

# Beef Performance Testing



## Preweaning Phase

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The beef cattle breeders' goal for profitable beef production should be to improve cow reproductive efficiency and produce rapid- and efficient-growing calves that yield a superior carcass.

To help Minnesota producers achieve this goal, a simple, accurate, systematic record program is available for the beef herd. This performance-testing program offers beef cattle producers a means of measuring differences among animals within a herd.

### ECONOMICALLY IMPORTANT TRAITS

The on-the-farm performance testing program emphasizes traits of major economic importance such as: reproductive efficiency, cow mothering ability, calf rate of gain, efficiency of feed use, conformation as it contributes to carcass desirability, and longevity.

Genetic improvement from a well planned breeding program may seem slow. The amount of genetic improvement depends on the heritability of the trait, amount of selection pressure, genetic association of selected traits, and generation interval.

Heritability is defined as the portion of the average superiority of selected parents that is passed on to their offspring. Heritability estimates the proportion of the total variation in animals that is caused by heredity. Table 1 shows the average heritability estimates for some economically important traits.

Table 1. Heritability estimates of various beef cattle traits

Characteristic	Average percent
Mature cow weight	60
Feedlot gain	45
Efficiency of gain	40
Cow mothering ability	40
Birth weight	40
Pasture gain	30
Weaning weight	30
Weaning conformation	25
Reproductive efficiency	10

These estimates show that cow reproductive traits are relatively low in heritability but growth traits are relatively high. With highly heritable traits, there is more resemblance between parent and offspring than with lowly heritable traits. Rapid progress is possible, if traits with the highest heritability estimates are selected.

Heritability estimates for growth are influenced by sex of animal, age of dam, and how the animals are managed in comparison to their contemporaries. All calves evaluated should be handled uniformly so that genetic differences can be measured.

Concentrate on traits of major economic importance. When you select several traits, expect slower improvement in each trait. For example, if two traits are selected, improvement in either of the two can be only 70 percent as intensive as when only one trait is selected. Therefore, selection for points without real value to the industry slows the rate of genetic improvement.

Genetic associations may exist between two or more traits. If genetic associations are positive, the overall improvement rate tends to lead toward an automatic improvement of associated traits as selection is practiced for only one trait. Current beef cattle breeding research findings indicate that major genetic associations are positive. A positive relationship exists between milking ability and calf weaning weight; therefore, selection for greater 205-day weaning weights should improve cow milking ability. Selection for extreme muscling, however, may impair reproductive performance.

Generation interval is nearly 5 years in most beef herds. The generation interval can be shortened and yearly progress increased by replacing present breeding stock with genetically superior cows and bulls as soon as possible.

The genetic improvement you make will be difficult to measure accurately because of changes in management and year-to-year environmental changes. These factors tend to mask genetic improvement. Large increases in performance in a short time often can be attributed to improved environment. The actual amount of progress you make each year depends on how severely you cull the cow herd and add superior replacements. Because nearly 40 percent of the heifers are needed for replacement each year, little improvement can be made through the cow herd. The major source of herd improvement will be through rigid selection of herd bulls. You should use all individual and progeny records available to help you select your herd sire.

### PROGRAM PROCEDURES

#### Identification

All cattle entered in the program must be properly identified. Each animal should have a different number. A

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system should be developed for identifying each cow, calf, and sire in the herd. Cattle can be identified permanently with ear tattoos, ear notches, horn brands, or hide brands (figure 1).

FIGURE 1



Ear tags, neck chains, ear notches, and hide brands (figure 2) can be used for quick identification. Various identification systems are available using letters and numbers. One suggested number system is to identify by year and number of calf. For example:

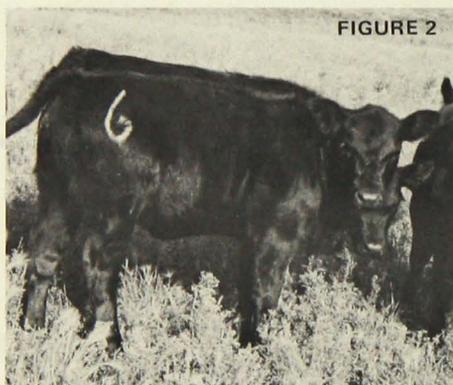
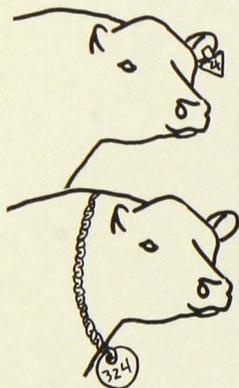
14 could be calf number 1 born in 1974

24 could be calf number 2 born in 1974

The number and year could be interchanged:

41 could be year 74 calf 1

42 could be year 74 calf 2



### Birth record

At birth a calf should be given its own number, and its identifying information should be recorded in Field Calf Record Book (figure 3).

