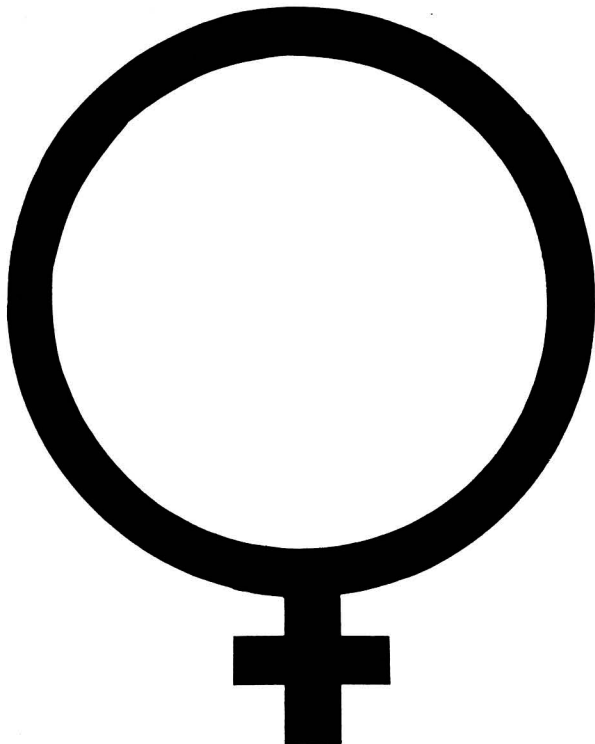


# SIRE SE

Selection represents the major directional force available to the beef producer for creating genetic change. Herd sire selection will influence over 90 per cent of the improvement made through selection decisions. Fifty per cent of the genes in a herd comes from the last bull used, 75 per cent from the last two, and over 80 per cent from the last three.

The seedstock producer sells genotypes, and the commercial producer phenotypes, so the genetic makeup or breeding value is the impact consideration in selling or buying herd sires. The traits that should receive major emphasis are those that are economically important and highly heritable. What then are the characteristics that should be considered in sire selection?

**A. Pedigree Data** — The best time to use a pedigree is before the animal is



# FEMALE

In our effort to develop and engineer cattle, sire selection has tended to overshadow the importance of selecting and establishing a highly productive cow herd. The superior beef herd, is most always backed up with a highly reproductive, consistent producing, good milking, large-framed, feminine, sound and uniform cow herd. These herds practice ruthless cow culling and critical selection of replacement heifers. Against this background, if breeders are to make progress in the years ahead, they must focus a great deal of attention toward the selection of the highly productive female.

**Individually or Type**—Excellence in type depends upon your goal. If you want to produce functional, highly productive herd bulls or choice feeder calves, you had better but the best females you can find. Regardless of body conformation, breeding females

# LECTION

born. We can examine his pedigree and get some estimate from his sire, dam, grandsire, grandam, etc. about what he is going to be. A performance pedigree with objective information is of particular importance in estimating the breeding value of a calf before birth. Distant ancestors are of little importance; for example, a great grandsire has a relationship of only 12.5 per cent. Table 1 gives an example of performance standards for herd bull Selection.

**.B. Performance Data** — For traits that are highly heritable (above 40 per cent) and economically important, the bull's own credentials are the best indicators of his breeding value. After the bull is born, the emphasis should shift to the bull's own phenotype and away from the pedigree. The individual traits that should receive major consideration are:

1. **Birth Weight** — The heritability of birth weight is .48, so significant selection pressure can be applied to

this trait. This trait is positively correlated with future growth rate, .39, however this is not the value that should be used to select for growth rate. Table 2 gives the expected calving difficulty with increased birth weights.

2. **Weaning Weight** — The heritability for weaning weight is 30 per cent primarily a maternal trait. Recent research indicates that selection for yearling weight will improve the breeding value for weaning weight more rapidly than direct selection for weaning weight itself.

3. **Yearling Weight** — This trait is highly heritable, 60 per cent, and a bull's own performance record is a good indicator of his breeding value for yearling weight. This is the most valuable parameter for predicting the genetic growth potential of a herd sire.

