

HOW DO YOU SELECT SEEDSTOCK TO GET THE MOST FOR YOUR MONEY

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ASSUMPTIONS

It is assumed the producer who is making the selection has a defined crossbreeding program in place. The producer should have a formal plan including goals for a 10-year period and a plan to attain them by breed composition for: 1) the basic herd (say part Brahman (one-fourth or more) and part British); 2) the breed or breeds to be used from time to time as a terminal cross (exotics and extreme British); and 3) the breeds to be used to produce replacement heifers, the maternal breed (moderate-sized breeds).

In other words, the selection of seedstock is for a well-planned program designed to produce a pre-planned annual calf crop to meet the maximum priced feeder calf demand. Today that is basically the red or black baldy or an animal that contains enough white face and black ancestry having minimum Brahman expression, a frame 4 to 6 and a live finish weight steer weighing 1050-1250 lbs., choice with yield grade below 3.

SELECTION FOR MAXIMUM PROFIT

Bulls provide 80% to 90% of the genetic improvement in any given herd, even though the females obviously contribute to their individual calves. A bull will put his genetic stamp on 30 to 50 calves a year, while a cow only has one. Seed stock selection, then, basically is the selection of purebred bulls to achieve genetic goals which translate into higher profit and return on assets (the herd).

It is appropriate to compare the selection of seed stock to the selection of seed for planting.

Both have the same goal, that is to obtain the best return from a highly desired product. Seed and seedstock are germ plasm and sound selection requires as much information as can be obtained before decisions are made.

Most people would never buy seed to plant without some evidence it had been tested. No one seems to look at the seed and say, "That looks good. I'll take it." But when it comes to selecting bulls, many very capable cattle people believe they can look at a bull and judge his worth in genetics he will transmit to the herd.

Visual appraisal is one important tool, but it is just one of many tools. The others are basically measurements and probabilities based on massive breed data.

OBJECTIVE DATA

This consists of:

- 1)The individual record of a given bull, and
- 2)The Expected Progeny Difference (EPD) the bull will statistically sire.

MEASUREMENTS AND TRAIT SELECTION

There are many traits or markers people look for. See Figure 1. This listing shows a range of things some people may say they want, some being of mythical value.

However, the important selection traits are relatively few.

Figure 2. lists traits with the heritability factor of each trait.

Considering all of this information we believe the main selection traits to be those

listed in Figure 3.

Of these, yearling weight and birth weight are the most important.

Yearling Weight Yearling weight reflects weaning weight, since weaning weight is used to get the yearling weight computation. Yearling weight also most nearly matches bull weights with steers for slaughter.

An equally important trait is birth weight.

Birth Weight The first concern is to produce a live calf. Birth weight should be moderate in relation to the breed being selected, but the breeds must be distinguished by their characteristics. Basically, British breeds should have lower birth weights than exotics--Simmental, Charolais, Limousin, etc. The real correlation to large birth weights is large mature weight and late puberty which produces larger birth weights, traits common to the exotics and extreme-sized British breeds.

Birth weight selection becomes less important when the bull is being selected for terminal cross. It is still advisable to select breed average or less since no one can afford the loss caused by large birth weights even in a program like terminal cross, which uses no heifers in the breeding.

On the other hand, if the breeding herd has virgin heifers, it is almost mandatory that a breed with modest birth weights be used and also individuals with performance records indicating moderate birth weights.

There are bulls that produce moderate birth weights and also high yearling weights. Over several generations by selection, a seed stock producer can achieve this very difficult result. The writer has found that a bull can exhibit high yearling weight and moderate birth weights, but in most instances these bulls will **not** have as large mature weights as other bulls with equal yearling weights and higher birth weights.

Continued selection for highest yearling weight will usually produce heavier and heavier birth weights until hard calving becomes a major economic disaster. This problem is

classic and should not be allowed.

At Anhinga Farms, Polled Hereford bulls that had to be pulled or had a birth weight higher than 90 lbs. are not used. As a result, on average a fairly predictable modest birth weight, with an acceptable growth rate has been achieved.

The danger in selecting for one trait is the loss in other traits. It is demonstrably prudent to maintain acceptable overall traits in your herd bull battery to have a successful operation.

Maternal Performance Since British breeds for the large part will be used to produce replacement heifers, it is essential that the bulls selected have predictable higher maternal value, including adequate milk.

Acceptable measurable criteria for selection for maternal performance include estimates of probability that a certain bull's daughters will have high weaning weights on their calves and therefore will also be higher in milk production. A bull's own weaning weight proves his mother's milk production, but maternal EPD's are probably more important than individual records, since they combine all pedigreed animals in the EPD.

As all profit and return on assets require maximum production, the selection for maximum fertility is necessary.

