Factors to Consider When Making Economic Decisions in Larger Grazing Operations

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Introduction

Padlock Ranch Company is a diversified cow-calf, farm, and feedlot operation. It is a multi-generational family business that started in the 1940s by the Scott Family. The family still owns the ranch today. Our operations span from Ranchester, Wyoming, on the south to Hardin, Montana, to the north. The cow-calf enterprise is managed extensively with year-round grazing of mostly mature cows. We calve in May and June and wean calves in the fall of the year. Weaning depends on feed and cow conditions, but usually occurs in October and November. Calves are weaned into a grow yard near Dayton, Wyoming. Irrigated and dryland farm ground support the cow-calf and feedlot enterprises. Farm production includes corn silage, haylage, alfalfa and grass hay, hay barley, and barley grain. Corn silage, which is grown under center pivots, makes up the base of calf-growing rations. Calves are grown to weigh approximately 800 lbs and are typically shipped as yearlings in the spring of the year or held over as replacement heifers. Most yearlings are sold but retained ownership to finish is always an option if market conditions warrant. The feed yard is also used to add weight and value to cull stock animals.

The ranch is managed to fulfill five interrelated purposes. In other words, success depends on achieving balance across the purposes and fulfilling the goals in each area. The five purposes that provide this framework are: 1) financial excellence, 2) excellent people, 3) natural resource sustainability, 4) positive member of the community (local and national), and 5) to be an emblem for the Scott Family.

With this background, this presentation will look at some of the key factors that we consider in making important economic decisions in this business. This is certainly not an exhaustive list, and like the elements of purpose that govern our business, they are interrelated. We will consider three primary factors that we consider in making decisions: 1) efficient and correct use of the natural resources, 2) costs and cost/benefit considerations, and 3) system integration.

Efficient and Correct Use of the Natural Resources

We look at the health of our grassland resources as being essential to our business success. We want to see a diversity of plants, little bare ground, deep root systems, and functioning nutrient cycles. We look for healthy riparian areas and thriving wildlife populations. With the health of our rangeland in the forefront, being appropriately stocked is very important. Overstocking can destroy the resource and the potential for future productivity. Understocking, on the other hand, is detrimental to profitability.

Costs in a business are broken into fixed and variable costs. Variable costs change with changing production units, like the number of cows. These include vaccine, feed, vet charges, sometimes labor, etc. Fixed costs are those expenses that do not change, such as land costs, equipment costs, financing charges, labor in many operations, etc. If you think of an industrial factory, throughput reduces the cost of producing a product because the fixed costs are diluted. Ranching is no different. Turnover, or the amount of product or products being produced on a

given resource, is very important in diluting fixed costs. The economics of cow-calf production mandate cost control for long-term profitability to be achieved. So, the efficiency by which resources are used, such as land, is critical to profitability. Matching stocking rate to carrying capacity for optimum business efficiency is a high leverage area. It is important to remember that stocking rate is the number of animals multiplied by time for a given amount of land. You can manipulate stocking rate by the number of animals or by the time they spend on the land. There are some factors that have marked impacts on how efficiently land can be used. These include grazing management, water, duration of grazing, season of grazing, stocking density, and cost of implementation.

There are many different grazing systems that can be implemented, ranging from very intensive to very extensive. At Padlock, our goals are to: create periods of rest for range plants to recover, not have growing plants bitten multiple times, and leave appropriate residue for adequate litter and ground insulation, etc. We also have to manage our labor costs in the process. Most of our cow units run approximately 2000 cows with 2-3 full-time people overseeing the management of those cows. Since cow-man ratio is very important in what our cost per weaned calf will be, this factor is considered in designing the system. We use what we call planned and timed controlled grazing. We run cattle in larger groups (typically 750-1000 hd) and rotate them across a series of pastures. The duration in each pasture varies with size and season of use, but we put emphasis on minimizing growing plants being bitten more than once. The early growing season is a critical time, so duration in pastures is typically shorter in the spring/early summer and can be longer after plant dormancy. In some operations, managers can run cows in small paddocks and move them daily or every few days. This may be ideal to avoid overgrazing growing plants and creating longer periods of rest. We look for balance between ideal range management and ideal cost management. We may be in pastures early for periods of 2-4 weeks, which is certainly better than season-long grazing. This is especially true when the season of use is varied across years. Many of the pastures that are grazed in May and June can be grazed again later in the year, since the cattle were moved based on timing and not removal of biomass. These pastures can also be rested the remainder of the year in consideration for the next year's grazing or pasture renovation.

One consideration in our system is that we calve in May and June, a decision made to reduce winter feed costs. May and June calving coincides with the time of year we want to be moving faster through pastures. We want to accomplish this with as few people as possible and keep calves paired up with cows. This requires patience in moving cattle as well as skilled employees. The May calving combined with our desire to keep labor costs down makes high-intensity and very rapid movement schedules difficult. In the grazing system, science, art and economics intertwine.

