cooperators' for one complete cattle cycle (1990's). Let's review what was learned from this decade of "green-flag/red-flag" herd assessments.

When beef prices were high, the typical beef cow business generated a positive net-cash-flow, a positive net-value-added and a positive net-financial-return. During the good times, all herd assessment benchmarks for typical beef cowherds were sending "green-flags" signals.

As the beef price cycle turned downward in the mid part of the decade, a distinct order of red flags started showing up. In the first year of the downturn (1994) we saw some herds, but not all herds, generate net-cash-flow "red-flag" signals. Typically,

the other two business benchmarks were positive and sent "green-flag" signals. We now know that the early net-cash-flow "red-flags" were a signal of more financial problems to come.

As beef prices continued to go lower in the next year (1995), we started getting "red-flag" signals from the net-value-added herd assessment. The net-financial-return benchmark benchmarks, however, were typically still positive. As beef prices continued to go lower in the third year (1996), the net-financial-return benchmarks, on some herds, turned negative and sent "red-flag" signals. This third indicator implied that these ranchers were consuming equity capital and that long-term survival for these operations was in jeopardy.

It is significant to note the order that the "red-flags" appeared in this downturn. The first "red-flag" to pop up was negative net-cash-flow, the second "red-flag" was negative net-value-added economic returns, and the third "red-flag" was negative net-financial-returns. The net-cash-flow "red-flag" was typically received two to three years before the long-term survival of the business came into jeopardy. The key to the financial performance of these businesses was early detection and managements' immediate corrective actions.

Astute managers responded to the early "red-flags" and took corrective management action before the businesses deteriorated any more. Others, without these red-flag benchmarks, waited for their banker to detect financial stress. By the time that their banker raised the question with the herd manager, it was typically too late. A beef cow manager needs to read the "red-flags" earlier than does his banker. Bankers' responsibilities to depositors are to protect their loan security rather than to ensure the financial health of the farm or ranch business. A manager that waits for his banker to raise the first "red-flag" signal is asking for financial trouble.

When beef prices started back up in the 1997 to 2000 time period, the next net-financial-return flag turned green first, the net-value-added flag turned green second and the net-cash-flow flag turned green last. Without a financial reserve, some herds had 3 years of negative net-cash-flow and a few had up to 5 years. Typically, three years of negative net-cash-flow will substantially weaken the financial structure of beef or ranch business. We can almost guarantee that 5 years of negative net-cash-flow will ensure that beef cowherd will not make it

through the next cattle cycle. Once stressed, a business may never recover.⁷

Conclusion

Ten years of herd assessments suggest that every beef farmer and rancher needs to cash flow each and every year. Clearly, if they do not cash flow, they will be talking to their banker about some changes. They may even be faced with liquidation of assets.

A beef cow herd, on-the-other-hand, does not need to add value to the family's resources each and every year; however, negative net-value-added benchmarks in any one year does send up a "red-flag" that needs management attention. Negative net-value-added benchmarks over multiple years have the potential to snowball into a major total business problem.

A negative net-financial-return benchmark in any one-year implies that equity capital is being consumed. This is serious and must be immediately turned around quickly or the financial survival of the total business is in jeopardy.

Section III: Three Total Business Indicators

While the previous sections of this fact sheet series focused primarily on assessing the beef cow profit center, there are also three "Green-Flag/Red-Flag" total business indicators that should be used as financial benchmarks for the overall beef farm or ranch business. The three recommended total business benchmarks – liquidity, solvency, and cost structure and profitability – are each discussed in detail below. These three total business assessment tools are an absolute must for beef farmers or ranchers who are going to build financial reserves.

These total business assessment tools are designed to help beef farmers and ranchers do an evaluation of the financial performance of the total farm or ranch business. Beef farmers and ranchers are encouraged to take their existing *financial statements* that they are going to provide their bankers and use Table 2 in this fact sheet to perform their own total farm or ranch business assessments. We recommend doing these self-assessments and developing alternative operating plans before visiting your banker.

1. Liquidity (also known as cash flow)

Liquidity refers to an operation's ability to meet cash expenses and cash payments as they occur and

to provide for unexpected events. Cash expenses and payments include items which will be paid within a given time period (usually the next 12 months).

Two measures are commonly used to analyze liquidity. The first is *current ratio* and the second is *net-cash-flow* of the total business. You can calculate a current ratio by dividing the value of your total current assets by your total current liabilities. Current assets are those items you own which are easily converted to cash with low transactions costs (e.g., raised livestock, checking accounts, C.D.'s, accounts receivable within a year, etc.). Current liabilities include scheduled payments on loans, accounts payable, and other obligations due within a year.

A large current ratio is desired and should be experienced during the good times. Current ratios greater than 2.0 suggest that opportunities for additional business investment may be feasible; however, *buying additional beef cows during the expansion phase of the cattle cycle is not recommended*. During the period of high bred cow prices, we recommend investing, instead, in management tools and technologies that enhance economic efficiencies. We think beef farmers and ranchers should have been expanding their cow herds when breeding cow prices were relatively low rather than expanding their herds during times of high bred cow prices. *Buying breeding cows when prices are high generally makes that herd a high-cost herd*.

A current ratio between 1.0 and 2.0 suggests that caution be exercised in managing cash and no herd expansion should be considered. A current ratio less than 1.0 indicates potential liquidity problems that may only be solved by liquidating some breeding cows or other assets.

Another useful measure of liquidity is *projected annual net-cash-flow* of the total business, calculated as projected annual cash inflows minus projected annual cash outflows. This measure encompasses all expected sources-and-uses of cash over the next twelve months, and can be used to anticipate liquidity problems before they occur. A monthly cash flow projection can also be prepared to monitor sources-and-use of cash month by month. This monthly cash flow projection can also be used to project borrowed capital needs and repayment ability by the month. It is generally easier to prevent a cash flow problem before it happens rather than to correct a cash flow problem after it occurs.

A decrease in cattle prices can quickly lead to liquidity problems for many beef farmer and ranch operators. It is useful to test a situation with lower-than-projected prices as a way of preparing for the unexpected. Not meeting short-term cash obligations can seriously jeopardize a producer's financial survival. Creditors may refuse to extend credit to an operation that cannot keep its bills current, suppliers may refuse to deliver products to farms with past-due accounts, and lack of cash for living expenses can quickly lead to family stress.

A small negative or small positive net-cash-flow should be interpreted as a “red-flag” warning that margins are small. Management changes that produce incremental increases in revenues and/or cost savings may be needed to provide additional cash flow.

A projected large negative net-cash-flow value is an indication of serious liquidity problems. Overcoming this cash shortfall may require additional borrowing, sales of assets, or postponement of scheduled payments.

Beef cow producers have one typical advantage over other types for farmers. They can normally sell off breeding cows to generate cash when needed.⁸ Most breeding stock sales, however, entail significant income reductions in following years and often lead to under utilized resources in future years which, in turn, leads to reduced economic efficiency of the beef cowherd, that is, just the opposite of what is desired.

2. Solvency

While liquidity is concerned with the short-run ability of a farm or ranch to meet its cash flow obligations, solvency examines its long-run financial stability. If the farm or ranch were sold today, would the total value of the assets retire all the outstanding farm debt? This is the primary question that a solvency measure should answer. An answer “no” to this solvency question sends a “red-flag” and needs management’s immediate attention.

One measure of solvency is the debt-to-asset ratio. This is calculated as the total outstanding debt on the farm or ranch divided by the total value of all farm or ranch assets times 100. Solvency estimates the percentage of the farm or ranch assets that are debt-financed. For example, an operation with a debt of \$150,000 and assets valued at \$225,000 would have a debt- to-asset ratio of 67% ($\$150,000 \div \$225,000$), and would be at considerable financial

risk. An operation with the same debt but with \$450,000 of assets would have a debt-to-asset ratio of 33%. Both operations are solvent because debt is less than the asset value, but financial risk is greatly different between the two farms.

A lower debt-to-asset ratio indicates greater solvency and a greater ability to withstand short-term operating losses. Ratios less than 40 percent show reasonably good potential for long-run financial health. Debt-to-asset ratios from 40 to 60 percent are acceptable but the business is at some risk. Debt-to-asset ratios above 60 percent suggest that serious attention is required during periods of low prices.

Research suggests that beef cow operations are more sensitive to debt than other types of farming and beef cow operations cannot support as much debt because of the cattle cycle. As a result, debt loads should be closely monitored to insure that progress is being made toward reducing the debt-to-asset ratio over time.⁹ Ratios above 40 percent send up “red-flags” in beef cow operations.

Net worth is another good measure of solvency. Calculated as total assets minus total liabilities, it shows the owner’s equity capital in the farm or ranch. Farms with small net worth values are less able to withstand financial losses compared to similar farms with large net worth values. Net worth is increased by 1) generating profits, 2) asset values appreciating over time and 3) retiring debts.

A related solvency measure is the year-to-year change in net worth. This measure is calculated by subtracting last year’s value of net worth from this year’s value of net worth. A large negative change in net worth from one year to the next is a “red-flag” signal that all is not well on the farm and the value of the owner’s equity capital is declining. A large negative change in net worth is serious and needs immediate attention.

Solvency problems may not manifest themselves as quickly as liquidity problems, but their consequences can be more serious. In fact, liquidity problems can easily progress into solvency problems, especially when intermediate assets (cows) and long-term assets (land) are liquidated to cover current liabilities.

3. Cost Structure And Profitability

Profit in the beef cow herd is determined by a basic profit equation composed of three critical components. The basis profit equation is:

$$\text{Profit} = \text{cwts (Price - UCOP)}$$

Where: **cwts** is the hundredweights of calves produced; **Price** is the price received for calves sold; and **UCOP** is the unit cost of producing a hundred weight of calf. The first profit (**cwts**) component is production oriented and the other two components (**Price and UCOP**) are economic oriented.

For some producers, the cattle enterprise is just not profitable. Even with high beef productivity (high cwts), it may still not be profitable. High beef production is important but does not guarantee high profits. Low unit cost of production, along with high production, is also required to ensure profits. High unit cost herds, on-the-other-hand, are at risk of generating economic losses and can not be sustained over time. High cost herds can even drag the rest of the total farm or ranch business down. Unit cost of producing a hundredweight of calf (UCOP) plays a major role in determining overall profits from the cowherd and the total farm or ranch business.

You absolutely have to know if you are operating a high cost or low cost beef cow herd. Your ability to cope with the next down market will depend on your herd's unit cost of producing a hundredweight of calf. If you are a high cost producer, use the current good times to lower your

unit cost of producing a hundred pounds of calf. If you are already a low cost producer, don't change.

Another fact sheet in this series specifically guides you through a cost of production analysis of your beef cow herd. A third fact sheet helps you benchmark your herd so that you can determine if you are operating a high-cost or low-cost herd.

4. Putting It All Together

An examination of the problem indicators from your beef farm or ranch business can help you focus your limited management time on the right things in these good times (see Table 2). First, evaluate each problem area in your business by circling the appropriate evaluation answer. Then, look at each problem area where you've circled "not a problem," pat yourself on the back and try to capitalize on these strengths. Make sure that your future management plans take advantage of these strengths when prices again turn downward.

As a second step, examine the serious problem column. Any "serious problem" circled should be addressed immediately. Next, examine the "caution" items circled. These are items that have room for improvement, and, if addressed, should improve your long-run business performance and long-run business financial survival.

Table 2: Problem Indicator Summary

Problem Area	Measures	Not A Problem	Caution	Serious Problem
Liquidity	Current Ration	>2.0	1.0 - 2.0	< 1.0
	Net-cash-flow	Large Positive	Small	Large Negative
Solvency	Debt-to-asset Ratio	< 40%	40% - 60%	> 60%
	Net Worth	Large	Moderate	Small
	Change in Net Worth	Positive	Small	Large Negative
Unit Costs of Production	Cost Per Cwt Of Calf Produced	< \$62	\$75 - \$80	>\$80

You now know if liquidity, solvency, or unit costs of production are "red-flags" for your herd. How quickly these red flags will show up in your beef cow business during the downturn phase of the cattle cycle depends on (1) the economic efficiency of your operation, (2) your cost control program, and (3) the debt structure associated with your beef cow herd. When prices are good, you have an opportunity to formulate a management action plan now to prevent future "red-flags" from showing up during the next downturn.

Summary

Beef farmers or ranchers who are serious about increasing economic efficiency and building a financial reserve, should first replace perceptions about the business with business facts. This is done by collecting and analyzing the "facts" on the business. When a beef farmer or rancher collects and analyzes his own business facts, perceptions will be left behind and reality will be the focus. The second step in increasing economic efficiency and building a

financial reserve is being receptive to making modifications to the business during the good times.