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**TABLE 1 — Performance Standards for Bull Selection**

Item	British	Medium Exotic	Large Exotic
Birth Weight	80	90	100
205 Day Adj. Wt. Lb.	600	650	700
365 Day Adj. Wt. Lb.	1100	1200	1300
365 Day Backfat In.	0.3	0.3	0.3
Frame Size (1-7)	5 (49")	6 (51")	7 (53")
Muscle Pattern	B	B	B
Mature Weight	2000	2200	2400

# SELECTION

must be sound in their feet and legs with no evidence of lameness. Females with sound clean bone joints and a good solid foot on each corner will save labor, veterinary bills, and will extend the productive life of the cow. Their mammary system should exhibit a strongly attached udder and no blind teats. Femininity, udder soundness, and development of extra genitalia are of major emphasis in selecting and culling females. The highly fertile cow is in beautiful proportion, and presents a graceful, feminine appearance. She is lean and clean in her face, neck and throat, and is long and smooth in her muscling. She is trim in her brisket, over her shoulders, and is long in her hip and high and wide at her pins. The lowly fertile cow is a coarse fronted, unbalanced, extremely deep-fronted cow that exhibits extra fat and is over conditioned. Her udder also appears

nonfunctional.

Today, it is of much more interest to beef cattlemen to cull cows with poor udders and pay attention to using bulls that sire daughters with well-formed functional udders.

Size is always an asset as long as it is associated with good conformation. Table one gives performance standards for female selection.

**Replacement Heifer Selection**—A young, highly productive cow herd that is making rapid genetic progress

depends on progressive selection procedures for replacement heifers. The following is a systematic program for selecting replacement heifers.

- A. Rank All Heifers on 205-day adjusted weights.
- B. Cut off bottom one-third; consider culling all those under 90 ratio unless circumstances are unusual.

*Continued on page 336*

**Table 1—Performance Standards for Female Selection**

Item	British	Medium Exotic	Large Exotic
205 Day Adj. Wt. Lb.	500	550	600
365 Day Adj. Wt. Lb.	650	700	750
365 Day Backfat In.	.3	.3	.3
Frame Size (1-7)	5 (47")	6 (49")	7 (51")
Muscle Pattern	C	C	C
Mature Weaning Wt. Lb.	1100-1200	1300-1400	1400-1500

**SIRE SELECTION**

*Continued from page 49.*

Bulls that excel in growth at this point will sire commercial calves that grow

more rapidly and efficiently to recommended slaughter weights.

4. **Mature Weight** — This trait is positively related to the previously

mentioned growth values. Selection for increased growth in the other categories will ultimately result in increased mature weight. Mature sire weight can be used to establish the mature cow size (wt.) desired. Divide the ultimate desired cow weight by .6 to estimate the mature bull weight needed. For example, if you want 1100-1200 pound cows, you need a bull that has a mature weight of 1800-2000 lbs. The optimum slaughter endpoint (choice - yield grade 3) is approximately 90 per cent of the weight of the cow (dam) for steers and 70 per cent of the dam's weight for heifers.

**TABLE 2 — Birth Weight and Calf Losses in Three-Year-Old Heifers Calving for the First Time**

Birth Weight of Calves	No. of Calves	Calves Dead at Birth (%)	Cow Experiencing Calving Difficulty (%)
40-49 lbs.	2	0	0
50-59 lbs.	22	18	5
60-69 lbs.	97	4	12
70-79 lbs.	131	2	18
80-89 lbs.	55	16	40
90-100 lbs.	10	20	30

C. **Physical Traits** — The physical traits that should be emphasized in today's ideal herd sire are fertility, frame, structure, composition (muscle and fat) and body capacity as they relate to maximum production efficiency.

1. **Fertility Traits** — The most important rating or score a herd sire can receive is high fertility. Physically, we can examine several traits that reflect a high score for fertility. In order for a bull to cover the country and seek out the cow herd for breeding, he needs an excellent sense of sight, *good eyes*. Another physical trait of importance is sound feet and a skeleton structured for longevity. Corns, prolapsed soles, or even slight founder can affect a bull's ability to breed a sufficient number of cows in a 60-day breeding season. These are all things we can visually appraise and/or score.

The most important physical characteristic we can examine and/or measure is the scrotal circumference and shape. Scrotal circumference size and shape are closely related to sperm cell production.

To obtain a valid measurement, it is important to first visually assess scrotal shape.

Most of the bull population one year of age and older would fall into a circumference range of 25-47 centimeters. The normal for a year old bull is between 32-34 centimeters.

Few bulls one year of age would classify as satisfactory with a scrotal circumference of 30 centimeters or less, and 34 centimeters for a two-year-old or older.

Overfitted or fat performance tested bulls may average two to three centimeters larger than those in good condition.

2. **Frame** — Frame (skeletal size) is rapidly becoming one of the most important traits to evaluate in beef cattle. Visual appraisal of frame size is

highly heritable (.6) and the repeatability of scoring cattle for frame runs higher (.8-.9) than any other trait we physically appraise.

