



Herd Efficiency and Profitability

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Introduction

Raising beef cattle can be very rewarding. First, if you like raising cattle, maintaining your tie to the land, and seeing the product of your labors, it



can truly be satisfying to see young calves in the spring, watch them grow and progress. Second, there can also be a financial reward

when the calves are weaned and sold. However, the satisfaction of these two aspects may all depend on your herd's efficiency and profitability.

Cattle operations should be striving to improve both efficiency and profitability; some operations do this better than others. The first step to making any improvement on your operation whether that improvement is efficiency, profitability or both is to know where you currently stand. It is impossible to know where you are going if you don't know where you are at.

To know where you are at as an operation, records must be kept. These records should tell us three things: (1) where we have come from, (2) where we are at presently, and (3) where we are headed. These records should not only be kept on the herd as a whole, but it is also beneficial to keep records on individual animals where possible. Records must also be kept for everything that is bought or sold. Remember, if you don't sell it, then you buy it. It is absolutely crucial that operators

keep records of both herd efficiency and cash flows if they are interested in tracking profits and losses.

Efficiency

The first value that is required to begin examining herd efficiency is the number of females exposed, or the number of females that are given the opportunity to become pregnant through natural service, AI or embryo transfer. There are animals however where it may be beneficial not to expose to breeding because they will be sold as slaughter animals. Not breeding them will reduce costs.

The number of females exposed should include pregnant females that have been purchased or transferred into the herd, but should not include pregnant females that have been sold or transferred out.

Pregnancy Rate

The next critical value is pregnancy rate or the percent of cows that have become pregnant.

Pregnancy Rate = [(number of pregnant cows) / (number of cows exposed)] x 100

To obtain pregnancy rate it is essential to pregnancy test. In a recent National Animal Health Monitoring System (NAHMS) report, it indicated that cows are checked for pregnancy in only 20% of all U.S. beef herds each year. NAHMS also points out that 71.7% of herds over 200 head pregnancy checked annually. Thus indicating that about 60% of all beef cows in the U.S. are pregnancy checked (Hilton, 2013).

Some of the advantages of pregnancy testing have been pointed out by Stenquist and Sasser (2010):

1. It gives early warning of breeding trouble, such as infertility in males and problem breeders in females.
2. It makes it possible to rebreed or sell non-pregnant females.
3. It allows for separation and grouping of females as pregnant and non-pregnant, which provides opportunity for proper management (i.e., nutrition, culling, and so forth).
4. It makes it possible to guarantee pregnancy on females that are for sale.

Calving Percentage

Calving percentage is another valuable comparison. This percentage expresses the percent of full term calves to the number of exposed females.

Calving % = [(number of calves born) / (number of cows exposed)] x 100

Rasby (2013) suggests that calving percentage may be the most important production calculation that a cow/calf producer can record. Reiling (2011) echo's this and states that "it provides an indication of a cow herd's reproductive efficiency and management during gestation. If a herd's calving percentage is lower than expected, then a manager should begin searching for potential problems and make the necessary management adjustments. Some of these problems could be nutrition, fertility in either males or females or both, bull power, and reproductive diseases."

Calf Death Loss



on the number of calves born.

Calf death loss = (number of calf deaths prior to weaning) / (number of calves born) x 100

Calf death loss is another calculation that can aid a manager in gauging his calf management program. This value is based

There are various reasons that can cause the death of calves between calving and weaning. These could include predation, scours, pneumonia, and dystocia. Reiling (2011) cited a study conducted by the USDA-ARS Livestock and Range Research Laboratory in Miles City, Mont. This study of 13,296 calving's over a 15 year period showed "that a majority of calf deaths (57 percent) occurred within 24 hours of calving, and 70 percent of those calf losses were associated with dystocia." This 15 year study also revealed 6% of calf death losses were due to exposure to the elements (cold and wet conditions), and 13% of calves were lost due to disease (scours, pneumonia). This study shows the importance of calving ease traits, proper nutritional regime so that females have the necessary energy required for parturition, and a proper calf vaccination program.

Calf management has a large impact on profitability. Pregnant and lactating females have higher nutritional requirements thus increasing feed costs. Therefore, more pounds of calf are required to cover those feed costs. More importantly, higher death loss means fewer pounds of calf available to sell. For this reason it is imperative that a producer consults with his/her



veterinarian to ensure the proper vaccination program for their herd.

Weaning Percentage

Weaning Percentage is the number of calves weaned compared to the number of females exposed.

Weaning % = (number of calves weaned) / (number of females exposed)

This value is more general in nature since it takes into account both death loss and calving percentage. It is also an indicator of the herd's nutritional status and body condition score of cows at calving and breeding and thus overall reproductive efficiency.

Weaning weight is also an indicator of genetic makeup, mothers' milking ability, calf health, and overall nutrition of the calf.

Length of Calving Season

Length of calving season also is a very good indicator of reproductive efficiency and nutritional status of cows at calving through breeding. CHAPS (2014) benchmark data gathered from 91,414 cows exposed to bulls from 2008 to 2012 shows that 60% of these cows calved during the first 21 days and 86% of these cows calved during the first 42 days of the calving season. A tight calving season means greater uniformity among calves which can equal greater profitability, since feedlots prefer to buy and feed cattle of similar size and origin. This reduces their feed costs and spreading of disease.

