

# IMPACT OF SEED STOCK SELECTION ON THE ECONOMICS OF A COW-CALF OPERATION

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The beef cattle industry in Florida continues to be an important segment of agricultural production. Florida continues to be the leading state in the Southeast in terms of beef cattle production and ranks number ten nationally in cow numbers. The first stage of beef production is cow-calf production which is important throughout Florida. This stage involves the production of a weaned calf which is conducted by cow-calf operators who breed cows to produce calves.

Profit margins are often tight for beef producers in Florida. Important management decisions must be made every day. Often the decisions made by the prudent farm manager may result in the difference between a profit or loss for the year. The manager must be aware of the different options available to him to improve the financial well-being of the cattle enterprise.

In beef cattle production, daily management decisions include all aspects of pasturing including when and how much to fertilize, weaning, marketing, and breeding stock selection. An important economic decision that has the potential to affect the profitability of a cow-calf enterprise is breeding stock selection. Selecting breeding stock is very important because many of the traits of the sire and dam can be passed on to the offspring.

A sire and a dam are essentially of equal importance in determining the inheritance of a single offspring. Their relative importance in a herd is determined by the number of progeny that each parent produces. Therefore, sire selection is the most important factor affecting the herd

level. Recognizing the importance of individual sires to overall herd merit, a breeder should carefully consider both a bull's soundness and his records prior to final selection.

Most characteristics of economic importance in beef cattle are controlled by many genes and the same traits are often greatly influenced by environment. Thus, management is a very critical factor in developing the traits that are being selected for breeding stock. A suitable environment has to be maintained for the better genotypes to have a chance to express themselves.

Selection is carried on for a variety of traits. For most farm animals selection is directed toward improving the usefulness of the herd. One central idea serves as a guide to all selection regardless of what trait or class of animal is being subjected to selection and that is a belief that selection will be effective in producing the results for which the producer (breeder) is striving. However, the degree to which people believe selection to be effective may vary widely.

Heritability estimates are very important in selecting breeding stock. Heritability gives us an estimate of what we can hope to receive by selection. Heritability estimates are based on the varieties in a particular trait at a particular time and under particular conditions. The information in Table 1 shows some actual heritability estimates for various characteristics of beef cattle.

Many selection factors can improve the overall financial situation of a cow-calf operation. The decision to purchase beef herd breeding

stock requires close scrutiny by ranchers, because in addition to direct costs and resources that may be affected, financial aspects such as income taxes and leverage may also be affected.

Great variation exists in the criteria used by cattlemen in selecting breeding stock. Performance testing information is often used that gives some idea on the production potential of the cows and the bull. Of course the quality of the management supplied (environmental factors) is also important in deciding what to purchase and how much to pay for breeding stock.

A number of traits may be considered in breeding stock selection. The emphasis placed on each trait should be determined by the heritability and the individual need for selection pressure for a particular trait. Breeders must have some knowledge of the heritability estimates for traits similar to those in Table 1. Many breeders tend to select for too many traits without regard to heritability. Types of traits that ranchers may be concerned with include:

- birth weight
- weaning weight
- calving assistance
- cow maternal ability
- pasture gain
- efficiency of gain
- carcass merit

Breeding stock that will improve the herd is worth much more than breeding stock that is similar to the average of the herd.

Prudent cattle producers need to manage their cow herd very closely and make wise decisions. All relevant information should be collected and researched. In terms of seed stock selection, some heritable traits are economically important both for the sire and the brood cows. Since the bull will be responsible for many more offspring during a given season, that selection is extremely important. Various tests have shown that the most important factors to consider in breeding stock selection from production records are:

1. weaning weight
2. yearling weight
3. birth weight
4. maternal performance
5. gain efficiency
6. scrotal circumference

Time spent on seed stock selection has the potential to yield extra income for the ranch. Sire selection is the most important factor affecting the overall herd performance. Producers need to be aware of the important economic factors in cow production and in breeding stock selection. Management ideas that will assist producers in making decisions include:

- maintaining up-to-date herd records
- keep a good identification system for all cattle
- look at performance record
- use progeny records to select and cull
- determine herd contributions by using expected progeny differences (EPD's) if available and understood
- conformation scores should be considered
- structural soundness is a factor
- carefully evaluate the number of years to retain bulls
- select for traits of economic importance
- analyze the potential economic benefits

### **COW-CALF EXAMPLE**

To illustrate how breeding stock may improve the economic situation for cow-calf operators some information and examples have been developed. A cow-calf budget is shown in Table 2 that estimates the costs for a 100-cow cow-calf enterprise. In this budget costs are almost \$24,000 per year to produce 90 calves. The costs include the typical variable expense items such as fertilizer, lime, and vet and medicine expenses, and overhead costs. The information in Table 3 shows break-even prices per hundred weight of calves sold at three different weaning weights. The higher the weaning weights the lower the price required to breakeven. This information clearly illustrates that increases in performance in a cow-calf

operation may improve the overall economic situation of the enterprise. To go one step further the information in Table 4 shows what the differences in income would be for the operation at an assumed price of \$.75 per pound. An increase of \$6,000 or \$75 per calf sold is realized with an increase in average weaning weight of 100 pounds.