The reason frame size is so important is its high association in identifying the physiological maturity pattern of cattle on the growth curve. For example, frame size can be effectively used with breed type to predict the optimum slaughter weight to finish feeder calves and the optimum slaughter end point (slaughter weight) for fat cattle to maximize total efficiency and carcass merit (Table 3). For example, a three frame Angus steer

should be marketed at 975 pounds to produce maximum pounds of edible beef per pound of energy fed to the steer and his dam. This also approximates a carcass composition of

low choice, yield grade two. This is the optimum endpoint on the growth curve for a three frame Angus steer, whereas 1075 pounds would be the weight to slaughter a five frame Angus steer.

**TABLE 3 — Expected Weights at Low Choice Grade**

	Steers	Heifers
Small frame British breeds	850-950	680-760
Average frame British breeds	950-1050	760-840
Large frame British breeds	1050-1200	840-960
Average frame European breeds and Holsteins	1200-1300	960-1040
Large frame European breeds	1300-1500	1040-1200

So, the frame size of bull selected should relate to frame size of the cow herd and how we want the progeny to serve the commercial industry. Currently, a bull that will sire a frame size feeder and slaughter steer of four-five can be marketed in the preferred 1000-1200 pounds bracket and produce maximum production efficiency. This sire may need a five, six or seven frame, depending upon the present frame size of the herd that he will serve.

**TABLE 4 — Frame Evaluation**

	AGE IN MONTHS														
	E	5	6	7	8	9	10	11	12	13	14	15			
	HEIGHT IN INCHES														
1	34	35	36	37	38	39	40	41	41.8	42.5	43				
2	36	37	38	39	40	41	42	43	43.8	44.5	45				
*3	38	39	40	41	42	43	44	45	45.8	46.5	47				
4	40	41	42	43	44	45	46	47	47.8	48.5	49				
*5	42	43	44	45	46	47	48	49	49.8	50.5	51				
6	44	45	46	47	48	49	50	51	51.8	52.5	53				
7	46	47	48	49	50	51	52	53	53.8	54.5	55				
	16	17	18	19	20	21	22	23	24						
	43.5	43.8	44	44.3	44.5	44.8	45	45.3	45.5						
	45.5	45.8	46	46.3	46.5	46.8	47	47.3	47.5						
	47.5	47.8	48	48.3	48.5	48.8	49	49.3	49.5						
	49.5	49.8	50	50.3	50.5	50.8	51	51.3	51.5						
	51.5	51.8	52	52.3	52.5	52.8	53	53.3	53.5						
	53.5	53.8	54	54.3	54.5	54.8	55	55.3	55.5						
	55.5	55.8	56	56.3	56.5	56.8	57	57.3	57.5						

The base point is 45 inches hip height at 12 months of age for a frame score of three. Allow two inches for each frame score at the same age. Allow one inch per month from 5 to 12 months of age, 0.50 inch per month from 12 to 18 months and 0.25 inch up to two years. Daily adjustment may be made as follows:

number of days over 365 x .025 + actual height = adjusted height.

Height for heifers are generally two inches less at the same age as those shown above.

**3. Structure Traits —** Although

geneticists and other researchers have down-played the importance of structural traits because they are difficult to measure in a quantitative manner, experience has taught us that a hereditary tendency is clearly evident. Ignoring these traits has resulted in herd sires that physically break down under breeding conditions and daughters that have to be culled from the herd too early.

Specific problems include bulls with straight shoulders, small inside toes, toe in considerably and take a short constricted stride. Leg problems of the rear limbs include cocked ankles that

give rise to worn off inside toes. Another serious rear limb problem is posty hind legs with straight pasterns leading to many stifled herd bulls.

Structure problems just mentioned are readily passed on to growing and finishing cattle and these unsoundness and poor performance appear to be related. The old belief that as long as a steer can reach the kill floor has created a poor image for the cattle industry. Herd sires that are predisposed to unsoundness characteristics mentioned and diagrammed below should be eliminated from the test stations, and

receive critical scrutiny in the show ring and on the ranch.

4. **Muscling** — In the beef business we are in the business to produce muscle and more animal breeding experts will agree that it should be contributed from the sire. Similar to frame, we can definitely move in two extremes — from too little to an excess. The other confounding factor is that cattle can exhibit a high percentage of muscle and it can be expressed in different shapes.

It is my opinion that a herd sire should pass on enough muscle to produce two cutability carcasses when the cattle are marketed at the optimum weight for their respective frame pattern. ☐

## ***NCA Review Of Cattle Industry Issues***

The cattle industry continues to face changes and challenges. Many of the developments become public issues, with proposals for government action. At any rate, here is a review of some of the latest issues.

1. *Marketing challenges*, centered around the much-talked-about beef pricing and reporting system, have the interest of nearly everyone in the industry. Regardless of one's views—and there are many—the frequent discussion of the controversial issue represents a major public relations problem for the industry.