Scrotal Circumference A critical measurement is 365-day scrotal circumference. The large scrotal measurement does two things--it predicts higher fertility in the particular bull and predicts his daughters will have above average fertility. The writer prefers a Polled Hereford bull with a minimum 365 day circumference of 34 cm. Some have measured 44 cm. and 40 cm. is not unusual. The average in Anhinga's tested bulls is about 36.5 to 37.5 cm. at 365 days.

Other Traits Other economically important measurements are ribeye area (believed to be fairly highly heritable), fat cover combined with hip height as a gauge of muscling, and at some future time pelvic measurement, when it can be

standardized and it is shown whether or not pelvic size in bulls corresponds with desired pelvic sizes in females.

EPD (EXPECTED PROGENY DIFFERENCE)

Once bulls are selected using the recorded data for traits needed or being sought for your particular herd, then it is time to move to consideration of EPD's.

EPD's are expected progeny differences in birth weight, yearling weight, scrotal measurement, maternal growth plus milk, and pure milk. (Figure 4)

Percentage accuracy of each EPD must be considered. As illustrated on Figure 4, low accuracy can have wide variations in each trait.

However, low accuracy EPD's used as a complementary tool along with performance records of an individual bull are much more reliable.

In using EPD's, select acceptable ranges for each trait and assign your value to each trait to determine a large number of acceptable bulls. Don't single trait select for growth or you will invite a probability of reduction in calf crop and poor maternal quality replacement heifers.

BREED SIRE SUMMARIES

Each breed has its own sire summary, or more accurately, its own animal model and its own base for statistical analysis of the breed's recorded data on performance.

BREED TO BREED COMPARISON IS NOT POSSIBLE. EACH BREED MUST BE CONSIDERED AS AN ENTIRELY DIFFERENT SIRE EVALUATION.

It is essential that you get copies of the sire summary of the breed from which you are making selections to understand the base used and averages for the breed involved.

For example, the sire summaries and EPD's for Horned Herefords and Polled Herefords are different because they are pegged to different bases (years) and do not contain cross-used

sires in great numbers.

This is changing, since both the Horned Association and Polled Association (as well as Canada) have financed a project at the University of Georgia to construct a North American Sire Summary.

THE OVERALL SELECTION

After making your choices using measurements and EPD's, then go to the visual appraisal.

Visual Appraisal Soundness, large feet, masculinity, good movement, no post legs or open shoulders and in some breeds pigmentation, and in all breeds, coat quality and thickness of hides are all considerations.

In this area of evaluation, you add pedigree information:

1) Where did the bloodlines genotype come from? A good selection practice is to look for deep south bloodlines, i.e. below the "gnat" line which runs from the Coastal Carolinas around to Texas.

2) Presence of line breeding which gives substantial comfort that genetic defects are absent and also to obtain greater assurance that the performance records will be repeated.

Bull tests and individual breeder performance data should be available from the seedstock producer. Most breeders or test stations should give most or all of the data included in Figure 5. Insist on honest records. If the producer does not have records, buying that person's seed stock is a higher gamble and selection from that producer has a small fraction of the value obtained by using full data.

CONCLUSION

Using all these available tools will help obtain better calves, hence more profit and return on assets.

Like all other businesses, the cattle business is one requiring long range planning and patience, the use of all available resources for selection and a realistic system of culling.

The perfect British bull would probably have a 75 lb. birth weight, a 700 lb. weaning weight, a 1200 lb. 365 day weight and a 1300 lb. mature weight. None of us would use a perfect bull since our learned wisdom would make us suspicious of a 1300 lb. mature bull.

So we will never see a perfect bull, only statistically better bulls by probability. Our common sense should lead us to the take least gamble to obtain the highest return on investment in seedstock. Using all the tools minimizes the risk.

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(Chapters 2, 11 and 12)

Figure 1--Traits That Can Be Selected For

Weaning weight	Horns
Yearling weight	Length of leg
Quality grade	Length of body
Yield grade	Length of head
Ribeye area	Body shape
Fat thickness	Bone
Feed efficiency	Pelvic size
Mature size	Hair color
Milk production	Style
Masculinity	Calving ease
Trim brisket	Marbling
Disposition	Tail head setting
Slope of rump	Tenderness
Straight topline	Muzzle width
Percent kidney knob	
Structural Correctness	
Freedom from inherited defects	

**Figure 2--Heritability Estimates
of some Economically Important Traits**

Trait	Heritability
Conception rate	.10
Calving interval	.08
Birth weight	.33
Weaning weight	.33
Cow maternal ability	.30
Feedlot gain	.45
Pasture gain	.28
Efficiency of gain	.45
Yearling weight	.40
Conformation score	
Weaning	.28
Yearling	.38
Quality traits	
Carcass grade	.33
Ribeye area	.55
Tenderness	.45
Fat thickness	.33
Retail product (%)	.30
Retail product (lb)	.65
Cancer-eye susceptibility	.30

Source: R. R. Frahm et al., *Oklahoma Beef Cattle Manual*, Oklahoma State University, Stillwater, 1983.