Section I of this fact sheet laid out the cattle cycle's impact on beef cow profits and projects a profit pattern for the rest of this decade. Beef farmers and ranchers are encouraged to increase economic efficiency and to build a financial reserve. Section II of this fact sheet described three recommended herd business management tools specifically identified for increasing a beef cow herd's economic efficiency. Section III focused on three total business management tools recommended for the total beef farm or ranch business.

Your state Cooperative Extension Service, state IRM Team, and your own local Learning Team¹⁰ can help with the collection and analysis the herd's production and economic facts. Beef farmers and ranchers should then use the services of these same professionals to help increase economic efficiency and to build a financial reserve in anticipation of the next tough times.

¹ For a more detailed discussion on cattle cycles are available including other articles in this series and <http://www.ag.ndsu.nodak.edu/cow/new/dvmpt1.pdf> and

<http://www.ag.ndsu.nodak.edu/cow/new/dvmpt2.pdf>.

² Data source: North Dakota's Farm Business Management Summaries published by North Dakota State University.

³ In 1999 all IRM herds analyzed were former IRM Cooperators with 1 to 7 years of IRM Experience. No new Cooperators were accepted in 1999.

⁴ Year 2000 data is not yet available.

⁵ The cash costs of growing farm-raised feeds fed to the beef cows are taken into account in the cash flow business management tool. (This is different than on the net-value-added side of the business). If the cow consumes the feed harvested from an acre, it is assumed that the beef cow has to pay the cash costs of producing that acre of feed including any debt service (interest and principal) associated with that acre.

⁶ General Accepted Accounting Practices (GAAP) is used to generate the net-financial- return account for the beef farm or ranch.

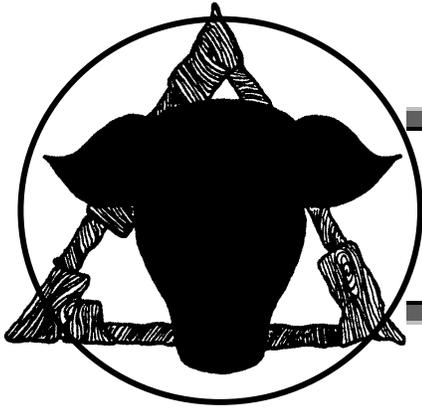
⁷ Some simulation work suggests that when debt service is too high on a beef cow operation, that it goes bankrupt in the second cattle cycle. It appears that a high debt service ranch will make it through the first cyclical downturn because expenses can be

postponed until prices come back up. All the income generated in the next good time is used to pay past bills. Then, when the next cyclical downturn comes, there are no financial reserves to get them through that 2nd downturn.

⁸ It is the collective sell off of breeding females in times of low prices and severe cash flow that typically causes the cattle cycle numbers to turn downward. The cattle number turn-down is triggered by selling breeding animals for cash, which, at first, amplifies the price downturn, but later, facilitates the price upturn in beef prices. Now as prices are going up, these same producers are holding back more heifer calves rather than selling them for the higher calf prices. This is what causes cattle cycles.

⁹ North Dakota's simulation research on beef operations in the 1980s tended to lose all equity through the second beef price cycle if the initial debt-to-asset ratio was above 40 percent. This suggested, at least to us, that beef operations might be more sensitive to debt-to-asset ratios than other type of commercial agricultural businesses.

¹⁰ To learn more about the Learning Teams, see another fact sheet in this series entitled "IRM Learning Teams."



Managing for Today's Cattle Market and Beyond

March 2002

Determining Your Economic Unit Cost of Producing A Hundred Weight of Calf

By

*Harlan Hughes, North Dakota State University
Dwight Aakre, North Dakota State University*

Introduction

Beef cow producers have traditionally focused their beef cow management attention on the physical production traits of their herds. Weaning weights have typically been the primary focus of many beef cow producers. Economic analyses have confirmed that high production is important but does not guarantee high profits.

Astute beef cow producers are starting to recognize that more than just weaning weights are determining beef cows profits. In today's economic environment, managers of high-profit herds are also focusing considerable management attention on the economic traits of their beef cow businesses. High production levels, when coupled with low unit costs of production, are sure recipe for running a high-profit beef cowherd.

The Profit Equation

Profit in the beef cowherd is determined by a basic profit equation composed of three critical components. These three critical components are hundredweights (Cwts) of calf produced, price received for calves sold (Price), and the unit cost of producing a hundred weight of calf (UCOP). The basic profit equation is:

$$\text{Profit} = \text{Cwts (Price - UCOP)}$$

The first profit component (Cwts) is production oriented and the other two components are economics oriented.

Unit cost of producing a hundredweight of calf (UCOP) plays a major role in determining overall profits from the beef cowherd. This fact sheet focuses on UCOP by laying out a step-by-step procedure a beef cow producer can follow. Beef cow producers are encouraged to follow these steps in calculating his herd's unit cost of producing a hundredweight of calf.

Unit Costs of Production

Statistical analysis of North Dakota's 1994 Integrated Resource Management (IRM) Cooperator herds suggests that only 20 percent of the herd-to-herd variation in profits can be explained by weaning weights.¹ This, in turn, suggests that 80 percent of the herd to herd variation in profits has to be attributed to something other than weaning weights. This 1994 statistical analysis also suggested that cost of production goes a long way towards explaining the remaining 80 percent of the herd-to-herd variation in profits.

Further analysis suggests that unit cost of producing a hundredweight of calf, rather than costs of production per cow, plays a major role in determining beef cow profits. As we go through the

next cattle cycle, beef farmers and ranchers need to expand their management attention beyond weaning weights to also include their herd's unit cost of producing a hundred weight of calf.

Why do we favor unit cost of production over cost of production per cow? Cost per cow has very little management power because it does not reflect the herd's productivity. Unit cost of producing hundredweight of calf, on-the-other-hand is a ratio of the herd's total costs of production in the numerator and the herd's total pounds of calf produced in the denominator. It takes both costs and production into account.

UCOP is an index of total costs divided by total units of production. Both production efficiency and economic efficiency are measured simultaneously by UCOP. Unit cost of production (UCOP) gets its analytical power from the fact that all production costs and all units of physical production are taken into account simultaneously.

Beef farmers and ranchers are encouraged to take advantage of today's high cattle prices by building a financial reserve. The first step in building a financial reserve during the current "up market" is for beef farmers and ranchers to calculate their herd's UCOP. The second step is to compare the herd's UCOP to a set of benchmark herds' average UCOP to find out if the herd is a low cost or high cost herd.

A high-cost producer's third step for building a financial reserve is to lower UCOP. Increasing the herd's production efficiency and/or economic efficiency can do this. On-the-other-hand, the third step for a low-cost producer is to ensure that he remains a low-cost producer even during times of high prices. A rancher's economic survival during the next down-turn in the cattle prices may well depend on his being a low-cost producer during today's good times and on his building a financial reserve to take him through the next cattle cycle's tough times.

Divide Your Business Into Profit Centers

Rather than treating a farm or ranch business as one total business, it is recommended that a beef farmer or rancher divide his total farm or ranch business into profit centers and then treat each profit center as a stand-alone business. The key to enhancing overall business profits is to make each profit center stand on its own with its own profit or

loss statement. Then, expand the profitable profit centers and reduce or get rid of the loss generating profit centers generating.

A typical beef farm or ranch can be divided into a beef cow profit center, a backgrounding profit center, a forage profit center, a pasture profit center and a cash grain profit center. The beef cow profit center goes from conception to weaning. The backgrounding profit center goes from weaning until sold as feeders or transferred to a retained ownership profit center. The beef cow profit center and backgrounding profit center are two different profit centers even though most beef farmers or ranchers treat both as one profit center.

The market value of the weaned calves is credited to the beef cowherd and entered as a cost to the backgrounding profit center. The key question that we want every beef farmer or rancher to answer is "Did I make my profit pre-weaning or post weaning?" It is absolutely critical that you know the answer to this question. Pre-weaning profit is generated from the beef cows and the post-weaning profit is generated from the backgrounding and/or retained ownership.

Pasture is also treated as a stand-alone profit center. Pasture grazing should be priced to the beef cow profit center at the going local pasture rental rate; then, the pasture profit center should be credited with the same local pasture rent as income. By comparing your pasture income to your pasture costs, you will know if you are making any profit operating the pasture profit center.

Home grown forages fed to the beef cows should be priced into the beef cow profit center at the going market price (opportunity costs) and then credit your forage profit center with the market value of the forage fed. Now you can determine if you are making any profit raising forages.²

Once you have several years of profit or loss statements for each profit center, you will have a good feel for the enterprise changes that will increase overall profits and for the enterprise changes that will reduce losses in your beef farm or ranch business.

Calculating the Beef Herd's Costs of Production

The worksheet at the end of this fact sheet was designed to assist beef cow producers in analyzing the beef cow profit center. The objective of this fact

sheet is to assist beef cow producers in determining their unit costs of producing a hundredweight of calf.

In order to keep the data input to a minimum, a worksheet has been designed just for the beef cow profit center. Producers are encouraged to complete this worksheet using their last year's production and economics figures. The following discussion corresponds directly with each section on the accompanying worksheet.

In no way is this simplified manual worksheet designed to be replacement for the more comprehensive IRM-SPA³ or IRM-FARMS⁴ computerized analyses. It is hoped that this simplified worksheet will motivate producers to utilize the more in-depth computerized analyses available from IRM-SPA and IRM-FARMS.

Section 1: Production Profile

The National Integrated Resource Management Standardized Performance Analysis (IRM- SPA) Guideline suggests that reproductive performance of a beef cow herd needs to be based on females exposed to the bulls. The percent calf crop (Item I, Section 1) is based on the females exposed (Item C, Section 1).⁵ The IRM-SPA Guideline for calculating females exposed allows producers to subtract out those females that were tagged as culls before bull turnout. In addition, producers are to add in any bred females purchased or subtract out any bred/exposed females sold.

Producers should not subtract out cows that died, cows culled because of poor performance or cows culled because they are open. Producers also should not subtract out cows culled because of lightweight calves. This final number is referred to as *SPA Adjusted Females Exposed* that is a primary number used in calculating reproductive performance of a beef cowherd.

Section 2: Gross Income

A beef cow profit center generates both cash and non-cash income, both of which have to be taken into account when preparing an economic analysis of the beef cow profit center. The cash income is most readily identifiable as it related to the cash generated at sale time. Calf sales, Items 1 & 2, Section 2, reflect the cash income generated from calf sales. If you did not actually sell the calves, value the steers and all heifers not held back for breeding as if they had actually been sold at weaning. The beef cow profit center goes from

conception through weaning. Backgrounding and/or retained ownership are different profit centers.

Economic value of the cull cows is the capital gains. A capital gain is the difference between the book value (purchase price minus depreciation taken to date) and the selling value of the cull cow.⁶ Capital gains can be positive or negative.

Cull bulls are also accounted for through capital gains and not cash income. The capital gains of all bulls sold are the difference between the book value (purchase price minus depreciation taken to date) and the cash value when sol. Again, capital gains can be positive or negative.

The final component of the beef cow profit center's accrual adjusted income is inventory change. You must first calculate a beginning inventory value for the beef cow herd along with an ending inventory. Inventory change is calculated by subtracting beginning inventory from the ending inventory. Remember that inventory change can be positive or negative.

Adding up the six components of income generates the accrual-adjusted income for the beef cow profit center.

Since a beef cow profit center generates joint products -- steer calves, heifer calves, cull cows, cull open heifers, cull bulls and inventory change -- calculating costs per hundred weight of calves produced is difficult, at best. The authors' recommended procedure for handling this "joint product" problem is to convert all income from the six different products into the equivalent hundred weights of income from steer calves (Item 9, Section 2)⁷ here after referred to as hundredweights of steer equivalents.

Taking the combined gross income from all six products (Item 8, Section 2) and dividing it by the price of steer calves (found in line 1, Section 2) calculates the hundredweight of steer equivalents. For example, if the total income is \$500 per cow and the price of steer calves is \$98, then this \$500 income is equivalent to the income from 5.10 hundred weights of steer calves. Unit cost of production (UCOP) is then calculated with the 5.10 hundredweights of steer equivalents. This UCOP can be compared directly to the market price of steer calves.

Section 3: Feed Cost

The National IRM-SPA Guideline published by NCBA suggests that an economic analysis of a

beef cow profit center should value farm raised feeds fed at fair market value (opportunity costs). This suggests that if your neighbor would have paid \$50 a ton for the hay fed to your cows, than your own cows should also pay \$50 for that hay.

Pasture land is to be charged to your beef cows at the going rental rates. This means that both deeded pasture land and rented pasture land should be charged in at rental rates. Public land should be priced in at actual cash cost. Aftermath grazing costs, if any, should also be included and is typically expressed on cost per cow-day basis.