The sire and dam number should be recorded with the birth date. Because birth weight is a moderately heritable trait and influences calving ease, it should be recorded. If calf weight is not recorded, a standard 70-pound weight will be used to compute the adjusted 205-day weaning weight. The breed of the calf's sire should be reported. Table 2 shows the breed code listing.

Table 2. Breed code listing

Code	Breed	Code	Breed
1	Angus	51	Commercial
3	Barzona	53	Angus X
5	Beef Brown Swiss	55	Barzona X
7	Blonde D'aquitaine	57	Beef Brown Swiss X
9	Brahman	59	Blonde D'aquitaine X
11	Brangus	61	Brahman X
13	Charolais	63	Brangus X
15	Chianina	65	Charolais X
17	Devon	67	Chianina X
19	Galloway	69	Devon X
21	Hays Converter	71	Galloway X
23	Hereford	73	Hays Converter X
24	Holstein	75	Hereford X
25	Limousin	76	Holstein X
27	Maine-Anjou	77	Limousin X
29	Marchigiana	79	Maine-Anjou X
31	Murray Grey	81	Marchigiana X
33	Polled Hereford	83	Murray Grey X
35	Polled Shorthorn	85	Polled Hereford X
36	Milking Shorthorn	87	Polled Shorthorn X
37	Red Angus	89	Red Angus X
39	Red Poll	91	Red Poll X
41	Santa Gertrudis	93	Santa Gertrudis X
43	Scotch Highland	95	Scotch Highland X
45	Shorthorn	97	Shorthorn X
47	Simmental	98	Simmental X
49	Welsh Black	99	Welsh Black X

### Weaning record

#### 205-day calf weight

Weaning weights are measured to evaluate differences in cow mothering ability and calf growth potential. For the best genetic measure of weaning weight, all calves should be handled uniformly.

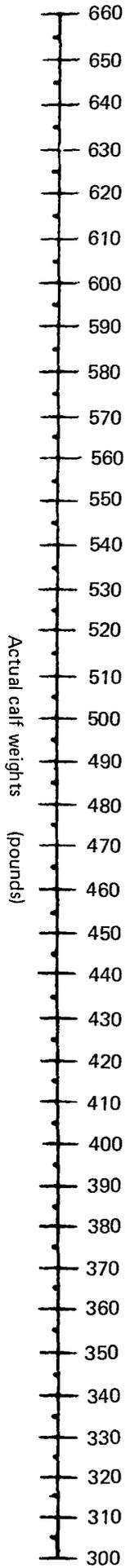
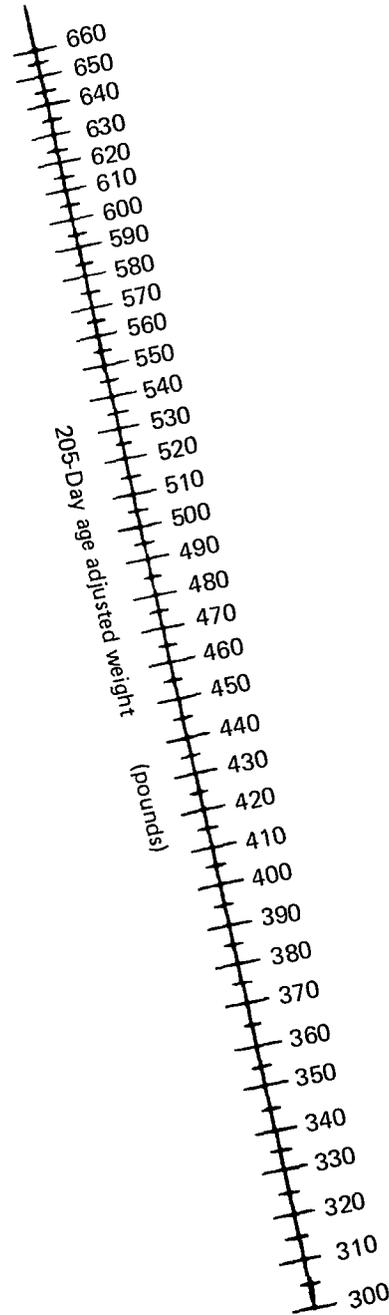
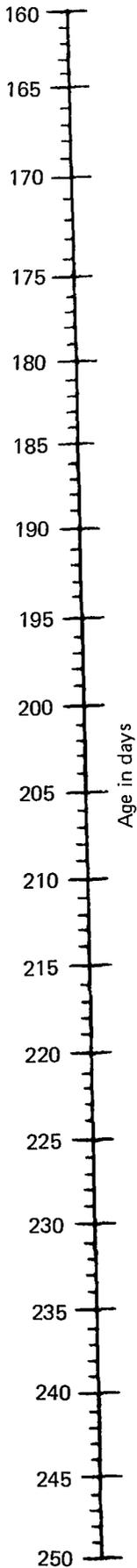
Calves should be weaned between 160 to 250 days of age. All records are then adjusted to a standard 205 days of age. Calves weaned outside this range will be regarded as having irregular records. The 205-day weight will be computed based on average daily gain from birth to weaning. This is accomplished by subtracting 70 pounds or actual birth weight from actual weight at weaning. This difference is divided by the days of age at weaning. The average daily gain is multiplied by 205 and added to the 70 pounds or actual birth weight. This figure gives the actual calf weight if the calf had been weighed at 205 days. Figure 4 can be used as quick means of calculating 205-day weight using a standard 70-pound birth weight.