Body Condition Scoring

Body Condition Scoring (BCS) your cattle strategically throughout the year can also indicate to an operator where his cattle are nutritionally and consequently reproductively. It has been shown that optimal body condition score at calving is 5-6. Bohnert and Cooke (2010) gave 3 reasons for calving in at least a BCS 5:

- To maintain good reproductive performance (shortened time to first estrous, improved first service, and overall conception rate),

- To ensure colostrum production is adequate, and
- To improve probability the calf is born healthy.

Table 1 shows the relationship of BCS at calving and breeding to pregnancy rate. Research has shown that total income of the cow herd increases relative to BCS (Kunkle et al. 1994). Table 2 illustrates the relationship between body conditions and total income of a cow herd. The table also indicates a decrease in the postpartum interval, increased calf ADG, increased weaning weight and increased pregnancy rate as body condition increases. The prices in table 2 are an average of steers and heifers from Sept through Nov of 2013 in each weight class of medium and large frame #1-2 feeder cattle (Livestock Marketing Information Center, 2014).

Table 1

Relationship of cow body condition score (BCS) at calving and during the breeding season to pregnancy rate (Kunkle et al. 1994)			
Pregnancy rate (%)	BCS		
determined at:	4	5	6
Calving	60	78	91
Breeding season	58	85	95

Table 2

Relationship of body condition score (BCS) to beef cow performance and income.						
BCS	Pregnancy Rate %	Calving Interval d	Calf ADG. Lb.	Calf WW. Lb.	Calf Price \$/100lb	\$.Cow Exposed ^a
3	43	414	1.6	374	\$ 197.56	\$ 317.72
4	61	381	1.75	460	\$ 179.59	\$ 503.93
5	86	364	1.85	514	\$ 168.65	\$ 745.50
6	93	364	1.85	514	\$ 168.65	\$ 806.18

^aIncome per calf x pregnancy rate.
Adopted from Kunkle et al. 1994

Profitability

There are many aspects of the business that can affect profitability. Many of the measures mentioned in this fact sheet deal with reproductive performance. On a cow calf operation the cows are your factory, if the cows don't reproduce that is money lost. We can also deduce that reproduction is

highly correlated with nutrition. Bridges et al. (2008) points out that approximately 55 to 70% of the cost of keeping a cow are feed costs. Some of the other costs can include breeding costs (bulls or semen), heifer development, calf health/branding expenses, and death loss.

The key to tracking profitability is accurately tracking income and expenditures. A good rule of thumb is; as an operation if you are not selling it then you are buying it. It is also very critical that the production records are integrated with the financial records. It is important to note that we can't expect our cow herd to make a profit if our spending is out of control or not related to production. On the other hand we also can't expect

to make a profit if our production efficiency is not at average or above national averages.

Burke Teikert (2013), retired ranch manager, consultant, and columnist for beef magazine has

pointed out some keys to ranch profitability. These keys include:

- **Cows per worker.** 800 to 1200 cows, or cow and yearling equivalency, per worker. That keeps labor, housing, equipment, and horse costs lower.
- **Acers per cow.** Adding fence and water may be cheaper than adding land.
- **Feed fed vs. grazed feed.** There are few situations where grazing more and feeding less won't be more profitable. Graze when possible and feed only when you have to.
- **Cut overhead to the bone.** It doesn't take very much equipment or many people to run a good sized ranch.

Ramsey et al. (2009) echoes some of the same points. First "Machinery and equipment ownership contributed to increased costs as expected without also increasing either production or profits". Second; "increased feed fed per cow did not translate into higher production or calving profits, but did increase costs".

On cow calf operations the cow pays for everything through the pounds. of calf that she can raise to weaning. All of the costs that are accrued must be spread out over the cow herd. Essentially, the cows that are not productive (do not raise a calf) and are not covering their portion of the costs.

There is great value in tracking the expenses of different classes of cattle separately since there can be significant management differences. For instance, replacement heifers must be managed differently than the mature cows since their nutritional requirements are different therefore

causing costs to differ significantly. There is also value in breaking down all costs to a per head basis so that you can compare with other producers of a similar size.

Pounds of Calf Weaned Per Exposed Female

One of the more useful calculations to a producer is the pounds of calf weaned per exposed female.

Lbs. of calf weaned per exposed cow = (total lbs. weaned) / (Number of cows exposed)

Reiling (2011) states; "This figure combines into one figure, the herd reproductive rate, calf death loss, and genetics for growth and maternal traits."

Cost Per Pound of Calf Weaned

Another calculation that can be very useful when measuring profitability is the cost per lb. of calf weaned.

Cost per lb. of calf weaned (breakeven) = (total lbs. of calf weaned) / (Total Expenses)

The product of this equation is the breakeven price of your calves. The difference between the price received and the cost per lb. of calf weaned is your profit or loss.

Conclusion

There are many different operations and managers, thus many different methods of tracking herd efficiency and profitability. However, to be able to compare your herd with those of the industry there must be a standard. The calculations mentioned in this fact sheet for efficiency and profitability meet the standardized performance analysis guidelines. In order to be profitable and efficient managers must track herd performance which in turn is also tracking management effectiveness. Furthermore, managers must also track income and expenses which will allow them to gauge their financial management skills as well as herd efficiency. The National Cattleman's Beef



Association has some free software available that can be very helpful in this area. This software can be found at the following web address.
<http://www.beefusa.org/spacalculationsworksheet.aspx>

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