Total feed costs per hundred weight of calf sold is calculated by taking the total feed costs per cow (Item 16a) and dividing by the hundredweights of steer equivalents (Item 9).

Section 4: Livestock Costs

The only expenses that should be charged to the beef cow profit center are those expenses directly associated with the operation of the beef cow profit center (e.g., feeding, checking pastures, pumping water, veterinarian, etc.). It must be remembered, however, *that when farm raised feeds are priced to the beef cows at fair market value, farming machinery, equipment and production expenses for farm raised feeds (e.g., fuel, repairs, maintenance) can not also be charged to the beef profit center.* It is very easy to double account.

The cost of growing and breeding replacement heifers covers from weaning a heifer calf until a pregnancy-checked heifer is transferred into the main cowherd. The market value of the weaned heifer calf is not directly included in this analysis because heifer calves held back for replacements also were not valued in the gross income (Section 2).⁸ Heifer growing-costs are prorated out to all cows in the herd by taking the heifers' growing-cost times the replacement rate of the herd. If it costs \$300 to grow the replacement heifer and your replacement rate is 15 percent, this procedure prorates out a heifer replacement cost of \$45 per cow ($0.15 \times \300).

Interest on borrowed capital should cover interest paid on the breeding herd debt, building debt used by beef cows, and equipment debt used by the beef cows. Interest should not include farmland debt or farming machinery debt. Pasture land debt interest is separated out and put on its own line in Section 4 to emphasize that, *if pasture is charged at the going rental rate, then pasture debt interest is also not part*

of the economic costs of the beef cow herd (see Item 25).

The bottom of the Livestock Costs section (Section 4) is used to present a *direct cost summary* of feed costs plus livestock costs.⁹

Section 5: Overhead Costs

Overhead costs are those asset costs directly associated with the breeding herd. A common error that beef farmers and ranchers tend to commit, when dealing with the profit center concept, is that they want to charge all of their farming overhead costs (including machinery investment) to the beef cow profit center. Charging farming costs to the beef cow profit center leads to double accounting when farm raised feeds are also charged in at fair market value.

In order to keep the calculation of overhead costs as simple as possible, overhead costs are estimated with some general farm management thumb rules. Thumb rules for depreciation, insurance, repairs, taxes, and interest (the *DIRTI-Five*) are presented in Table 1. The *DIRTI* factor for buildings is figured by setting depreciation at 5%, insurance at 1%, repairs at 1%, property Taxes at 0% (North Dakota does not have a property tax) and Interest at 0%. Interest in the generalized *DIRTI-Five* is set to one-half of the going interest rate to adjust for the fact that market value of assets depreciate.¹⁰ Interest is set to zero in this specific analysis because return on equity capital is part of the residual claimant in the bottom line of this economic analysis. The *DIRTI-five* for buildings (excluding Interest) in North Dakota totals 7%. Due to property taxes, your state's *DIRTI-Five* for buildings could be higher.

The *DIRTI-Five* for equipment in North Dakota is depreciation at 10%, insurance at 1%, repairs at 2%, taxes at 0%, and interest at 0% for a total of 13% (plus your property tax percentage in your state). Overhead costs on the breeding cows cover a 1% insurance charge on the investment value of the breeding herd. Your *DIRTI-Five* numbers maybe slightly different if your state has a property tax on building and/or equipment.

A common profit center error that beef farmers and ranchers tend to commit is to charge all of their farming machinery overhead costs to the beef cow profit center. Charging machinery overhead to the beef cow profit center leads to double accounting

Table 1. DIRTI Factors For Capital Asset Costs (North Dakota)

	<u>Buildings</u>		<u>Equipment</u>		<u>Cows</u>	
	<u>Ours</u>	<u>Yours</u>	<u>Ours</u>	<u>Yours</u>	<u>Ours</u>	<u>Yours</u>
Depreciation.....	5%	_____	10%	_____	--	_____
Interest.....	5.5%	_____	5%	_____	10%	_____
Repairs	1%	_____	2%	_____	--	_____
Taxes ^{a b}	____%	_____	____%	_____	____%	_____
Insurance	1%	_____	1%	_____	1%	_____
DIRTI Factor	12%	____%	18%	____%	11%	____%
Excluding Interest	7%	____%	13%	____%	1%	____%

^a Land taxes are changed to the crop/pasture profit centers and not to the cow herd.

^b Property taxes vary from state to state so this number is left blank for users of this form to enter in their own property tax numbers.

when raised feeds are also charged to the beef cow at market value.

Section 6: Unit Cost Of Production Summary

The unit cost of production summary presents the income and costs summarized on a per cow and on a per hundredweight of calf produced (steer equivalent) basis. *Earned returns per cow* are used to measure the beef farm or ranch family's earned returns to unpaid family and operator and labor, management, and equity capital. The per hundred weight column presents the *unit cost of producing* a hundred weight of steer calves. Unit cost of production becomes your breakeven cost of producing a hundred weight of steer calves. By using the "steer equivalent" procedure for calculating UCOP, Your UCOP can be directly compared to the market price of steer calves.

Are You A Low Cost or High Cost Producer?

You are now able to compare your unit cost of producing a hundred weight of steer calf with the average unit cost of production on a set of benchmark herds. The three benchmark herd averages presented in Table 2 are for the 1999 calf crop produced by North Dakota's Integrated Resource Management (IRM) Cooperators. These IRM Cooperators came primarily from North Dakota but a few herds came from Minnesota and Eastern Montana. These Northern Plains Benchmark Herds were used to construct the UCOP barometer presented in Table 2.

The Benchmark Herds were divided into three groups based on unit costs of producing a hundred weight of calf. The average costs come from the average of all of the 1999 Northern Plains Benchmark herds. The low cost number presents the average of the low cost 1/3 of the benchmark herds and the high cost number presents the average of the high cost 1/3 of the benchmark herds.

Keep in mind that these benchmarks are the three groups' averages. The range in the groups' average costs of production is \$56 to \$70 per cwt of calf produced ¹¹, however, the individual herds' unit costs of production was wider --ranging from a low of \$38 to a high of \$81 per hundredweight of calf produced.

Table 2. Unit Costs Of Producing A Hundred Weight Of Calf^a Based On Economic Analysis For Your Beef Cow Profit Center

\$56.00	\$62.00	\$70.00
low costs	average costs	high costs

^a The Unit costs of production range presented are the averages for the low cost 1/3, average of all herds, and the average for the high cost 1/3 North Dakota herds producing 1999 calves.

Place your unit costs of production in its appropriate place on the cost barometer in Table 2 and answer the following question:

I am a (low, ave or high) _____ cost producer.

Section 1: Production Profile

A. January 1 Number Of Beef Cows	= _____	Head
B. January 1 Inventory Of Replacement Heifer Calves	= _____	Head
C. SPA Adjusted Females Exposed To Bull Last Year	= _____	Head
D. Live Calves Born	= _____	Head
E. Live Calves Weaned _____ Steers, _____ Heifers _____ Bulls	= _____	Head
F. Number Of Cows Replaced	= _____	Head
G. Number Of Cows That Died	= _____	Head
H. Calves That Died	= _____	Head
I. Percent Calf Crop(E/C) x 100	= _____	%
J. Replacement Rate(F/A).....	= _____	%
K. Cow Death Loss(G/A)	= _____	%
L. Calf Death Loss(E/D)	= _____	%

Section 2: Gross Income

Herd #	Ave Wt	Amount	Units	Price	Total
1. Steer Calves	_____	_____	_____ Lbs	\$ _____	\$ _____
2. Heifer Calves ..	_____	_____	_____ Lbs	\$ _____	\$ _____
3. Cull Cows	_____	_____	_____ Lbs	\$ _____	\$ _____
4. Cull Rpl Heifers ..	_____	_____	_____ Lbs	\$ _____	\$ _____
5. Cull Bulls	_____	_____	_____ Lbs	\$ _____	\$ _____
6. Inventory change ...	Beginning \$ _____		Ending \$ _____	Change =	\$ _____
7. TOTAL GROSS INCOME.....				\$ _____	
8. GROSS INCOME PER COW (Item 7/ Item A).....				\$ _____	
9. TOTAL INCOME/COW IS EQUAL TO HOW MANY CWTS OF STEER INCOME? \$ _____					
9a. PRICE RECEIVED PER HUNDRED WEIGHT OF STEER CALF SOLD				\$ _____	

Section 3: Feed Cost

			Per Cow	Per Cwt
12. Pasture -- Going Rent	_____ A/Cow @	\$ _____/A	= \$ _____	
12a. Public Land Payment.....	\$ _____/Herd.../	_____ Cows	= \$ _____	
12b. After Math Grassing	\$ _____/Hd Da times	_____ Hd Da	= \$ _____	
13. Pasture Maintenance	\$ _____/Hd Da times	_____ A/Cow	= \$ _____	
14. Hay	_____ Tons@	\$ _____	= \$ _____	
15. Grain	_____ /Bu @	\$ _____	= \$ _____	
16. Salt & Mineral	_____ Lbs@	\$ _____	= \$ _____	
16A. TOTAL FEED COSTS			\$ _____	
16B. TOTAL FEED COSTS PER HUNDRED WEIGHT OF CALF SOLD				\$ _____

Section 4: Livestock Costs			
		Per Cow	Per Cwt
17. Vet & Medicine	\$___/Hd.....	\$_____	
18. Breeding	\$___/Hd.....	\$_____	
19. Marketing	\$___/Hd.....	\$_____	
20. Growing Costs Of Rpl Heifer	___%/Cow @ \$___/Hd =	\$_____	
21. Mach & Equip (Fuel,Rep& Maint)	\$___/Hd	\$_____	
22. Other	\$___/Hd	\$_____	
23. Interest On Operating Capital	\$___/Cow @ ___% =	\$_____	
24. Interest On borrowed Capital (Cows, Building, & Equipment)		\$_____	
25. Interest On Pasture Land Money Borrowed	\$_____	\$xxxxxx	
26. TOTAL LIVESTOCK COSTS (\$/COW)			\$_____
26a. RETURNS ABOVE FEED AND LIVESTOCK COSTS (\$/COW).....		\$_____	\$_____
26b. BREAK-EVEN PRICE PER CWT TO COVER DIRECT COSTS			\$_____

Section 5: Overhead Costs			
		Per Cow	Per Cwt
27. Breeding Herd Investment.....	\$___/Herd @ 1.0 %	\$_____	
28. Buildings (Beef Cows Only)	\$___/Herd @ ___%	\$_____	
29. Equipment (Beef Cows Only)	\$___/Herd @ ___%	\$_____	
30 . TOTAL OVERHEAD COSTS		\$_____	\$_____

Section 6: Unit Cost Of Production Summary			
		Per Cow	Per Cwt
31. TOTAL INCOME		\$_____	\$_____
32. TOTAL COSTS.....		\$_____	\$_____
33. <i>Earned Returns To Unpaid Family & Operator Labor, Management & Equity Capital</i>		\$_____	\$_____
34. BREAK-EVEN PRICE/CWT OF CALF SOLD TO COVER ALL COSTS ^a			\$_____

^a BREAK-EVEN Steer Price = (total costs/cow,[32])/Cwts of Steer Equivalent Income, [9])

¹ Profit is defined as the earned net returns to unpaid family and operator labor, management, and equity capital – the three resources contributed to the cow herd by the beef farm or rancher family.

² Most of our Northern Plains IRM Cooperators can raise hay cheaper year-in and year-out than they could buy hay year-in and year-out with one exception. That exception is the beef cow producer that has money borrowed for the hay baler, the tractor that pulls the baler, and maybe even money borrowed on the hay land. For these producers, the cost of raising hay year-in and year-out is typically higher than buying their hay year-in and year-out.

³ Integrated Resource Management Standardized Performance Analysis typically available through your State's Cooperative Extension Service and/or NCBA.

⁴ Integrated Resource Management Financial And Reproductive Management System available through North Dakota State University Extension Service.

⁵ A worksheet for calculating SPA Adjusted Females is available at www.ag.ndsu.nodak.edu/cow/irm/spaform.pdf. You will need Adobe Reader to access this file.

⁶ Since raised cow are on the depreciation schedule at zero value, the capital gains of raised cull cows equals the sales barn dollars generated.

⁷ The IRM-SPA Guideline recommends an alternative to the steer equivalent approach. It recommends that the joint products be handled by subtracting the non-calf income from total costs with the remaining costs attributed to the pounds of calf produced. The assumption here is that the non-calf income just equals the non-calf costs. This fact sheet, however was designed around the Steer Equivalent approach. One major advantage of this steer equivalent technique is that this unit cost of production can be directly compared to the market price of steer calves. This direct comparison facilitates marketing in that steer market price and UCOP are in the same units.