Another example to illustrate the economic importance of selection follows. Suppose the rancher has the data from the performance tests of two bulls. In observing their weight per day of age, Bull A has gained .6 pound per day faster than Bull B. To determine the actual advantage of gain the following computation is needed.

.6 pounds  
 x .6 (heritability estimate for weight per day of age)  
 .36 divided by  
 2 (for sire affect only)  
 .18 pounds per day advantage

If we assume a price of \$78 per pound for 23 calves from the bull the following computation shows that Bull A has a \$581 income potential advantage over Bull B.

180 days at weaning  
 x .18 (extra weight advantage)  
 32.4 additional weaning weight  
 x 23 calves  
 745.2 additional pounds  
 x .78 price per pound of calves  
 \$581.25 additional income  
 advantage

Information such as the above is important when selecting breeding stock. In this example, for a 100 cow herd the total impact on the herd would be an additional \$2,324 (4 x \$581) for the first year by selecting the better bulls. Remember this is only looking at the advantage for one year and in reality cattle producers would need to determine the differences for the number of years they would keep the breeding stock. Of course any type of economic analysis would have to consider the

time value of money. A dollar today may not be worth one dollar at some future date. Thus, when projecting long term effects putting all dollar amounts in present value (today's dollars) form would be necessary.

Weaning weight is only one trait that may improve the economic situation of the cow operation. All the traits that are improved should be summed up when deciding what to buy to improve the herd. Obviously a bull with good performance data or progeny data (if available) is worth more than an "average" type of bull. The same may be said for all breeding stock.

A goal of ranchers should be to improve their herd. The numbers will clearly show that herd improvement pays. When figuring how to improve the herd and how much to spend, performance data and knowing the heritability of traits are important. As part of the planning process, ranchers should put the pencil to anticipated changes. The financial well-being of a cow operation will often depend on wise decisions by the manager.

Producers tend to improve their herds when the good times are rolling. The cattle market does directly affect what a bull on any type of breeding stock will bring. If the ranchers expect prices to be up in the future, he will usually pay more for breeding stock. Still constant herd improvement should be a goal for ranchers. Decision making should include an economic analysis of the charge. Payoffs do exist for careful seedstock selection. A bull may really be worth what he will bring.

## REFERENCES

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<b>Table 1. Heritability Estimates of Traits in Beef Cattle</b>	
<b>Trait</b>	<b>Heritability per cwt.</b>
Birth weight	40
Weaning weight	30
Feed lot gain	45
Efficiency of gain	45
Final feed lot weight	60
Cow maternal ability	40
Carcass grade	35

**Table 2. Estimated 1992 Costs for Southern Cow-Calf Enterprise (100 Cow Unit on 200 Acres, 90% Calf Crop, Spring Calving<sup>a</sup>)**

Item	Quantity	Price	Cost/100 head
		-- Dollars --	-- Dollars --
Fertilizer (10-10-10 200 lbs./ac.)	400 cwt	6.80/cwt	2,720
Nitrogen (40 lbs./ac.)	8,000 lb	.26/lb	2,080
Lime (1/3 ton/ac.)	66.7 ton	24/ton	1,601
Hay (1 ton/cow unit)	100 ton	70/ton	7,000
Soybean meal (125 lb./cow)	125 ton	13/cwt	1,625
Salt & minerals (\$3.50/cow unit)			350
Vet. & medicine (\$8/cow unit)			800
Maintenance, repairs & fuel			850
Interest on (8 mos.) oper. cap.	\$17,026	8%	1,362
Total cash costs			18,388
Less salvage value of 15 cull cows (950 lb.) @ .50 lb.	14,250 lb		7,125
Net cash costs			11,263
Overhead (depr., interest on inv., taxes & ins.)			5,000
Labor (6 hrs./cow at \$4.50/hr.)			2,700
Management (1/5 time, \$25,000 per yr.)			5,000
Total all costs			23,963

<sup>a</sup> 100-cow unit is 100 brood cows, 20 replacement heifers and 4 bulls.

**Table 3. Estimated 1992 Break-Even Prices for Southern Cow-Calf Enterprise on 200 Acres****Break-even prices per cwt. of calf sold**

<b>Item</b>	<b>Total amount</b>	<b>Price per cwt.</b>
<u>Weaning weight: 450 pounds</u>		
Net cash costs	11,763	31.29
Overhead	5,000	13.89
Labor	2,700	7.50
Management charge costs	5,000	13.89
Total all costs	23,963	66.57
<u>Weaning weight: 500 pounds</u>		
Net cash costs	11,363	28.16
Overhead	5,000	12.50
Labor	2,700	6.75
Management charge costs	5,000	12.50
Total all costs	23,963	59.91
<u>Weaning weight: 550 pounds</u>		
Net cash costs	11,263	25.60
Overhead	5,000	11.36
Labor	2,700	6.14
Management charge costs	5,000	11.36
Total all costs	23,963	54.46

**Table 4. Estimated Revenue for a Southern Cow-Calf Enterprise of 100 Cows**

<b>Weaning weights</b>	<b>Revenue<sup>a</sup></b>
450	\$27,000
500	\$30,000
550	\$33,000

<sup>a</sup> 80 calves sold at \$.75 per pound.