FIGURE 3

FIELD CALF RECORD

Calf Tag No.	Birth Date	Sex	Dam	Sire	Bt. Wt.	Remarks or Memorandum
41	3-2	F	14	1	80	
42	3-2	F	37	1	85	
43	3-4	M	36	18	70	
44	3-5	M	24	18	66	
45	3-5	M	44	1	90	
46	3-5	M	28	1	95	Pulled
47	3-6	F	40	20	70	
48	3-8	F	1	20	73	
49	3-9	F	39	18	65	
410	3-10	M	76	18	72	
411	3-10	F	125	1	81	
412	3-11	M	15	1	90	Dead
413	3-14	F	101	1	75	
414	3-16	F	27	20	75	
415	3-17	M	3	18	60	

Figure 4. 205-Day Age Weight Adjustment Chart



To adjust weaning weight to 205 days, use ruler to connect calf's age in days with its actual weight. Age-adjusted weight appears where ruler crosses center scale.



### Cow-calf ratio

All cows in the herd should be weighed periodically. Because a large cow will require more pounds of feed for body maintenance, she should produce more pounds of calf at weaning.

A cow-calf ratio can be used to evaluate the efficiency of each cow in the herd. The pounds of total digestible nutrients needed per year for a cow to produce each pound of calf constitutes the cow-calf ratio. Since this ratio is just an estimate (from NCR requirements), use it cautiously as a criterion for culling cows.

### Cattle conformation grading

Calf conformation grading should be a reflection of potential carcass desirability and structural soundness. Conformation is a moderately heritable trait and responds to selection. Because conformation ideals have dramatically changed the past years and probably will continue to change, undue emphasis on minor factors that influence conformation score is not justified.

To be able to evaluate beef cattle properly, you should know the parts of the beef animal and their locations.

