

Remodeling Your Production System

Derrell Peel, Oklahoma State University
John D. Lawrence, Iowa State University

Production systems developed and optimized with \$1.25/lb calves, \$2/bu corn, \$40/ton hay, \$30/acre pasture rents and \$150/ton nitrogen need to be re-evaluated in the light of higher input costs and cheaper calves. Economic returns to cowherds depend on both revenue and costs. Both of these depend on your production system and most if not all the pieces interact within the system of production, marketing and management. Following an overview of the economic implications of changing market conditions, we discuss a few of the critical factors that producers should evaluate and before deciding to remodel their system.

Economic principles of changing prices

Assuming that the overall goal of a cow-calf operation is profit maximization, perhaps with some constraints or related objectives, there are several economic principles that guide how producers should respond to changes in values of production and input costs. Decisions about optimal production levels and input use are obviously related as changes in output are necessarily related to changes in input usage. The overriding economic concept is that the profit maximizing level of production is determined by the relative prices of products (output) to inputs. Thus, for any initial values of calves, there is a profit maximizing level of calf production that depends not only on the value of calves, but also on the values of fertilizer, hay, fuel, labor and other resources needed for production. This leads to several economic implications that producers should evaluate when values of outputs and inputs change.

First, when the value of outputs (or products) falls relative to input prices, the profit maximizing level of production may be smaller. In other words, it may simply not be worth producing as much if the value of the calves decreases relative to the price of hay, fertilizer, etc. Remember that the relative value of production can decrease because of a decrease in output price, an increase in input price, or both. Obviously, the profits will be lower, but the least impact may occur by decreasing production and thus decreasing input usage. For example, extremely high fertilizer prices may imply that the best decision is to simply accept lower forage production due to reduced fertilizer use and keep fewer cows with an increased stocking rate. For most producers, this concept must be evaluated in light of other considerations as well. Cutting production of a less profitable enterprise must be balanced against the overall financial implications of maintaining the business, and since most producers have a long-term investment in land and other resources, what will those resources be used for if not for cow-calf production. Nevertheless, the concept is valid and should not be ignored. Changes in market values for products and resources is the mechanism by which markets tell producers to adjust and the economic pain will be greater if you do not adjust.

A second economic concept related to profit maximization is the need to adjust between production alternatives when relative product prices change. This relates to the previous section in that when the profitability of an enterprise decreases and the producer has an incentive to reduce production, there is necessarily a simultaneous incentive to increase production of alternative outputs. In the case of cow-calf production, this leads to consideration of the choices between maintaining maximum weaned calf production and the possibility of decreasing cows and using some resources for retained ownership. Certainly high grain prices have created more incentive for feeder cattle to be placed into feedlots at higher weights for finishing. Once again, the extent and manner that a producer will respond to this economic concept will depend on individual circumstances, including the type of resources available, management and labor considerations and local marketing alternatives. Changes in relative output values implies the need to change the mix of products produced to minimize the economic consequences.

Finally, changes in relative input values suggest the need to change the amount and intensity of input usage. As noted above, an increase in the cost of an input implies overall that less of the input should be used and may imply a consequent decrease in production. However, to the extent possible, producers have an incentive to seek out alternative inputs and to adjust input usage based on the marginal value of the level of input used. For example, most producers have several choices about the type of fertilizer and alternative feed sources. Changing forage, feedgrain and protein feed prices implies a need to critically evaluate feeding programs and may imply very different rations for supplemental feed. It is important to remember that this concept implies a need to target adjustment appropriately. For example, high fertilizer prices do not mean that all pastures should get an across-the-board decrease in fertilizer. Rather, the optimal adjustment is likely to target fertilization to the most productive pasture and hay meadows and use less fertilizer in more marginal fields.

The above concepts provide the proper framework for producers to consider the kinds of adjustment needed in changing market conditions. However, the difficult task of determining exactly the magnitude of those adjustments is specific to each operation and can only be determined with careful and comprehensive analysis. It can be done with a pencil, a calculator and a Big Chief tablet, but there are also a variety of decision aids, software tools and resource information available through Cooperative Extension and other sources.

Is it time to remodel?