⁸ The true opportunity cost of a replacement heifer is the sum of the market value of the heifer calf held back plus the cost of growing and breeding that heifer. Interest cost on the value of the initial heifer calf for two years should also be included.

⁹ Item 26a is calculated by taking gross income per cow (Item 8) and subtracting total feed costs per cow (Item 16A) and subtracting livestock costs (Item 26). The break-even market price to cover direct

costs (feed costs plus livestock costs), Item 26B, is calculated by summing feed costs (Item 16A) plus total livestock costs (Item 26) and dividing by the total hundredweights of steer equivalents (Item 9).

¹⁰ Interest cost is frequently figured by using an average investment figure (purchase costs 0+salvage value) divided by 2 time interest rate. Instead, this was simplified by dividing interest into one-half.

¹¹ The narrowest range of any year analyzed. This is attributed to the fact that these IRM Cooperators have been analyzed their herds over several years and they are consciously lowering their unit cost of production over the years.



Managing for Today's Cattle Market and Beyond

Conducting A Comparative Analysis of Your Herd's Production Facts With Other Herds' Production Facts

By
Harlan Hughes
North Dakota State University

Introduction

A *Comparative Analysis* is the single most powerful farm and ranch management tool available. This tool works especially well as a way of identifying where beef farmers or ranchers should focus their management attention to increase profits in these tough times. This fact sheet takes a beef farmer or rancher through a step by step comparison of his beef cow profit center's production facts with the production facts of a set of benchmark herds.¹ Production areas *where the producer beats* the benchmark herds suggest potential strengths in the beef cow herd. Production areas *where the producer is beat by* the benchmark herds suggest potential weaknesses in his beef cow herd.

Benchmark Herds

The reason that benchmark herds are not used more by farmers and ranches is that they generally do not have access to other beef producers' herd data. The published North Dakota IRM 1994 Database, here after referred to as the Northern Plains Benchmark Herds, will be used as the benchmark herds in this fact sheet.²

Two Northern Plains benchmark summaries are used in the production comparisons described below. The first benchmark summary is the average, along

with the high and low values, for each individual benchmark factor. The second comparative benchmark is the average of the low 1/3 herds, middle 1/3 herds and high 1/3 herds grouped according to their unit costs of producing a hundred weight of calves. Even if producer's herd is not located in the Northern Plains, he should still find it useful to compare his beef cow profit center's production facts to the production fact of the Benchmark Herds.

Two key points that any producer need to be remember when conducting a comparative analysis of his beef cow profit center. First, his goal should be to use these benchmark herds to identify his herd's *potential production strengths* and his herd's *potential production weaknesses*. He should use these potential strength and potential weakness as a guide for focusing his management attention in these tough times.

Second, benchmark comparisons *do help* producers identify weakness but benchmark comparisons *do not tell producers* how to reduce weaknesses. You, as the manager, have to determine *how to reduce* your herd's potential weaknesses. Other fact sheets in this series were written to suggest how beef farmers and ranchers might reduce selected potential herd weaknesses.

Production Facts

1. SPA Adjusted Females Exposed

Table 1. Summary of Cows Leaving The Herd Since Last Year's Weaning

a. Number of cows that died.....	_____	Head
b. Number of cows sold because of age	_____	Head
c. Number of cows sold because of physical defects	_____	Head
d. Number of cows sold because of poor fertility or open	_____	Head
e. Number of cows sold because of inferior calves	_____	Head
f. Number of cow sold for replacement stock	_____	Head
g. Number of cows sold for unknown reasons	_____	Head
Total Number Culled		_____ Head
h. Total females Exposed To The Bull Two Seasons Ago	_____	Head
		h
I. SPA Adjustment = $\frac{\quad}{b} + \frac{\quad}{c} + \frac{\quad}{e} + \frac{\quad}{f} + \frac{\quad}{g} =$	_____	Head
		I
j. Cows Purchased.....	_____	Head
		j
k. Exposed/bred females sold	_____	Head
		k
l. Net Adjustment to females exposed	_____	Head
$l = I - j + k$		
m. SPA Adjusted Females Exposed	_____	Head
		h - l

The *National Integrated Resource Management Standardized Performance Analysis (IRM-SPA) Guideline* suggest that Production efficiency should be measured by the “*SPA Adjusted Females Exposed.*” This national guideline allows producers to adjust the females exposed for 1) why cows were culled, 2) for purchased female animals, and 3) for the sale of breeding females. Table 1 is designed to help producers determine their SPA Adjusted Females Exposed. While a producer’s herd may exceed the minimum or maximum size of the cow groups represented in Table 1, this is not critical to this comparative analysis. Table 2 is presented just to illustrate the range in herd sizes of the Benchmark herds.

Table 2. SPA Adjusted Females Exposed In The Benchmark Herds

36	166	480
Low	Average	High

Pregnancy Rate

Pregnancy rate is based on the number of females checked pregnant divided by the SPA Adjusted Females Exposed. The equation to use is:

$$\text{Pregnancy Percentage} = \frac{\text{No checked preg.}}{\text{Adjusted SPA Females}} \times 100 = \text{_____ \%}$$

Preg. Percent

Calculate your pregnancy percentage and post the value in the appropriate place on the barometer in Table 3 and determine if your pregnancy rate is a strength or weakness of your herd.

Table 3. Pregnancy Rate

86%	94%	100%
Low	Average	High

Calving Rate

Calving rate measures the number of females that had a live calf. Abortions are not included but still-borns are. Still-borns are also included in the calf death number. Calving rate is calculated with:

$$\text{Calving Rate} = \text{_____} \text{ divided by}$$

$$\frac{\text{Cows Calving}}{\text{SPA Adj Females}} \times 100 = \frac{\text{Calving Rate}}{\text{Calving Rate}} \%$$

Calculate your percent calf crop and post your answer to the barometer in Table 4.

Table 4. Calving Rate

82%	94%	100%
Low	Average	High

Percent Calf Death Loss

Percent calf death loss is the one production measure that is not based on females exposed. Percent calf death loss is based on the number of calves born. The formula is:

$$\text{Percent Calf Death Loss} = \frac{\text{No Dead Calves}}{\text{No Calves Born}} \text{ divided by } \frac{\text{No Dead Calves}}{\text{No Calves Born}} \times 100 = \frac{\text{No Dead Calves}}{\text{No Calves Born}} \%$$

Calculate your herd's percent calf death loss and post it to the barometer in Table 5 for your comparison to the benchmark herds.

Table 5. Calf Death Loss

0%	3%	11%
Low	Average	High

Percent Calf Crop

The primary reproductive efficiency measure suggested by the IRM-SPA Guidelines is the number of live calves weaned based, once again, on the SPA Adjusted Females Exposed. The formula is:

$$\text{Percent Calf Crop} = \frac{\text{Lives Calves Weaned}}{\text{SPA Adjusted}} \text{ divided by } \frac{\text{Lives Calves Weaned}}{\text{Females Exposed}} \times 100 = \frac{\text{Lives Calves Weaned}}{\text{Females Exposed}} \%$$

Table 6. The Percent Calf Crop

76%	92%	100%
Low	Average	High

Average Weaning Weight

Weaning weight is still the most observed production indicator used by the cow calf sector and does have some significant economic significance. While weaning weight statistically explains only 20 percent of the variation in unit costs of production in the benchmark herds, the weaning weight of the low cost 1/3 of the herds averaged the highest at 615 pounds.³ This compares to the middle 1/3 of the herds averaging 554 pounds and the high cost 1/3 of the herds averaging 547 pounds. Post your herd's average weaning weight on the two barometers in Tables 7a and 7b.

Table 7a. Average Weaning Weights (Unadjusted)

440	571	761
Low	Average	High

Table 7b. Average Weaning Weight By Cost Group

614 lbs.	554 lbs.	547 lbs.
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3

Pounds Of Calf Weaned Per Female Exposed

A second critical measure of the production efficiency of a beef cow herd is the pounds of calf weaned per female exposed. The range of the benchmark herds went from a low of 353 pounds per cow to a high of 751 pounds per cow with a 528 pound average (see Table 8a). Table 8b presents the average pounds weaned for the low 1/3, middle 1/3 and high 1/3 cost groups. Note that pounds weaned per female exposed goes down as unit costs of production go up. This suggests that one key to lowering costs of production is increased pounds of live calf weaned per female exposed.

Table 8a. Pounds Weaned Per Female Exposed

353	528	751
Low	Average	High

Table 8b. Pounds Weaned Per Female Exposed

569 lbs.	515 lbs.	501 lbs.
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3

Table 9. Summary Of Potential Strengths & Weaknesses For Your Herd

Item	Your Value	Benchmark Value	% Of Bench
1 SPA Adjusted Females Exposed	_____	_____	_____
2. Pregnancy Rate	_____	_____	_____
3. Calving Rate	_____	_____	_____
4. Percent Calf Death Loss	_____	_____	_____
5. Percent Calf Crop	_____	_____	_____
6. Average Weaning Weight	_____	_____	_____
7. Pounds Of Weaned Calf Produced Per Female Exposed.	_____	_____	_____

Production Strength and Weakness Summary

Now that you have completed your *Comparative Production Analysis*, enter in your herd's production values, the average benchmark values, and calculate your herd's percent of the benchmark values. Those production items with an index over 100, with the exception of percent calf death loss, (i.e., greater than 100%) are candidates to be your herd's potential strengths and those items with an index less than 100 are prime candidates to be your herd's weaknesses.

One Last Caution

There is no hard and fast rule for identifying your herd's strengths and weaknesses. The best procedure, of course, is to have a perpetual inventory of herd performance records that are compared to contemporary herds. North Dakota's Cow Herd Analysis Performance System (CHAPS) is one such perpetual inventory and contemporary system. CHAPS is available in 20 plus states. But short of having your own production records, this fact sheet may be your best alternative.

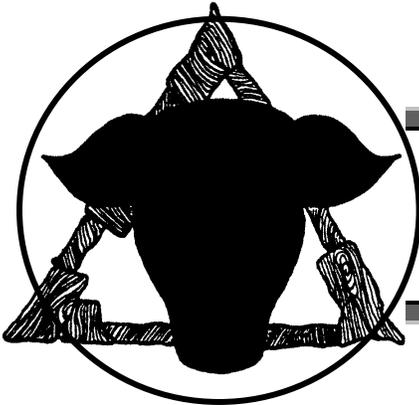
One other caution is that you, as the herd's manager, have to be the final decision maker on what is a strength or what is a weakness. Unique circumstances can make your herd's performance logically differ from the benchmark herds. If so, then ignore the benchmark signal and use your own judgment. In most cases, however, benchmark comparisons typically identify some strengths and weaknesses. In these tough times, the informed beef cow manager will focus his management energies toward capitalizing on his herd's strengths while trying to reduce his herd's weaknesses. When management energies are focused on facts and the

analysis of these facts rather than perceptions, profits generally increase.

¹ It is recommended that you divide your beef farm or ranch business into profit centers. A typical ranch should be divided into a beef cow profit center, a forage profit center, and a pasture profit center. If calves are backgrounded and or retained, you should also have a backgrounding profit center and a retained ownership profit center. The key, here, is to treat each profit center as a stand alone business. The forage fed is charged to the beef cow profit center at fair market value and the forage profit center is credited with the market value of forage produced.

² Harlan Hughes, "IRM-FARMS Databank 1994 Herds," Department Of Agricultural Economics, North Dakota State University, September 1995, 10 pages.

³ The herds with super large cows (average herd cow weights above 1500 pounds) were not the low cost herds in the benchmark. While I lacked sufficient number of the super large cow herds (weights above 1500 lbs) to do a formal study, I would hypothesize that as cow weight increases above 1500 pounds, that feed costs accelerate, reproductive efficiency drops and unit costs of reducing a hundred weight of calf increases at an increasing rate as cow weight increases. Big cows milk high, eat accordingly, and may well be limited by the environment. More research is needed on the economics of super large cows.



Managing for Today's Cattle Market and Beyond

March 2002

Benchmarking Your Herd's Economic Facts

By

Harlan Hughes, North Dakota State University

Dwight Aakre, North Dakota State University

Introduction

Benchmarking is the process of conducting a *comparative analysis* of your beef cow profit center with the averages of a set of benchmark herds and is the single most powerful farm and ranch management tool available. Benchmarking gets its management power from its identification of a herd's business strengths and weaknesses in the beef cow business. Capitalizing on the business strengths identified and correcting some or all of the business weaknesses identified is a sure recipe for increasing profits from the beef cow profit center.