Cross fencing has been a tool that we have used to reduce pasture size and allow us to better manage duration and rest in pastures. A pasture that is 5,000 acres may easily run a group of cows for a month. We may need to be in that pasture for a month to let the other pastures grow and to get to the end of the season. By splitting that into two pastures of 2,500 acres, we can be on each side for two weeks, thus reducing overgrazing on growing plants and still accomplishing the time we need. A benefit is that with the added rest, range conditions improve and thus carrying capacities are increased. We have found that fencing does not have to be elaborate. We

use both single- and double-strand electric fence for cross fencing. It is easily moved if needed, and keeps costs down. We had to get past the paradigm that all fences had to be absolutely impermeable. This has worked really well for us.

In many areas, water is the limiting resource, not grass production. We have worked continuously to develop water where it is possible. We have drilled wells and put in multi-tank water systems. We have added storage and stock tanks to existing wells. Fencing reservoirs and putting in a siphon stock tank system has allowed some reservoirs to extend further into the season. We have recently been installing solar systems to improve on efficiency. Most of these projects are expensive, but we have made it a priority to invest in these capital improvements over time as finances allow. We have also looked at an inventory of our overall resources and allocated areas that are poorer in water quantity and quality for winter grazing. Dry cows in the winter need less water than lactating cows in the summer. In our system, our poorest water is in areas with minimal pine trees and rolling hills that expose feed even when there is snow. We provide water to the cows, but they can use snow as part of their water requirement. We have areas that are more suited for summer, with live water and mountains with pine trees. These areas are stocked for full grazing during the summer, and the cattle are moved to the poorer watered areas in the winter. This has improved our utilization, as we can get grass to be grazed in the winter that would be difficult to remove in the summer due to water limitations.

All of these factors contribute significantly not only to rangeland health, but overall economic efficiency.

Costs and Cost Benefit Considerations

The importance of cost management was mentioned above. The first step in cost management is having an understanding of what production costs are. We use an accrual enterprise system that tracks actual cost by unit, crop, livestock type, etc. When we know what our cost per calf and cost per bred heifer really are, we can begin to look for the leverage points in managing these costs. Depreciation is a large cost. Livestock depreciation, which is the cost of replacement females depreciated to a salvage value over time, can have significant influence on financial performance. We have had success in developing heifers on rangeland during the winter in Montana. We have demonstrated over multiple years that we can winter heifers with modest amounts of supplement (2-3 lbs of protein supplement) and no hay, while reducing variable costs and achieving reproductive success. In 2015, we had 1,093 heifers developed on range (beginning early January) compared to 1,026 developed in the feedlot. Harvested or purchased feed costs were $1.00/hd/day less for the range developed heifers. Pregnancy rates the following summer were similar, with range and feedlot developed heifers breeding up at 86% and 87%, respectively. These heifers were bred for May calving. It is important to look at the whole system when evaluating data like this. The question is how to value the rangeland grass? We have used grassland opportunistically to winter heifers. In other words, we have range developed heifers when we have available grass to do so. To do this consistently, we would need to 1) lease or purchase more grass, 2) reduce the number of cows, 3) or feed cows rather than heifers. There are cost considerations in all three of these options. Fewer cows would mean less dilution of overheads. Feeding cows hay to free up grass for calves would increase the variable costs associated with running the cow. Both would contribute to an increase in the

cost/calf weaned. This has to be balanced with the reduction in depreciation costs over time by a less expensive heifer development program. Based on this, we winter out as many heifers as we can, but have not changed our cow numbers or cow system to accommodate doing this every year. There are other considerations like whether range developed heifers will become better cows. We are monitoring this, but have no conclusive data to report at this time.