The first step in remodeling a house is to objectively determine what stays and what has to go. Next, develop a plan, get estimates and determine what is most important because you can't do it all. Finally, get a timeline for completion and determine who is responsible for which task. Remodeling your cowherd is similar. You must first assess your current system to determine what you are doing well and what needs improvement. Next, prioritize the things that need to change and identify what one to three things you are going to tackle first. Finally, develop an action plan about how and when the changes will occur and who is going to do each step. Even though you may be the owner, manager and sole source of labor, other people may be involved in the steps to make the change.

For example, implementing rotational grazing may involve working with NRCS for EQIP cost share, the contractor to run water lines, the electrician to run power to the waters and fencer, farm supply store to order and deliver posts, fencer, wire, gates, and waterers, etc. The point is that a plan with a timeline is important to remodeling.

Dr. Harlan Hughes, North Dakota State University professor emeritus, emphasizes unit cost of producing a cwt. of calf (UCOP) as a variable with the highest correlation to herd profits. UCOP is the ratio of the total costs to run the cowherd divided by the herd's total pounds of calf produced, adjusted by non-calf income. To lower UCOP, you can either lower the total costs of running that cowherd, increase the pounds of calf produced, or both. According to Hughes, most ranchers tend to lower UCOP by increasing pounds of calf produced. However, this production comes with a cost and it is important to keep costs in mind as you work to increase production.

The following discussion raises questions to consider as you assess your operation. It is broken into revenue and costs and while some factors are beyond your control, others can be managed to improve your net returns, reduce your risk exposure or both. We will also identify additional resources that provide more information on the topic and/or benchmarks for evaluating yourself. The list is not exhaustive and the benchmarks are not meant to be a pass or fail grade, but rather a place to begin evaluating your operation.

Revenue

Beef cowherd revenue comes from the sale of calves and cull breeding stock and is based on pounds and price. Cull breeding stock are often sold based on convenience. That is, open or lame cows are sold at weaning because that is when it is convenient to sort her off for sale. There is a strong seasonal pattern in cow prices from a November low to a February-March high. Feeding cull cows through the winter has traditionally been profitable, but needs to be re-evaluated in an era of higher feed costs. Given the cost of developing replacement heifers, a late bred cow that will fit someone else's fall calving herd may also increase cull revenue.

Revenue from calf sales can be managed, but involves tradeoffs and may require additional investment, skills and risk. Selling heavier calves will increase revenue and will increase profits as long as the cost of added pounds is less than the value of the added pounds. Weaning heavier calves or from a higher percentage of cows exposed is easier said than done and is often a function of genetics, cross-breeding, calving date, cow nutrition, calf nutrition, calf health, and other factors.

The 2005 Standardized Performance Analysis (SPA) records cooperators had an average weight of feeder cattle sold of 497 lbs. and average calf weight sold per cow was 453 lbs. Hughes offers a goal of 500 lbs., but notes that in 2005 herds that he reviewed averaged 406 lbs. Another often cited goal is for a cow to wean 50% of the cow weight. SPA cooperators sold breeding stock weighing 1282 lbs. making a goal of 640 lbs. for calves. What do your cows weigh and what weight of calves do they wean?

An alternative production system to selling at weaning is to precondition calves to a heavier weight after weaning. Feeder cattle prices decline as weights increase so adding pounds increases revenue. Seasonally, feeder cattle prices increase from October to February, but in some years prices do decline.

So there is market risk to preconditioning. The decision to precondition calves depends on your resources (feed, facilities, skills) and market conditions at the time. Budgets to help evaluate the decision are available at <http://www.extension.iastate.edu/agdm/>.

Preconditioning can increase selling price as well as pounds. Recent research of Iowa feeder cattle auctions showed that weaning and vaccination increased the selling prices of calves all else equal. However, proof of vaccination and weaning by using the third-party verification of the Iowa Green Tag Preconditioning program with the signed certificate nearly doubled the premium (<http://www.iowabeefcenter.org/content/IBC30.pdf>). Do you precondition calves before selling them? What is your average daily gain? What is the cost of added gain?

Managing price risk can help a cowherd achieve their price goals. Futures and options are available, but their 50,000 pound contract size is often too large to be practical for many cowherds. Livestock Revenue Protection (LRP) is a price insurance tool that provides a price floor without a price ceiling. It has flexible contract size and has a built-in basis adjustment for calves weighing under 600 lbs. What is your strategy for managing price risk?

Although market prices are beyond your control, you do determine the when and what you sell and whether you protect a price. You also impact the weight, condition and quality of the cattle you sell. How are you doing? Are you getting the revenue and price you want? For the same weight of calves are you getting above the average price for Iowa? You can find the prices at http://www.ams.usda.gov/mnreports/nw_ls795.txt.