Economic areas *where the producer's herd beats* the benchmark averages suggest areas of strength in his beef cowherd. Economic areas *where the producer's herd is beat by* the benchmark averages suggest areas of weakness in his beef cowherd. North Dakota's Integrated Resource Management (IRM) educational program has demonstrated that profits can be enhanced when a beef cow producers capitalizes on his herd's business strengths and removes some or all of his herd's business weaknesses. This fact sheet takes a beef farmer or rancher step-by-step through the recommended benchmarking process.¹

Benchmark Herds

The reason that benchmark herds are not used

more is the fact that farmers and ranchers generally do not have access to other beef producers' herd data. With this limitation in mind, North Dakota State University designed its IRM educational program in the early 1990s so that each IRM Cooperator's herd production and economic data was recorded in an annual *Northern Plains IRM Benchmark Database*. These databases were used in benchmarking each IRM Cooperator's herd annually. Selected years of this database have been published for use by all beef cow producers.

We now have a decade of benchmarking experience and have proved databasing's potential for improving beef cow profits.² Our assessment of this benchmarking process is that it *has made money for the participating beef farmers and ranchers* and substantial money for some producers. Even if your herd is not located in the Northern Plains, you should still find it useful to benchmark your beef cow profit center's economic facts against the averages of these benchmark herds.

Two different Northern Plains benchmark summaries are recommended for benchmarking and these two sets of benchmark numbers are provided in this fact sheet. First, you should benchmark your herd with the individual high and low values in the database along with the database averages. Now you know where your herd ranks with the other herds.

Second, you should benchmark your herd with the average of the low-cost one-third herds, the middle-cost one-third herds and the high-cost one-

third herds grouped by their unit costs of producing a hundredweight of calves. Now you will know if you are a low-cost or a high-cost producer.

There are two key points that you need to be remember when benchmarking your beef cow profit center. First, you should identify your herd's *potential economic strengths* and your herd's *potential economic weaknesses* to guide your future management actions. Second, you should remember, that while benchmark comparisons can help you identify weaknesses, benchmark comparisons do not tell you *how* to reduce the weaknesses. You, as the manager, have to determine how to reduce or remove your herd's potential weaknesses. If you follow these two key points, profits will increase in your beef cow herd.

***Favorable Net-Value-Added Benchmarks
Are Projected Through Year 2004***

Net-value-added is one of the key business management benchmarks used to measure profitability in the beef cowherd.³ Specifically, net-value-added is the net dollars earned by the farm or ranch family's three resources – unpaid family and operator labor, management, and the family's equity capital – contributed to the beef cow herd. It is the bottom-line business benchmark used to answer the question: "How much added economic value did my family generate by running the beef cow herd this year?" Net-value-added is one of the primary "green-flags/red-flags" used to signal the economic performance of the beef cow profit center.

Figure 1: Beef Cow Profits: Net-Value-Added (North Dakota Farm Business Management Herds)

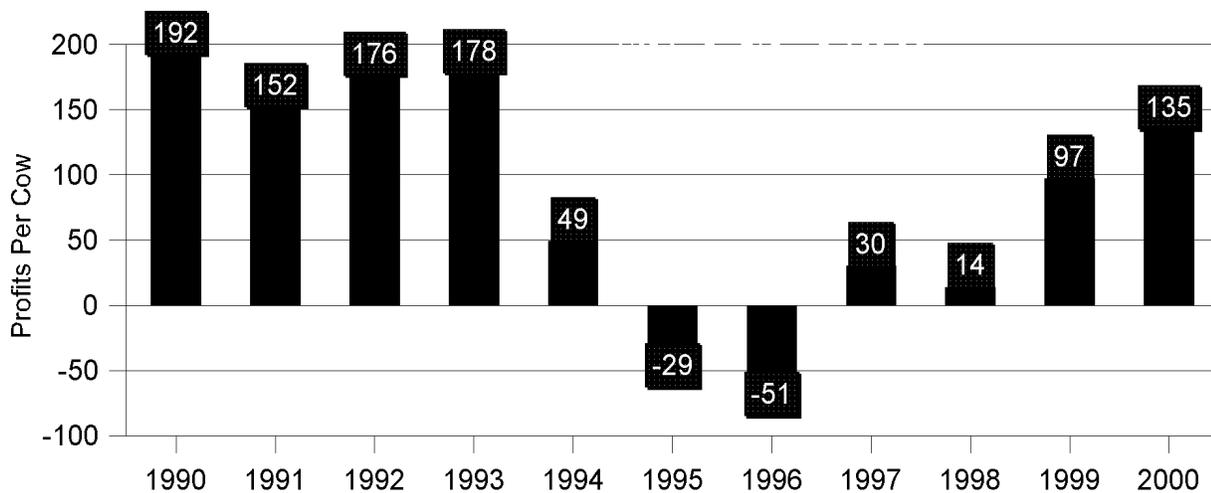


Figure 1 presents the historical net-value-added benchmarks generated by North Dakota's Farm Business Management herds during the decade of the 1990s. After several favorable (green-flag) years in early 1990s, the first "yellow-flag" came in 1994 and the first of two "red-flags" came in 1995. The second "red-flag" came in 1996. "Green-flags" came in 1997 and again in 1999. Today, we are again getting "green-flag" signals from typical ranchers' net-value-added benchmarks.

Projections are for two or three more "green-flag" net-value-added years (2002 - 2004). We recommend that producers use this projected "favorable times" to build a financial reserve in anticipation of the cattle cycle's next cyclical

downturn. A typical cattle cycle repeats approximately every 10 years; therefore, the next cyclical downturn is projected for 2005 through 2007 time period.

History suggests that the current good times are not times for management as usual. Beef farmers and ranchers should use these good times to increase economic efficiency and to build a financial reserve. We think the best way to do this is to develop, utilize and perfect a set of benchmark measures for your herd during the good years. Then, use these benchmark measures to identify early "red-flags" in your beef cow profit center during the next cyclical downturn.

The Recommended Benchmarks

Listed below are our recommended benchmarks for managing a beef cowherd. Beef farmers and ranchers are strongly encouraged to utilize all of these benchmarks to identify their herd's strengths and then capitalize on these strengths. Producers can use these same benchmarks to identify their herd's weaknesses and then try to remove or minimize these weaknesses from the beef cowherd.

Net-Valued-Added

As discussed above, net-value-added is a key benchmark measure of a beef cow herd's business performance. Remember, earned net-value-added is the earned payments to the farm or ranch family for its unpaid family and operator labor, management, and equity capital contributed to the beef cow herd. It is important to know what your family earned from running beef cows last year. Another Fact Sheet in this series provides a step-by-step procedure for calculating your herd's net-value-added.⁴ Use this

other fact sheet to calculate your net-value-added and then use this fact sheet to benchmark your earned economic returns.

Use Table 1a to compare your herd to the total Northern Plains Benchmark herds and use Table 1b to compare your herd to the Benchmark Herds grouped by unit costs of producing a hundredweight of calves. Calculate your herd's net-value-added as a percentage of the benchmark averages. How does your herd compare to these benchmark herds? Did you beat these benchmark herds or did the benchmark herds beat your herd?

Table 1a: Net-Value-Added From Northern Plains Benchmark Herds (1999 Calves)

\$-7	\$129	\$281	Your Herd
Low	Average	High	\$ _____

Table 1b: Net-Value-Added Based On Average of Low-Cost 1/3, Middle-Cost 1/3 and High Cost 1/3 Of Northern Plains Benchmark Herds

\$145	\$61	\$64	Your Herd
Low Cost 1/3	High Cost 1/3	Middle Cost 1/3	\$ _____

Table 2. Total Capital Invested In Breeding Herd

a.	Capital invested in the breeding herd	\$ _____
b.	Beef cow equipment investment (do not include haying machinery)	\$ _____
c.	Beef cow facility investment	\$ _____
d.	Pasture land investment – Use only land grazed by beef cows	\$ _____
e.	Total capital investment in your beef cow profit center	\$ _____
f.	Number of beef cows in beginning inventory (mature cows + bred heifer)	_____ /Head
g.	Capital investment per cow (e divided by f)	\$ _____ /Cow

Total Capital Invested Per Beef Cow Profit Center⁵

Capital investment in the beef cow profit center can be an important determinant of overall production costs associated with running a beef cowherd. In this comparative economic analysis of the beef cow profit center, capital investment should be limited to the market value of (1) the breeding herd, (2) beef cow equipment and facilities, and (3) the pasture land used by the cow herd only. The beef cow profit center investment does not include farmland or farming machinery as these are part of another profit center. *Note, the capital investment in the baler and the tractor used to pull the baler are not included in the beef cow profit center.* They are part of the forage

profit center. This is somewhat contrary to what many beef farmers or ranchers typically think.

Use Table 2 to calculate your total investment in your beef cow herd profit center and then divide by the number of cows in your January 1 inventory.⁶

Take your capital investment per cow (Item g, Table 2) and post it to the barometers presented in Tables 3a and 3b. Table 3a compares your herd to the total Northern Plains Benchmark herds and Table 3b compares your herd to the same Benchmark Herds grouped by unit costs of producing a hundredweight of calves. Calculate the percent your herd is of the benchmark average. Is your capital investment per cow high or low? Remember, some producers lease

pastures while other producers lease cows – both reducing the capital investment needed to operate a beef cow herd. Table 3b suggests that the average capital investment per cow was not generally much different between cost groups.

Debt Per Cow

Debt per cow should include only that debt directly associated with the beef cowherd profit center. Debt per cow should be limited to (1) breeding herd debt, (2) beef cow equipment and facility debt, and (3) pasture land debt.⁷ Farm machinery debt should not be included. Use Table 4 to calculate your

Table 4. Total Capital Invested In Breeding Herd

a. Beef cow debt	\$ _____	/Herd
b. Heifer debt	\$ _____	/Herd
c. Bull debt	\$ _____	/Herd
d. Beef cow facility and equipment debt	\$ _____	/Head
e. Pasture land debt	\$ _____	/Head
f. Total beef cow profit center debt	\$ _____	/Herd
g. Number of beef cows in beginning inventory	_____	Head
h. Total beef cow debt per cow	\$ _____	/Head

Table 5a. Range in Debt per Cow for Northern Plains Herds)

\$0.00	\$276	\$1089	Your Herd
Low	Average	High	\$ _____

Table 5b. Range in Debt per Cow by Cost Group

\$383	\$392	\$294	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$ _____

Debt Service per Cow

Debt service per cow covers both the interest and principal payment associated with the beef cow profit center debt. There is no charge for equity capital as it is treated as one of the residual claimants in the bottom line net-value-added calculated for the beef cow profit center. This suggests that debt-servicing costs are part of unit cash costs of production while the cost of equity capital is not part of the unit cash costs of production. Our management recommendation is for beef cow producers to pay down as much of debt as possible over the 2002-2004

debt per cow and then post your per cow debt on the barometers in Table 5a and 5b.

Table 3a. Per Cow Capital Investment Range of the Benchmark Herds. (Investment In Breeding Herd, Beef Cow Equipment, Facilities and Pasture Land)

\$885	\$2018	\$3691	Your Herd
Low	Average	High	\$ _____

Table 3b. Capital Investment Based on Average of Low Cost 1/3, Middle Cost 1/3 and High Cost 1/3 of the Herds in the Database

\$1861	\$2244	\$1952	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$ _____

time period.

Calculate your debt service per cow and post it to the barometers in Tables 6a and 6b. Remember that farm land debt and machinery debt are not to be included. Note from Table 6b that the low-costs and high-cost herds have very similar debt service per cow. This has not been true for all years. In some other years, the high-cost herds frequently have had a higher average debt service per cow.⁸ Since beef prices go in cycles, debts set up in the good times are extremely difficult to service in the tough times. One needs to continually keep beef price cycles in mind when considering additional debts for the beef cow profit center.

Table 6a. Average Debt Service Per Cow⁹

\$0	\$29	\$113	Your Herd
Low	Average	High	\$ _____

Table 6b. Average Debt Service Per Cow by Cost Group¹⁰

\$40	\$40	\$31	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$ _____

Accrual Adjusted Income per Cow

A beef cow profit center generates both cash and non-cash income and both have to be taken into account when preparing the accrual-adjusted income for the beef cow profit center. The cash income is most readily identifiable as it relates to the cash generated at sale time. Calf sales reflect the cash income generated from calf sales. If you did not actually sell the calves, value the steers, and all heifers not held back for breeding, as if they had actually been sold at weaning. Remember, backgrounding is a different profit center.

Economic value of the cull cows is the capital gains rather than the income from cash sales. A capital gain is the difference between the book value (purchase price minus depreciation taken to date) and the selling value of the cull cow.¹¹ Capital gains can be positive or negative. Cull bulls are also accounted for through capital gains and not cash income. The capital gains for all bulls sold are the difference between the book value (purchase price minus depreciation taken to date) and the cash value when sold. Again, capital gains can be positive or negative.