Another consideration is longevity in cows as it relates to management of young cows. Using net present value (NPV) can yield information regarding the leverage of longevity. An NPV value gives an estimation of net cash flow (revenue from calves and cull cows) less the expenses beginning in a particular year throughout the productive life of a set of cows. This value is discounted to account for the time value of money. So, if you start with 100 bred heifers and have an 80% pregnancy rate on two-year olds with no culls, there would be 80 three-year-old cows the next year, and so on. As I reported at the Range Beef Cow Symposium in 2015 (Patterson, Proc Range Beef Cow Symposium XXIV, pg 91-96), I modeled the NPV of a set of 100 bred, coming two-year-old cows using two reproductive scenarios (Table 1). In scenario 1, I assumed two- and three-year-old pregnancy rates at 88%. I assumed "running" age (four through 10 years old) cows had a pregnancy rate of 93%, with that tapering off at age 11, and all remaining cows culled at age 13 (not many left by that age; see Table 1). I used five-year average 550 lb calf prices and cull cow prices. Our approximate current cow cost was used and then inflated 3% per year over the life of that set of cows. I then calculated the NPV of the two-year-old. In the second scenario, I used 75% for the pregnancy rate on two- and three-year-old cows. That is all I changed. It changed the average age of the set of cows over their lifetime from 5.6 years in scenario 1 (88% young cow pregnancy rate) to 5.3 years in scenario 2 (75% young cow pregnancy rate). The absolute values are not what are important, as that varies with the assumptions on markets and preg/cull rates on the base cow herd. What is important is the relationship. The cows in scenario 1 had an NPV of $1821/hd vs $1611/hd in scenario 2. So, the modest change of 0.3 years average cow age affected by young cow reproduction changed the lifetime value of the cows by $210/hd. That has direct implications to the bottom line of a ranching business. Young cow reproduction is important, and these data tell us that while we can put fewer resources into developing heifer calves, once we get them bred, we should consider spending some money to keep them bred as young cows. When wintering bred cows pregnant with their first or second calf, we spend more money than on the rest of the cow herd. Only three-year-old cows in good condition are turned out on winter range, and they are run with less grazing pressure than older cows. We feed some hay to thin and young cows, especially bred heifers. The data suggest that we can afford to do so.

We can also use cost data to help determine whether certain areas are points of leverage for us or not. For example, we operate on both leased and deeded land. Our leasing costs are rising on some land we operate on within the Crow Indian Reservation. Looking at individual leases that are bid on a per acre basis, we question whether we can afford to bid the amount necessary to obtain them, as the cost per unit that these leases will run is too high. However, if we look at the effect of increasing lease payments on the Reservation as it affects our overall calf cost, it is not as significant as we thought. A 60% increase in the cost of Reservation leases in our system would increase our overall calf cost by 6.9%, and those costs would still leave some margin for profit. So, while the increase seems drastic, when the leased Reservation land is leveraged against the deeded land that we have, we found we can afford to pay more for strategic leases

that are important to our operation. It is important to understand these relationships when making decisions.

System Integration

It is important to look at the how the system all fits together when making decisions. For example, when we cull young cows from our system, we look for ways to add value to those cows. Young and open cows are exposed for fall calving and sold as bred cows in the spring. These are young cows that just got behind in our system, and they can make a good replacement for a fall calving herd. We have repeat buyers for these cows. Our customers can buy a replacement cow cheaper than they can build one, and we can sell a cow for more than weigh-up prices. To manage stocking rate, we cull on older bred cows as necessary to keep our cow numbers where they need to be. These cows are sorted and classed up to be sold as short-term cows. This is another example of a win-win program for both parties involved.

The best examples of system integration are when cost can be lowered and revenues simultaneously increased. Calving large numbers of heifers is laborious and expensive. In our system, we breed heifers to Wagyu bulls for May calving. These are artificially inseminated followed by a short clean-up period. The Wagyu calves are lighter boned and smaller at birth, which results in very little dystocia. Our heifers calve early on green grass. We ride through them once/day and do not use calving barns or large calving crews. The Wagyu calves are grown in our feedlot and sold on a basis contract to the semen provider at a premium. The contract is negotiated before the heifers are bred. This system allows us to lower our costs substantially while actually adding revenue and some risk management.

We ranch in an arid environment in the northern Rockies. Having an integrated system allows us to respond to drought, fire, severe winters, and downturns in markets. The grow yard gives the flexibility to sell calves at different times. The farm provides feed that can be used to manage through short-term challenges. For instance, we had an August fire in 2012 that burned over 80,000 acres of grass. We were able to early wean calves so that cows could be moved away from the burned area. The calves were sold at lighter weights and we used feed produced for the calves to winter cows. We used limit-fed corn silage rations to keep cow wintering cost reasonable. Given where cattle numbers were at that time and the imminent increase in cattle prices, our system allowed us to hold our cattle herd together. We then had our full factory in tact when record prices were achieved in 2014 and early 2015. System integration and the accompanying synergies give the flexibility to deal with changing circumstances and hold profits together.

Conclusion

There are many other important areas that could be discussed regarding considerations in making economic decisions. The factors discussed here are a few key areas with examples of how they are used in our business. The factors of 1) efficient and correct use of the natural resources, 2) costs and cost/benefit considerations, and 3) system integration are areas that we consider when making important strategic decisions.

Table 1. Cows and pregnancy rates used in a net present value model for two longevity scenarios.

	Avg Age 5.6 years		Avg Age 5.3 Years	
Age	# Cows	Preg %	# Cows	Preg %
2	100	**88**	100	**75**
3	86	**88**	73	**75**
4	71	93	51	93
5	62	93	44	93
6	54	93	39	93
7	47	93	34	93
8	41	93	29	93
9	36	93	25	93
10	31	93	22	93
11	25	90	18	90
12	19	85	14	85
13	7	80	5	80