Costs

Revenue and production are important profitability of a cowherd, and so are costs. The Iowa Beef Center has identified 12 factors that impact cowherd costs that are listed below. More detail on this list and an assessment tool to help you evaluate your own farm is available at <http://www.iowabeefcenter.org/managingfeedcosts.html>. The 12 factors are:

1. Reduce feed waste
2. Enhance pasture productivity
3. Test forages for ration formulation
4. Split herd by cow age and condition
5. Minimize capital investment
6. Maximize corn stalk grazing
7. Watch operating costs
8. Use superior genetics
9. Time calving season
10. Use effective herd health management
11. Improve cull cow marketing
12. Consider retained ownership

Each of the items are influenced by your production system, but before you can determine if you should remodel some aspect of your system you must assess how well you are doing on that factor. The assessment tool provides criteria to help you determine if you are above or below average on each of the 12 factors listed.

Feed is the largest single cost factor to manage, representing about 60% of total costs (Table 1). Feed costs are typically divided into grazed and harvested feed. Operating, labor and fixed costs are the remaining costs. The total costs and share represented by each category will vary with feed prices, inflation and individual production systems.

Table 1. Distribution of Iowa SPA Cowherd Cost of Production 2000-2004 Average.

| | Financial | Economic |
|--|-----------|----------|
| Total Feed Cost per Cow | 63% | 58% |
| Pasture Cost per Cow | 22% | 24% |
| Crop Residues per Cow | 1% | 1% |
| Harvested Forages per Cow | 19% | 19% |
| Non-Purchased Raised Feed Fed per Cow | 8% | 5% |
| Purchased Feed per Cow | 13% | 9% |
| Operating Cost per Cow | 20% | 14% |
| Depreciation Cost per Cow | 12% | 8% |
| Capital Charge per Cow | 2% | 8% |
| Hired Labor Cost per Cow | 3% | 2% |
| Family & Operator Labor Charge per Cow | 0% | 10% |

The SPA summary also provides a benchmark with which you can compare your herd. Because so few producers participate in cost of production records programs, the most recent SPA summary is from 2005.

http://www.iowabeefcenter.org/content/economics_biz_cow-calf_mgmt_spa.html The dollar values are out of date due to price changes, but the physical values (pounds, tons, acres) are still valuable criteria.

Managing pasture productivity and costs are essential to profitable beef cowherds. Soil type and rainfall are given, but forage selection, fertility, weed control and grazing system are choices made. A recent IBC publication identifies 10 factors to improving pastures <http://www.iowabeefcenter.org/content/feedlot/2008/grassproduction.pdf> . Rotational grazing pastures interseeded with legumes is a proven management tool that increases cattle production per acre, reducing pasture cost per pound of calf produced. Compared with a continuously, and abusively grazed pasture, implementing grazing management along with fertility and other pasture management practices, productivity will be increased by 25% to 50% in the first year and up to 100% by year three. How many paddocks are in your rotation?

Are you matching your cattle to your feed resources most efficiently? More specifically, do your calving and weaning dates and cow size make economics sense for your farm?

We discussed weaning weight in the income section, but if cow size has increased to get heavier calves so have your feed needs. If your calving date has moved earlier to get heavier calves, but you are using a large amount of stored feed for lactating cows, your feed needs have increased. If you delay weaning to get bigger calves, but cow condition is pulled down to the point you have poor conception or you have to add condition scores with harvested feed, your feed costs have increased.

Controlling harvested feed costs is multifaceted. Harvesting requires investment in equipment and perhaps storage, but allows producers to match forage supply with feed demand. Hay waste during storage and feeding can be significant - 30% to 50% - but can be managed. How much feed do your cows need to maintain condition in the winter? How much feed do you deliver to your cows? How much feed do you harvest for your cows? The difference in these numbers is feed waste, and you can't manage what you don't measure. Do you record feed inventory before and after the feeding season? Do you know what your bales weigh?

Summary

Cowherd costs have increased in recent years at the same time calf prices have decreased. Production and marketing decisions that worked well in previous years may not be optimal in the new economic environment. The place to start is with an assessment of what you are doing now to identify what is going well and what needs improvement. There are benchmarks and goals to compare your operation to determine where to start.