The final component of the beef cow profit center's accrual adjusted income is inventory change. You must first calculate a beginning inventory dollar value for the beef cow herd along with an ending inventory dollar value.¹² Inventory change is calculated by subtracting beginning inventory value from the ending inventory value. Remember that inventory change can be positive or negative.

Adding up the six components of income generates the accrual-adjusted income for the beef cow profit center. You should have already calculated gross income for your beef cow herd in a previous fact sheet. Post your gross income per cow to the barometers in Table 7a and 7b. The benchmark data presented in Tables 7a and 7b are for 1999 calves. Year 2000 and 2001 benchmark data is not available.

Table 7a. Accrual Adjusted Income Per Cow (1999)

\$325	\$451	\$633	Your Herd
Low	Average	High	\$ _____

Table 7b. Accrual Adjusted Income Per Cow by Cost Group (1994)

\$456	\$397	\$402	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$ _____

Summer Grazing Costs Per Cow

Use local pasture rental rates to calculate your pasture economic costs. Note that rented and deeded lands are both accounted for by rental rates. Actual dollars of public land payments are used for the cost of public lands. Then, take your total pasture costs and divide by the number of cows in your herd at the beginning of the business year (normally this is the January 1 inventory number). Post your herd's total pasture cost (summer and winter pastures) per cow on the barometers in Tables 8a and 8b.

Table 8a. Summer Grazing Costs Per Cow

\$38	\$73	\$115	Your Herd
Low	Average	High	\$ _____

Table 8b. Summer Grazing Costs by Cost Group

\$1861	\$2244	\$1952	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$ _____

Winter Feed Costs Per Cow

Winter feed costs cover those feed costs from the time that the cows are moved off pasture grazing until grass turnout in the next spring. Feeds should be valued at local market prices – not costs of production. Producers with extensive winter pastures may want to think of this as the stored feeding program as winter grazing costs are part of the summer pasture costs. You should post your winter (stored) feed costs to the barometers in Tables 9a and 9b to see how your winter (stored) feed cost compares to the benchmark herds.

Table 9a. Winter Feed Costs Per Cow (Feeds Value at Market Value)

\$57	\$123	\$196	Your Herd
Low	Average	High	\$ _____

Table 9b. Winter Feed Costs Per Cow by Cost Group (Feeds Value at Market Value)

\$129	\$140	\$138	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$ _____

Total Feed Cost Per Cow

Total feed costs, summer plus winter, account for 50 to 60 percent of total costs of running beef cows; therefore, feed costs should get more management attention than any other single cost

category. We find, however, that beef farmers and ranchers spend hours and hours feeding cows but they spend very little, or no time at all, managing the feeding program. Take your total feed cost calculated in another fact sheet and enter your total feed costs on the barometers in Tables 10a and 10b.

Table 10a. Total Feed Cost Per Cow (Feeds Value at Market Value)

\$119	\$198	\$287	Your Herd
Low	Average	High	\$

Table 10b. Total Feed Cost Per Cow (Feeds Value at Market Value)

\$195	\$212	\$216	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$

Vet and Medicine Cost Per Cow

Veterinarian and medicine costs for the benchmark herds range from \$6 per cow to \$33 per cow with an average of \$17 per cow. Post your vet and medicine cost to the barometers in Tables 9a and 9b.

Table 11a. Veterinarian and Medicine Costs Per Cow

\$6	\$17	\$33	Your Herd
Low	Average	High	\$

Table 11b. Veterinarian and Medicine Cost Per Cow by Cost Group

\$14	\$20	\$21	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$

Total Livestock Costs and Cow Lease Payments

Take your previously calculated livestock's cost and post it to the barometers in Tables 12a and 12b. If you also are running leased cows, you should also include a lease payment here equal to the market value of the calves and cull cow income allocated to the cow owner. There are several leased herds in the Benchmark Herds.

Table 12a. Total Livestock and Lease Payment Costs

\$32	\$68	\$94	Your Herd
Low	Average	High	\$

Table 12b. Total Livestock and Lease Payment Costs

\$68	\$68	\$73	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$

Overhead Costs

You should take the overhead costs that you calculated in another fact sheet and post that value to the barometers in Tables 13a and 13b.

Table 13a. Overhead Costs for Buildings, Equipment, and Breeding Herd

\$10	\$40	\$104	Your Herd
Low	Average	High	\$

Table 13b. Overhead Costs for Buildings, Equipment, and Breeding Herd

\$34	\$37	\$42	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$

Total Costs of Production Per Cow

Take your total cost per cow and post it to the barometers in Table 14a and 14b. Remember that the benchmark costs do not include the costs of backgrounding or finishing calves; nor should your costs include backgrounding or finishing costs. These are separate profit centers.

Note the \$221 dollar difference between the low-cost and the high-cost herds. Yes, management does make a difference.

Table 14a. Total Production Costs Per Cow (Excluding Unpaid Family and Operator Labor, Management, and Equity Capital) (1994)

\$181	\$322	\$402	Your Herd
Low	Average	High	\$

Table 14b. Total Production Costs Per Cow by Cost Group (Excluding Unpaid Family and Operator Labor, Management, and Equity Capital) (1994)

\$311	\$333	\$340	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$

Beef cow producers should always express their costs of production in the same unit that they sell their production. If we tell you that it cost Northern Plains beef cow producers \$322 per cow, on average, to run a cow in 1999, what would you know about these Northern Plains' herds? Not much -- as we have told you nothing about their level of production. A herd with the highest per cow costs may, due to its higher production, have the highest profits. This is why we do not favor reporting costs on a per cow basis. Unit cost of producing a hundredweight of calf is much more useful.

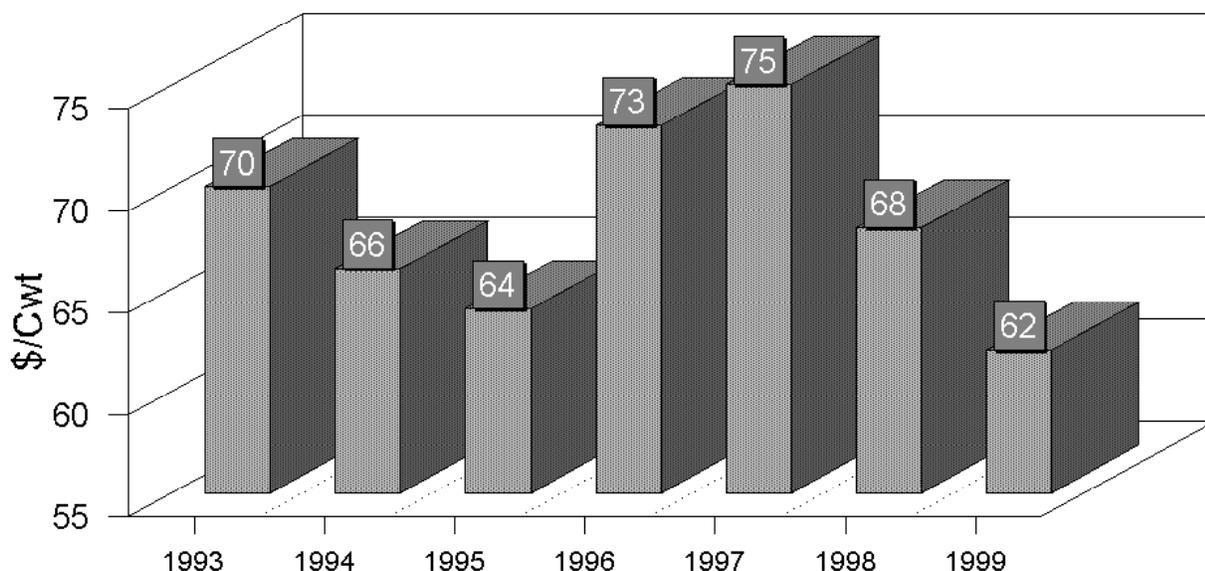
Unit Cost of Producing A Hundred Weight of Calf (UCOP)

What is UCOP? UCOP is a ratio of all production costs associated with operating a beef cow herd placed in the numerator and the total pounds of calf produced placed in the denominator (see Figure 1).¹³ This ratio gives the unit dollar cost of producing a hundredweight of calf.

Figure 2 summarizes the annual average UCOP for our Northern Plains IRM Cooperator herds for

years 1993 through 1999. It is clear that average UCOP changed as these Northern Plains beef cow producers went through the last cattle cycle. Remember, as you study figure 2, that calf prices peaked in 1993 and worked dramatically lower into 1996. We can also see in Figure 2 that beef cow producers did reduce costs as times got tough. Many different cost cutting moves were implemented in 1994 and 1995. We had some IRM Cooperators cut out all preventive medicine and we also had IRM Cooperators cut bull expenditures in half during these tough times.

Figure 2: Unit Cost of Production for Northern Plains Benchmark Herds (1993 - 1999)



Our biggest worry during this last cycle's price downturn was over the possibility that producers could actually cut cost too much. We worried about the question: "Could a producer cut costs one dollar and reduce income by two dollars with the net result being that of lowering net revenue even more?"

Our IRM data confirmed this worry was "right on" by illustrating the double whammy generated in year 1996. In the year of the lowest calf prices, these IRM Cooperators experienced a UCOP increase! If you want to put a herd under financial stress, just increase UCOP as price goes lower. That is just what happened in our Northern Plains herds in 1996.

You will become a better marketer if you know your actual costs of producing what you are selling. Most producers, however, do not know their breakeven price of the calves that they are selling and

do not know if current market price is above or below breakeven. The key to marketing is to know your unit cost of production.

Take your unit costs of production that you prepared in a previous fact sheet and post it to the barometers in Tables 15a and 15b. The most important question that you need to answer is: "Are you a high cost or low cost producer?"

Table 15a. Unit Cost of Producing A Hundred Weight of Calf Table

\$38	\$62	\$81	Your Herd
Low	Average	High	\$ _____

Table 15b. Unit Cost of Producing a Hundred Weight of Calf

\$56	\$66	\$70	Your Herd
Low Cost 1/3	Middle Cost 1/3	High Cost 1/3	\$ _____

Table 16. Strength and Weakness

	Economic Item	Your Value	Benchmark Value	% of Benchmark
1.	Number of beef cows in the beginning inventory	_____	_____	_____
2.	Total capital invested per beef cow	_____	_____	_____
3.	Debt per cow	_____	_____	_____
4.	Debt service per cow	_____	_____	_____
5.	Accrual adjusted income per cow	_____	_____	_____
6.	Summer grazing costs	_____	_____	_____
7.	Winter feed costs per cow	_____	_____	_____
8.	Total feed cost per cow	_____	_____	_____
9.	Veterinary and medicine cost per cow	_____	_____	_____
10.	Total livestock costs and cow lease payments	_____	_____	_____
11.	Overhead costs	_____	_____	_____
12.	Interest payment on borrowed capital	_____	_____	_____
13.	Total costs of production per cow	_____	_____	_____
14.	Unit cost of producing a hundred weight of calf	_____	_____	_____

Production Strength and Weakness Summary

Now that you have completed your *Comparative Economic Analysis* benchmarking your beef cow herd's economic facts to the economic facts of the Northern Plains Benchmark Herds, you are encouraged to complete Table 16 as your Comparative Analysis Summary. Enter in your herd's economic values, the average benchmark values, and calculate your herd's percent of the benchmark values. Those economic items with an index over 100 (i.e., greater than 100%) are prime candidates to be your herd's potential strengths and those items with an index less than 100 are prime candidates to be your herd's potential weaknesses. Now, implement a management program that capitalizes on your strengths and removes some or all of your weaknesses. Our IRM Cooperators have demonstrated that a management plan driven by economic facts from your herd will increase beef cow profits.

Final Comment

One final comment is that you, the herd manager, have to be the final decision maker on what is a strength and what is a weakness. Unique circumstances can make your herd's performance logically differ from the benchmark herds. If so, then ignore the benchmark signal and use your own judgment. In most judgment cases, however, comparisons to benchmark herds do identify some strengths and some weaknesses. The informed beef cow manager, that works from his herd's facts rather than from gut feelings and perceptions, will be better able to increase economic efficiency and to build a financial reserve. Both of these actions will allow a producer to better weather the next cyclical downturn projected in 2005 to 2007 time period. When perception is replaced with facts and these facts are analyzed, profits increase.

¹ It is recommended that you divide your beef farm or ranch business into profit centers. A typical ranch should be divided into a beef cow profit center, a forage profit center, and a pasture profit center. If calves are backgrounded and or retained, you should also have a backgrounding profit center and retained ownership profit center. The forage fed is charged to the beef cow profit center at fair market value and the forage profit center is credited with the market value of forage produced. The key, here, is to treat each profit center as a standalone business.