Figure 3--Limit Trait Selection

Limit selection to the most important traits.
Suggested traits In order of importance:
YEARLING WEIGHT
BIRTH WEIGHT
SCROTAL SIZE
WEANING WEIGHT
MATERNAL PERFORMANCE BY DAUGHTERS
(Maternal EPD's)
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If available, factor in:
FAT COVER
RIBEYE AREA
FRAME SCORE (Hip Height)

Figure 4.

What Are EPDs?

Expected Progeny Difference (EPD) may be used to estimate how future progeny of the subject animal will compare to progeny of other animals within the breed. The key words are estimate, future, compare and within breed. EPDs are not designed to predict the performance of one or two progeny of a sire, but rather should be used to compare bulls based on estimated progeny performance. EPDs predict differences, not absolutes. They describe the genetic value of an animal much like a feed tag describes the contents of a feed sack.

EPDs are computed as part of the APHA National Cattle Evaluation (NCA) program. The NCE program represents the application of the most recent genetic and computing technology for calculating EPDs for beef cattle. The Polled

Hereford NCE program incorporates all available performance into the prediction of an individual's EPD for the specific trait. An EPD may be based on any combination of individual performance, pedigree and progeny and grand progeny performance information. In addition, sire EPDs are more accurate than any thing previously available because they account for the following factors:

- * Genetic value of cows a bull is bred to.
- * Environmental differences affecting contemporary groups.
- * Quality of other sires in the contemporary group.
- * Genetic trend.

EPDs are reported in pounds of birth weight, weaning weight, yearling weight, maternal weaning weight and maternal milk. Scrotal circumference is given in centimeters.

ACCURACY

ACC (accuracy) is an expression of reliability of the EPD. Accuracy may range from 0.0 to 1.0. As accuracy approaches 1.0, the EPD is more reliable and can be expected to change less in the future as more progeny data are accumulated.

Accuracy may be categorized into low, medium and high reliability as follows: Low - 0.0 to .50; Medium - .51 to .75; High - .76 to 1.0. EPDs should be used to decide which bulls are selected while accuracy values suggest how extensively the bulls should be used. Bulls with favorable EPD values and

corresponding high accuracy values can be used with confidence that they will contribute favorably to genetic improvement of the herd.

Accuracy is an abbreviated method of expressing the reliability of an EPD. Another more specific indicator is standard error of prediction (possible change). Changes in EPD can be expected to fall within the possible change range 67 percent of the time. Listed below is a table showing the possible change at different levels of accuracy for each trait.

Possible Change for Various ACC Values
(Plus or Minus)

ACC	Birth Weight	Weaning Weight	Yearling Weight	Scrotal Circum.	Maternal Milk
0.0	3.9	17.2	25.4	0.69	19.9
0.1	3.5	15.5	22.9	0.61	17.9
0.2	3.1	13.8	20.3	0.55	15.9
0.3	2.7	12.1	17.8	0.48	13.9
0.4	2.4	10.3	15.3	0.41	11.9
0.5	2.0	8.6	12.7	0.34	10.0
0.6	1.6	6.9	10.2	0.27	8.0
0.7	1.2	5.2	7.6	0.20	6.0
0.8	0.8	3.4	5.1	0.14	4.0
0.9	0.4	1.7	2.5	0.07	2.0
1.0	0.0	0.0	0.0	0.00	0.0

As accuracy increases, the possible change decreases. For example, if the accuracy of a bull's yearling EPD is .20, the expected possible change in EPD is ± 20.3 lb. (potential range in EPD = +19.7 to +60.3 lb. for a bull with a yearling weight EPD of +40.0 lb).

If the yearling weight EPD accuracy is .8, the possible change in EPD decreases to ± 5.1 lb. (possible range in EPD = ± 34.9 to +45.1 lb. for a bull with a yearling weight EPD of +40.0 lb).

Figure 5--Information Gathered on Bull Test

- ☐ BIRTH WEIGHT
- ☐ RATIO
- ☐ ADJUSTED WEANING WEIGHT
- ☐ RATIO
- ☐ AVERAGE DAILY GAIN
- ☐ RATIO
- ☐ WEIGHT PER DAY OF AGE
- ☐ ADJUSTED 365 DAY WEIGHT
- ☐ RATIO
- ☐ SCROTAL CIRCUMFERENCE
- ☐ FAT COVER
- ☐ RIBEYE AREA
- ☐ PELVIC MEASUREMENTS
- ☐ HIP HEIGHT
- ☐ CONFIRMATION GRADE

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