Some of the proposals, such as those coming from Iowa Congressman Neal Smith, would significantly change the marketing system and would bring greater governmental involvement. It is clear that some problems exist with the current reporting systems and pricing practices. Less clear is what causes the problems and how to solve them.

Recently, the United States Department of Agriculture (USDA) formed a special Beef Pricing and Reporting Task Force to advise Secretary Bob Bergland. The task force, which has held hearings at which the National Cattlemen's Association (NCA) and many of its affiliates testified, is making recommendations to Secretary Bergland. JoAnn Smith, Chairwoman of NCA's Beef Promotion and Consumer Relations Committee, is a task force member.

In addition, a special subcommittee of NCA's Marketing Committee has been named to study problems in beef

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## FEMALE SELECTION

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- C. From the top two-thirds remove those that are:
  - 1. Structurally unsound.
  - 2. Small framed.
  - 3. Unfeminine.
  - 4. Overfat.
- D. Rank on 12 month ratios.
- E. Remove those that failed to grow.
- F. Expose to a bull for 60 days; pregnancy check 60 days after breeding; cull those that are open.
- G. Cull again after the first calf.

**Criteria for Culling Cows**—The progressive breeder who adds young, genetically superior replacements will simultaneously be culling the lower end of his mature cow herd. Ruthless cow culling is a must, and the following guidelines should be followed:

- A. Cull **open** cows after a 45-60 day breeding season regardless of their records. Pregnancy check to make this decision.

B. Cull cows with poor progeny records:

- 1. Poor growth performance ratios under 90 at weaning and/or yearling.
- 2. Inconsistent records from year to year. Usually vary with the quality of the bull used, indicating little prepotency for performance.
- 3. Low quality calves with poor visual grades and scores.

**Milk Production**—The primary goal of any breeding program is to produce cows with the genetic capability to make a profit. In cow-calf operations, increasing the weaning weight of calves has been the primary goal to attain this economic return. Because of the high relationship between weaning weight and milk production, new heavy milking breeds such as Simmental, Maine-Anjou and several of the dairy breeds have been infused into the genetic make-up of our beef herds. This appears good on the surface, but recent data indicates that extra high milk yields negatively effect the total performance and economic merit of the cow.

The average daily milk production during lactation for a beef cow is 12

pounds with a conversion of one pound of calf gain per 10 pounds of milk. As milk yield increases much above this range conversion rate is reduced and feed requirements for the cow increase substantially. Cattlemen also complain about cows that give too much milk because they are predisposed to mastitis, spoiled udders and milk scours in calves. In addition, increased milk yields and weaning weights have indicated a strong relationship to poor reproductive performance (Table 2). The gross return per calf is higher for the heavier milking cows with the larger calves at weaning, however, when this is adjusted for land and supplement requirement, and conception rate net return favors beef cows that are considered good milkers, averaging 14 pounds per day (Table 3). The recommended average amount of milk that a beef cow should yield per day lactation is impossible to estimate. It should be determined in a breeding program by the nutritional requirements, the desired calf performance, and the cow's reproductive efficiency.

***See Table 2 and Table 3 on page 338.***

**Table 2—Milk Production, Weaning Data and Reproductive Performance<sup>1</sup>**

Item	Hereford	Hereford x Holstein	Holstein
Total lactation, lbs.	3360	5040	6720
Daily milk yield, lbs.	14	21	28
Adj. wn. wt., lbs.	604	658	763
Rebreeding conception, %	96.2	89.3	59.0
Days post-partum to apparent conception	75	76.5	94.5

<sup>1</sup>Oklahoma State University

**Table 3—Economic Analysis<sup>1</sup>**

Item	Hereford	Hereford x Holstein	Holstein
Land requirement percentage	100	110	137
Total cost/female, \$	113.99	123.28	159.02
Return adj. for conception, \$	50.35	45.64	9.58

<sup>1</sup>Oklahoma State Univ.

Expressed as % of Herefords as determined by forage intake in dry lot.  
Combination of land and supplement cost.

MPPA for weaning weight ratio is computed with the following formula:

$$MPPA = H + \frac{NR}{(C - H) + 1} + (N-1)R$$

Where H = 100 the herd average weaning weight ratio

N = the number calves included in the cows average

R = .4 the repeatability factor for weaning weight ratio, and

C = average for weaning weight ratio for all calves the cow has produced.

MPPA is the best procedure for ranking cows in a herd on milking ability.

**What conclusion can be reached?**

1. Obviously selection for frame weight and type pays.
2. Using birth, weaning, yearling and mature weights, height and fat measurements, ratios, and etc. is the best way to select breeding animals.
3. Set your selection standards and use every tool available to achieve them. 