² To illustrate the potential for improved economic efficiency, consider again the North Dakota IRM database. In 1999, all of the participating Northern Plains IRM Cooperators were operating highly tuned beef cow businesses. Approximately one-half of these cooperators had been specifically working on their economic efficiencies for five plus years. For 1999, these experienced IRM cooperators generated the lowest average annual calf production costs of any year in the Northern Plains IRM Cooperator databank. These low unit costs were the direct result of high economic efficiencies. Even so, thirty-three percent of these IRM herds *still have considerable* room for improving their economic efficiencies if the average of the low-cost one-third of these 1999 Northern Plains IRM Herds is used as the benchmark.

³ Besides the *net-value-added* being discussed above, two other primary IRM measures are *net-cash-flow* and *net-financial-return*. It turns out that negative net-cash-flow is usually the earliest “red-flag” signal that a manager receives during cyclical downturn. Negative net-value-added is the second red-flag and negative net-financial-return is the third red-flag in a cyclical downturn. On the cyclical upswing, net-financial-return turns positive first, net-value-added turns positive second, and net-cash-flow turns positive thirds. For a detailed discussion on these “red-flag/green-flag” business indicators, see the fact sheet in this series entitled “Taking Your Beef Cow Herd Profitably Through The Cattle Cycle.”

⁴ The title of the fact sheet is “Determining Your Economic Unit Costs Of Producing A Hundredweight of Calf” by Harlan Hughes and Dwight Aakre, North Dakota State University.

⁵ The IRM-SPA Guidelines suggest than an economic analysis should be based on the number of cows in inventory on the first day of the business year – normally January 1st.

⁶ The IRM-SPA Guidelines suggest than an economic analysis should be based on the number of cows in inventory on the first day of the business year – normally January 1st.

⁷ Debt for farmland and farming machinery should not be included even in a total ranch situation. When farm feeds are charged into the cowherd profit center at market value, your farmland and farming machinery debt needs to be charged to the feed profit center.

⁸ Ranchers perceive that debt service is what determines high vs. low costs of production. My data does not confirm this. Debt service apparently is not a critical determinant of unit cost of production.

⁹ The debt service numbers reported here were calculated as the database for this publication does not pick up the principal payment for each IRM herd. These calculated payments are based on 10-year repayment period and 9 percent annual interest rate.

¹⁰ See footnote 9.

¹¹ Since raised cow are on the depreciation schedule at zero value, the capital gains of raised cull cows equals the sales barn dollars generated.

¹² We recommend that per animal values be help constant for the total year so that inventory changes reflect changes in animal numbers and/or mix of animal classes rather than changing market value of the animals. We recommend that you change your animal values between years rather than during the year.

¹³ Cwts is actually hundredweights of steer equivalent income. Accrual adjusted gross income from selling calves, cull cows, cull bred heifers, and cull bulls are summed and divided by the price of steer calves sold. This process is used to calculate the Cwts of steer calf equivalent in income to the accrual adjusted gross income from the beef cow profit center. In 1999 my IRM Cooperators produced 760 actual Cwts of calves and 847 Cwts of steer equivalent income from their herds when inventory adjustment and cull animal incomes are also taken into account.



Managing for Today's Cattle Market and Beyond

Understanding Your Financial Situation

By
Dennis A. Kaan
University of Wyoming

Understanding your financial situation is important for agricultural producers at any point in time but is especially important at the present time for livestock producers. Measuring financial performance is vital during times of depressed prices received for agricultural products. The tendency for agricultural managers historically has been to try to produce their way out of difficult times, but unless they measure financial performance, they could be producing their way out of business as easily as producing their way out of difficult times. The bottom line is, if managers don't measure financial performance, they won't know what influence changes in production practices will have on financial performance and with today's prices, guesswork is not acceptable.

This article will focus on two major areas for producers to get a handle on the financial performance of their operations, financial statements required to measure financial performance, and then financial performance measures. The Farm Financial Standards Council (FFSC) has recommended a minimum set of financial statements which include a balance sheet, income statement, statement of cash flows, and statement of owner equity. Basic concepts and formats for these statements will be discussed. The council also has recommended sixteen financial performance measures as a starting point in an evaluation of an agricultural operation. These sixteen measures are grouped

into liquidity, solvency, profitability, financial efficiency and repayment capacity measures. Each category of measurement will be discussed along with a presentation of calculation procedures and general guidelines for interpretation.

Financial Statements

The primary goal of financial reporting and analysis is to provide information that is useful to the internal and external users of this information. Internal users of financial information are people who control the resources of the operation, or the decision makers. External users are people who do not directly control the resources of the operation. These would include bankers, accountants, the Internal Revenue Service, and possibly stockholders.

The Balance Sheet: The balance sheet, or statement of financial position, presents a financial snapshot of a business at a point in time. It is a summary of all assets, liabilities and owner equity and their relationship to each other as of the date the balance sheet is filled out. The balance sheet reflects the cumulative effect of past transactions but does not describe how the existing financial position was achieved.

The FFSC made general recommendations regarding the format for the balance sheet. Assets and liabilities should be segregated into current and non-

current categories. Non-current asset categories should be further segregated into machinery and equipment, breeding livestock, buildings and improvements and land. Non-current liability categories should be broken down into real estate debt and notes payable, other than real estate debt. The balance sheet should present both cost basis and fair market value information for capital assets, formatted in one of two methods, a double column approach or market values on the face of the balance sheet with disclosure of cost information attached. The owner equity section of the balance sheet should contain a valuation equity component and a retained earnings/contributed capital component. Valuation equity represents the difference between the net book value and market value. Retained earnings in the business and contributed capital of the owners in the business represent the remainder of owner equity.

The Income Statement: The primary purpose of an income statement is to compute the profit of a business over a specified period of time. An income statement may also be referred to as an operating statement or a profit and loss statement. This statement addresses the question: “Did the business make a profit during the time period specified?” The result is net income. The time period specified is called the accounting period and usually covers a twelve month period. Net income should explain the change in owner equity between the beginning and ending balance sheets.

The revenue section is the first portion of the income statement. Gross revenue on an accrual basis is calculated here. This means that both cash and non-cash revenues are included. Net income from operations is calculated by subtracting accrual expenses from gross revenue. Accrual expenses include cash and non-cash expenses incurred to generate the revenue. Net income from operations plus gains/(losses) on the sale of capital assets equals net accrual income. This format will allow calculation of several important financial ratios which will be discussed shortly.

Statement of Cash Flows: One key to financial success is maintaining sound cash flows. The statement of cash flows provides a summary of cash receipts and cash payments during a specified time period. This statement format breaks the cash flows into operating, investing and financing activities. This information is very helpful to managers in identifying and controlling cash flows. What did the manager do

with cash earned from business operations? What did the manager do with cash obtained from financing or from the sale of investments? Where did the cash for new investments or repaying debt originate - from operations, from debt financing, or sale of investments? These are questions that can be answered with information from this financial statement.

Statement of Owner Equity: Owner equity and net worth are terms often used interchangeably by non-accountants and essentially mean the same thing. Owner equity is used in statements prepared for business only entities. Net worth is used in statements prepared for combined business and personal entities. The main concept of this statement is to reconcile owner equity reported at the beginning of the accounting period with that reported at the end of the period. This reconciliation verifies that the financial statements are in agreement.

The statement of owner equity is organized in such a manner as to clearly identify changes in owner equity. Owner equity can change via only a few sources. The first source of change is from retained earnings and contributed capital. Retained earnings are the portion of net income reinvested into the business. Contributed capital is capital invested into the business from outside sources. The second source of change is from valuation equity, discussed previously.

Financial Performance

In today’s capital intensive agricultural operations the need for measurement of financial performance is crucial to provide lenders and investors information regarding the “health” of the operation. Financial analysis of an agricultural operation must evaluate “financial position” and “financial performance.” Financial position refers to the total resources of the operation and the claims against those resources at a single point in time. Financial performance refers to the results of production and financial decisions made over one or more periods of time. Financial ratios are the tool used to provide financial performance measures. Table 1 provides exact financial ratios for each measurement category that will be discussed here.

Liquidity: Liquidity refers to the ability of a business to meet financial obligations as they come due without hurting the normal operations of the business. It is a measure of a firm’s ability to repay current

debts by converting current assets into cash. Liquidity is a short run concept since we are dealing in current assets and current liabilities. In general, the more cash that is available to pay current debts, the more liquid the firm is said to be. FFSC recommendations for liquidity measures include the current ratio and working capital.

Solvency: Solvency is a measure of the firm's risk-bearing ability. Solvency measures provide an indication of the firm's ability to repay all financial obligations if all assets were sold. It also can indicate the ability to continue operations as a viable business after a financial adversity strikes which would result in increased debt or reduced equity. Solvency, as compared to liquidity, is a long run concept since these measures deal with the ability of the business to survive in the future. Solvency measures recommended by the FFSC include debt/asset ratio, equity/asset ratio and debt/equity ratio.

Profitability: Profitability measures the profit generated from the use of available resources such as land, labor, capital and management. It is a goal of every business to be profitable. One thing not understood by everyone is the fact that a business can be liquid and solvent and not be profitable. This can usually be traced to inefficient use of resources in the operation. This fact demonstrates the need for using more than one category of financial performance measure. The FFSC has recommended rate of return on assets, rate of return on equity, operating profit margin ratio and net income as basic measures of profitability.

Financial Efficiency: Financial efficiency measures the intensity with which a business uses its assets to generate gross revenues. This is measured by the asset turnover ratio. Operational ratios represent the total composition of gross revenues. These ratios are operating expense ratio, depreciation expense ratio, interest expense ratio and net income from operations ratio. In general, the only one of these ratios with a rule of thumb is the interest expense ratio, which should be less than 0.15:1 to allow for a profitable operation.

Repayment Capacity: Repayment capacity measures the ability of a borrower to repay term debt from net income. Without capital contributions from outside sources, principal payments on term loans must come from net income after owner withdrawals. The ability of the operation to meet short term obligations

was discussed in relation to liquidity. Repayment capacity is a long run concept resulting from the long term profitability of the operation. Term debt and capital lease coverage ratio, and capital replacement and term debt repayment margin are two measures of repayment capacity recommended by the FFSC.

What Does It All Mean?

In times of low prices received for livestock produced, the first area to be affected in the operation is cash flows. Sufficient levels of cash are not generated from the sale of the livestock and profitability in general is the first to suffer. Remember, the statement of cash flows will shed light on which activities are generating cash within the operation. Reduced profitability, measured by net income and return on assets within an operation leads to serious problems in both the short run and long run. In the short run, liquidity is reduced and producers find it hard to meet current obligations on time. One of the first ratios a lender will evaluate is the current ratio. The rule of thumb is if the current ratio is less than 1.5:1, the operation may experience trouble meeting its current obligations and debt levels begin to increase or assets are sold to meet obligations. Repayment capacity is also adversely affected as a result of reduced profitability and lenders will watch this measure as time goes along. If reduced profitability persists over time, ultimately solvency is adversely affected. Solvency measures the risk bearing ability of the operation. This ratio is carefully watched by lenders and when solvency erodes, borrowing power also erodes. If the debt to asset ratio goes above 0.5:1, creditors have a greater claim on the assets than the operators and the business is no longer considered solvent.

Livestock producers must know their financial position and performance in order to plan for the future. Right now the future is dim and producers must have a plan laid out with their lenders in order to get through until higher livestock prices return. Without financial analysis to guide this planning process, financial ruin has a greater probability of occurring than longevity in the livestock business.