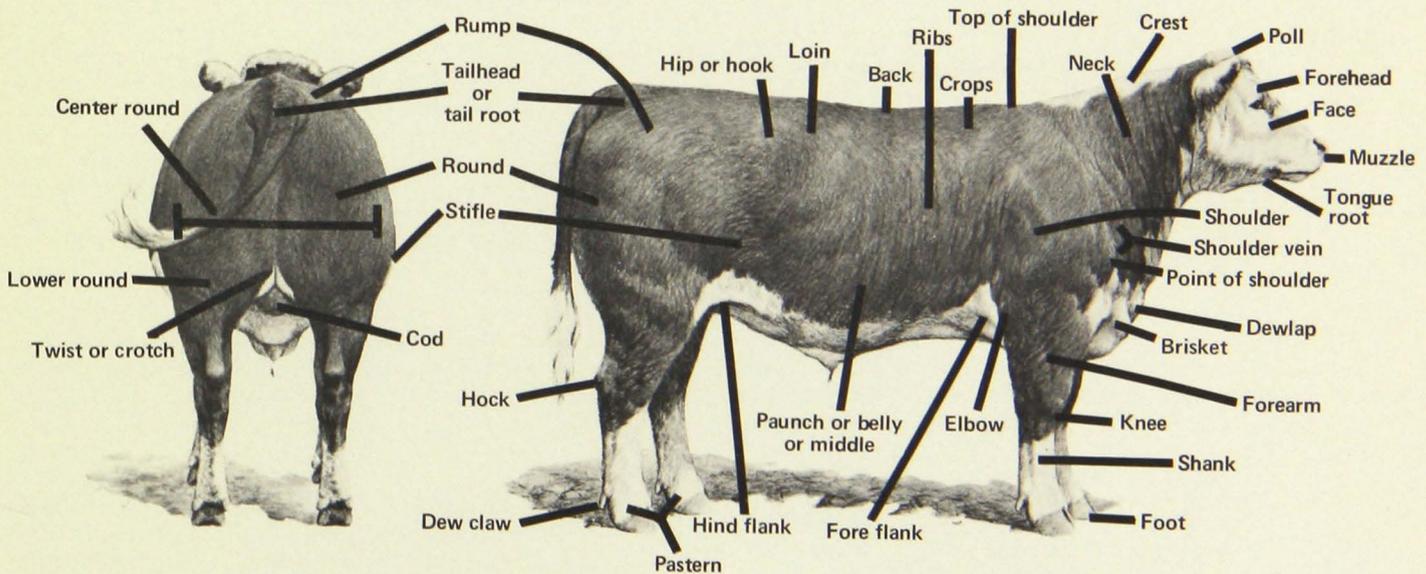
The recommended conformation grading system is divided into four major categories: body form, muscle, condition, and structural soundness. Scores range 1 through 5 within each

category. Score 1 denotes the least and 5 the highest degree of trait expression.

Body form is primarily influenced by size of frame and skeleton. It should be the basic criteria in grading a calf. The thickness and shape is changed by the relative amount and ratio of muscle and fat. Because large-framed calves are more apt to be longer muscled, they often are underevaluated. As maturity develops, their musculature tends to catch up with their skeletal growth. Therefore, big-framed calves may have lower muscle ratings than smaller-framed, earlier-maturing calves.

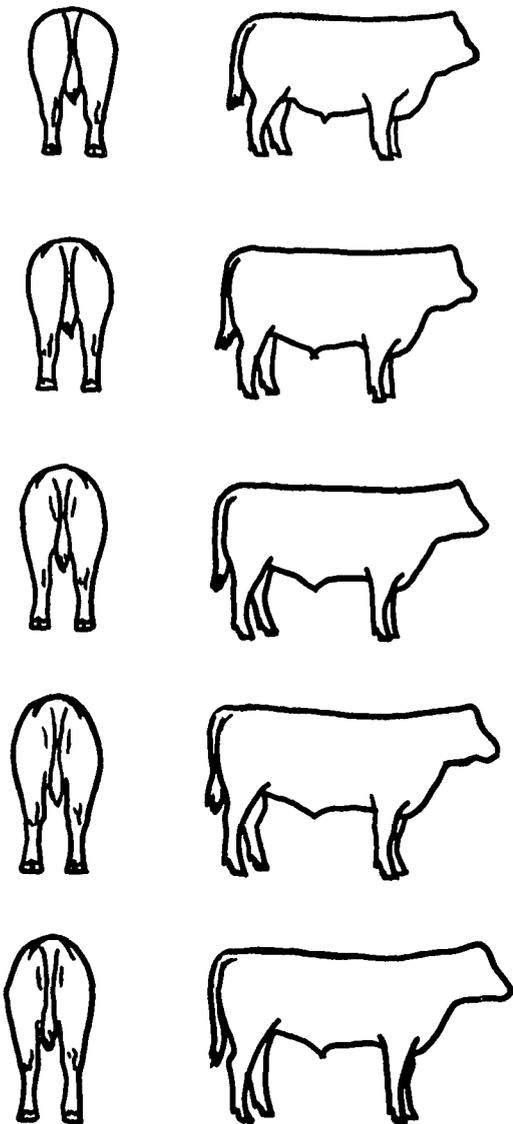
Body skeleton, muscle, and fat deposition influence the thick, deep, and smooth appearance. The difference between muscle and fat deposition can be visually scored. Calves that are very full in their flanks, neck, brisket, and twist areas have deposited fat at too early an age. They also tend to be smaller in frame. This thickness caused by fat should not be confused with natural muscling. Calves that have an excessive predisposition to fat, are light or extreme in muscling, and have a small frame, should not be selected.