Table 1. Financial Performance Measures

Measures of Performance	Calculation Method	Rule of Thumb
<i>Measures of Liquidity</i>		
Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	Value => 1.5:1
Working Capital	Current Assets - Current Liabilities	Monitor for Increasing Trend Over Time
<i>Measures of Solvency</i>		
Debt/Asset Ratio	$\frac{\text{Total Liabilities}}{\text{Total Assets}}$	Value <= 0.5:1, Monitor for Decreasing Trend Over Time
Equity/Asset Ratio	$\frac{\text{Total Equity}}{\text{Total Assets}}$	Value => 0.5:1, Monitor for Increasing Trend Over Time
Debt/Equity Ratio	$\frac{\text{Total Liabilities}}{\text{Total Equity}}$	Value <= 0.5:1, Monitor for Decreasing Trend Over Time
<i>Measures of Profitability</i>		
Rate of Return on Assets	Net Income from Operations + Farm Interest Expense	Higher Value, More Profitable
	- Owner Withdrawals for Unpaid <u>Labor and Management</u> Average Total Assets	
Rate of Return on Equity	Net Income from Operations - Owner Withdrawals for Unpaid <u>Labor and Management</u> Average Total Equity	Higher Value, More Profitable
Operating Profit Margin Ratio	Net Income from Operations + Farm Interest Expense - Owner Withdrawals for Unpaid <u>Labor and Management</u> Gross Revenues	
<i>Measures of Financial Efficiency</i>		
Asset Turnover Ratio	$\frac{\text{Gross Revenues}}{\text{Average Total Assets}}$	Monitor Increasing Trend Over Time

Operating Expense Ratio	$\frac{\text{Total Operating Expenses} - \text{Depreciation/amortization Expense}}{\text{Gross Revenues}}$	
Depreciation Expense Ratio	$\frac{\text{Depreciation/amortization Expense}}{\text{Gross Revenues}}$	
Interest Expense Ratio	$\frac{\text{Total Interest Expense}}{\text{Gross Revenues}}$	Generally $\leq 0.15:1$
Net Income from Operations Ratio	$\frac{\text{Net Income from Operations}}{\text{Gross Revenues}}$	
<i>Measures of Repayment Capacity</i>		
Term Debt and Capital Lease Coverage Ratio	$\begin{aligned} & \text{Net Income from Operations} \\ & + \text{Non-farm Income} \\ & + \text{Depreciation/amortization Expense} \\ & + \text{Interest on Term Debt \& Capital Leases} \\ & - \text{Income Tax Expense} \\ & - \text{Withdrawals for Family Living} \\ & \text{Annual Scheduled Principal} \\ & \text{and Interest Payments on Term Debt} \\ & \text{Capital Leases} \end{aligned}$	Value Greater Than 1:1 Monitor Increasing Trend Over Time
Capital Replacement and Term Debt Repayment Margin	$\begin{aligned} & \text{Net Income from Operations} \\ & + \text{Non-farm Income} \\ & + \text{Depreciation/amortization Expense} \\ & - \text{Income Tax Expense} \\ & - \text{Withdrawals for Family Living} \\ & = \text{Capital Replacement and Term Debt} \\ & \text{Repayment Capacity} \\ & - \text{Principal Payments on Term Debt} \\ & \text{and Capital Leases} \end{aligned}$	Monitor Increasing Trend Over Time

References

Oltmans, Arnold W., Danny A. Klinefelter, and Thomas L. Frey. *Agricultural Financial Reporting and Analysis*. Doane Agricultural Services Company. 1992.

Farm Financial Standards Council. *Financial Guidelines for Agricultural Producers*. 1995

Sydney C. James, Stoneberg, Everett. *Farm Accounting and Business Analysis*. The Iowa State University Press, Ames, Iowa 50010. 1986.

Dennis A. Kaan, Hewlett, John P. *Western Integrated Ranch/farm Education Financial Management*. Department of Agricultural Economics, University of Wyoming, Laramie, WY 82071. November 1994.



Managing for Today's Cattle Market and Beyond

Applying the Assessment Tools to Your Farm/Ranch

by
A. Lee Meyer, University of Kentucky
John P. Hewlett, University of Wyoming

Can you survive this economic crisis in the cattle industry? Not everyone will, but many of those who work hard at identifying their weaknesses and responding with sound management strategies will survive and be positioned to be profitable in the near future. If you are like most of us, economic and financial tools can seem too abstract to be useful. We think we can convince you that these are tools that you can get comfortable with if you'll just follow along with our two case examples. We've pulled together data from two farms - and we think that at least one of them will help show you how to use the financial toolbox on your place.

The materials in this series have suggested and described tools for determining the status of the cattle enterprise on farms and ranches. The authors have developed a broad range of tools focusing on financial and economic measures, as well as production measures. These tools include: liquidity/cash flow, debt:asset ratios; net worth; profitability; unit cost of production; calf death loss; percent calf crop; average weaning weight; pounds of calf weaned per female exposed.

How does your farm stack up by these measures? To help you understand how to apply these tools to your particular situation, we are going to use example farms. One will represent a diversified farm of the Southeast. The other will be representative of a cattle ranch in the West. We think that by showing how these tools help these farms diagnose their strengths and

weaknesses, that you'll get a better understanding how to make these practical tools that fit your situations.

There are two issues which must be addressed first - data and benchmarks. If you really want to be able to analyze your situation, you will need good information about the details of your operation. Many farmers have decided that they need a whole set of records to effectively manage their operations - regardless if times are good or bad. This is the top management situation. These operations will have financial records for their whole farm and enterprise records covering both economic and production measures. Many states have developed specific programs oriented around management based on records. IRM (Integrated Resource Management) teams exist in several states. The CHAPS (Computerized Herd Appraisal Program) is another program, which focuses on production measures.

These programs not only benefit the direct participants, but are also helpful to all producers by establishing standards, benchmarks and averages. The National Standardized Production Analysis (SPA) Guidelines has set standard definitions that are used around the country, so we can finally make comparisons. For example, many are measuring breeding efficiency by the same rules.

Unfortunately, most farms do not have complete sets of economic and production records. However, with a little work, managers of many of these farms can put together some of the records they need for at

least a basic self-appraisal. Everyone must keep tax records. An inventory of land, equipment, facilities and estimated market and book values can be used to develop net worth. Debt (net balances) can be obtained from lenders and should be on loan statements.

Production records may be more difficult to calculate. Sales records will be a starting point for many operations. The number of head sold, by category and average weight is a key figure for production. If you did not keep a record of the number of females exposed to your bulls, now is a good time to start. You may be able to estimate the breeding success by taking an inventory of the number of cows that you have now. Then go back and try to remember what happened between now and the last breeding season. Did you cull three open heifers and sell them as yearlings? If so, they were part of the number of females exposed.

When estimating (or filling in records gaps), remember to be as accurate as possible. A bias - in either the good or bad direction, may lead to a bad management decision. It is better to leave a piece of information out if you can only make a rough (without any data or records) guess. When a critical decision is being made, go back and check the basis for your decision and make sure that you are confident that you can live with the information and the decision.

Two Typical Situations

The western case ranch is assumed to be running 311 cows and is operated by the owner/manager and one full-time employee. Ranch enterprises include native hay, dryland alfalfa hay, antelope and mule deer hunting (trespass fee only), and cow/calf production.

Total AUs (Animal Units) utilized on this ranch equal 369, generating 274 calves - 210 sold (134 steers at 500 lbs. and 67 heifers at 480 lbs.) and 67 retained each year. Total revenues are assumed to be \$123, 768 with calf sales contributing \$98, 091. Total expenses on an accrual basis are \$116, 493.

The southeastern case farm is a diversified, family-based operation with about 300 acres. Part of the farm has been in the family for three generations, but several years ago 85 additional acres were purchased. Last summer 46 females were exposed to the bulls and 33 calves were sold at weaning. The farm has a mix of crop enterprises including hay and grains. The mix of crops changes from year-to-year, according to rotations and market situations.

The cattle enterprise uses 180 acres of pasture/hay land. Cows are bred for spring calving, with calves sold at weaning in the fall at a local auction sale. Last

year, the average weaning weight for steers was 450 pounds. Of the 20 heifer calves, the seven best were kept as replacements and the remaining 13 were sold, at an average weight of 400 pounds. Cows are wintered on hay and grain produced on the farm.

Total revenues for the southeastern farm were \$40,040 last year, with \$8,540 coming from the cattle (calf and cull cow sales). The cattle contributed about 21% of the gross. Total expenses from all the enterprises were \$23, 253.

Calculating the Performance Indicators

The following pages include the calculated financial and performance measures for the two case farms. All of these measures are calculated with normal farm records. Other publications in this series describe these measures in more depth. You may also want to consult with information sources for help - including your accountant or tax preparation specialist. For each of the measures, the calculation is described following the term. Then the calculations are done for the two case situations.

Financial Measures:

Liquidity/Cash Flow:

Current Ratio: Ending Current Assets @book value/Ending Current Liabilities

West: $\$259,017/115,921 = 2.23$

Southeast: $\$128,432/39,640 = 3.24$

Net Cash Flow:

West: \$8,073

Southeast: \$16,786

Solvency:

Debt:Asset Ratio: Ending Total Liabilities/Ending Total Assets @ book value

West: $\$227,964/1,016,665 = 0.22$

Southeast: $\$149,302 / 481,620 = 0.31$

Net Worth: Ending Total Assets @ book value - Ending Total Liabilities

West: $\$1,016,665 - 227,964 = 788,701$

Southeast: $\$481,620 - 149,302 = 332,318$

Change in Net Worth: Ending Net Worth - Beginning Net Worth

West: $\$788,701 - 781,408 = 7,293$

Southeast: $\$332,318 - 317,869 = 14,449$

Profitability: Net Income (accrual basis)

West: \$ 7,293
 Southeast: \$14,449

Cost of Production:

Feed Cost per cwt. of calf sold: Total Feed Costs/Total Cwt. of Calf Sold

West: \$15,362/992 = \$15/cwt.
 Southeast: \$ 5,112/142 = \$36/cwt.

Total Cost per cwt. of calf sold: Total Costs/ Total Cwt. of Calf Sold

West: \$100,166/992 = \$101/cwt.
 Southeast: \$ 11,786/142 = \$ 83/cwt.

Production Measures

Calf Death Loss: (Number of Calves which Died/Number of Calves Born) X 100

West: 6/274 = 2.19%
 Southeast: 1/41 = 2.4%

Percent Calf Crop: (Number of Calves Born/Number of Exposed Females) X 100

West: 274/311 = 88%
 Southeast: 40/46 = 87%

Average Weaning Weight: Number of Pounds of Calf Weaned/ Number of Calves

West: 131,320 / 268 = 490 lbs.
 Southeast: 17,500 / 40 = 425 lbs.

Pounds of Calf Weaned per Exposed Female:
 Total Number of Pounds of Calf Weaned/Number of Females Exposed

West: 131,320 / 311 = 422 lbs.
 Southeast: 17,000 / 46 = 370 lbs

What Does this Mean?

Liquidity refers to the ability to meet cash expenses and payments as they occur. The most simple situation is when there is plenty of cash in the bank to cover current expenses, such as feed, veterinarian, repairs, etc. Other sources of liquid assets include receivables, certificates of deposit, etc. Based on the two measures of liquidity - the current ratio and net cash flow both of our farms seem to be in good shape. A current ratio greater than 2.0 implies financial strength. Both pass this test. A ratio of less than 1.0 would be a danger sign. That would imply that expen-

ditures would exceed ability to pay easily. Perhaps payments could be made by borrowing, but that would imply that a problem exists.

Based on net cash flow, both farms also appear sound. But, this is where more detail would be helpful. Since the southeastern farm is several diverse enterprises, it is important to identify the farm's strengths and weaknesses. A deeper look (not shown in this example) would show only a \$1,502 net cash flow for the cattle enterprise. Further analysis would show that another drop in cattle prices would push the cow/calf enterprise into a negative cash flow situation.

The purpose of Solvency measures is to focus on the long-run financial stability of the business. If the farm was to be sold, would the total value of the assets cover all of the debt? Most farmers and ranchers are familiar with this term - Net Worth. A related term is 'Debt:Asset Ratio' which focuses on the balance between debt and resources. In simple terms, this is the percentage of the farm/ranch which is debt-financed. Because solvency focuses on the longer run, it is helpful to monitor change in net worth. By keeping track over several years, it is easy to identify positive or negative trends and head off problems before they get too serious. The last solvency measure is profitability - which means that the operation covers all of its costs, including land, labor and management.

A debt:asset ratio below 40% is considered strong, while one greater than 60% is a danger signal. Both case farms are strong by this measure. Farms and ranches, especially those which have been operating for some years, typically have strong debt:asset ratios because of the land value.

Based on net worth and change in net worth the two case examples are also sound. But it is important to monitor changes and the basis of the net worth. If net worth is increasing because of asset appreciation, there would be cause for concern.

Cost of production is the last measure to be discussed. Here is where some problems are starting to identify themselves. Based on the feed cost, there appears to be no problems. But when total cost per cwt. of calf sold is examined, there is a problem. For both the western ranch and the southeastern diversified farm, cost of production exceeds market price. The reason that this indicator shows a problem, while the others do not, is that this indicator focuses specifically on the cattle enterprise. Under conditions of high feed costs and low sale prices, the cow/calf enterprise is faltering.

There are other measures which could be used to diagnose the health or illness of these farms. An

investor might want to examine the rate of return on equity. There are also production indicators which are important. Four of those have been calculated for these farms to be used with other publications in this series, but will not be directly discussed here.

Summing Up

If you were now to inherit the management of these two operations, would you be content with the situation that you inherited? Both operations are not facing liquidity problems, they can pay their bills on time without going to the banker for a loan. But there are hints that the cattle enterprises may be a problem. A red flag has been identified which should be examined closely. Given the strong equity positions of both operations, there is no reason to believe that they can't survive. But, unless the cattle situation can be improved through better management or revitalized markets, the net financial status of these farms may slowly deteriorate.