Structural soundness should be scored so that unsound cattle that are extremely post-legged or weak in structure are scored "1". Cattle with minor faults should be scored "3" and those cattle with no visible faults should be scored "5". A notation of structural unsoundness on the calf's record is recommended and is helpful in future record use.



## Parts

### BEEF CATTLE PARTS



### Body form scores

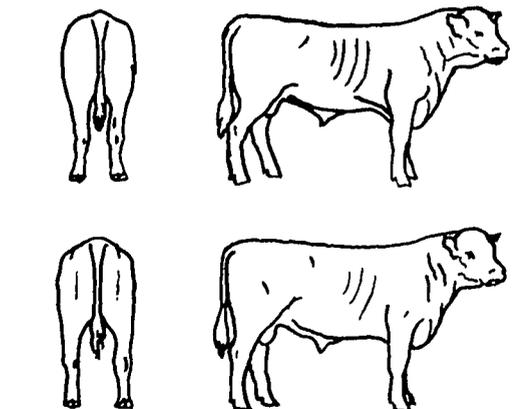
Although body form tends to be influenced by the amount of muscle and condition, body form scores should reflect the general amount of skeletal development. Yearling scores generally are more accurate than calf body scores because body type differences become more obvious with maturity. Scoring is made on a 1 to 5 basis as follows:

- 1 – Body form 1 should be used for animals extremely short in every dimension of skeletal development. Cattle of body type 1 are short-legged, short-bodied, and very compact and generally show a tendency toward the predisposition to waste. These calves often show bulging, thick quarters. Likewise, they will show an advanced stage of maturity in the head and neck regions at 1 year of age.
- 2 – Cattle of body form 2 are not as compact as those of body form 1; however, they are short in their body skeleton and have a more mature look as yearlings than cattle scored with body scores of 3, 4, or 5.
- 3 – Cattle of body form 3 are medium in size and exhibit enough growth potential as yearlings to continue to grow. These cattle are neither extremely small nor large.
- 4 – Cattle of body form 4 are taller, longer, larger animals and exhibit more length in all dimensions than cattle of body form 3. The maturity of type 4 cattle is generally not as advanced in the yearling stage as cattle of a lesser body type.
- 5 – Body form 5 describes the longest and tallest animals. Yearling cattle of body form 5 give indications of being extremely big as mature animals and are longer in all dimensions than cattle of lesser body types. Many times yearling cattle of type 5 will show a less mature look than animals of the same age of a lesser body type and, in some cases, may resemble a calf look about the head and neck even at 12 months of age.

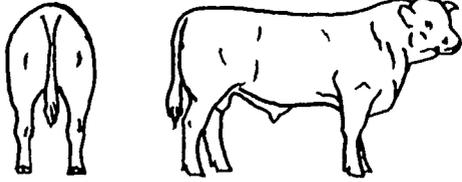
### Muscling scores

Muscle scores range from the very thin to the extremely bunched muscled beef animal. All animals have the same

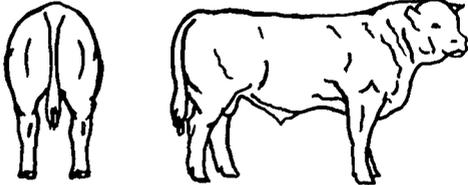
general skeleton. Muscle development in yearlings can vary as greatly as it does in calves, but is generally easier to evaluate. It should be scored, using a 1 to 5 basis as follows:



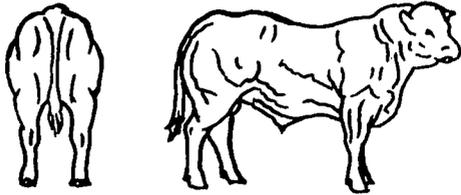
- 1 – Very light muscled – Animals with a score of 1 lack thickness and bulge in the forearm and stifle regions and often appear flat over the loin. Often, animals in this score will stand close behind and in front because of having too little muscle. Their rounds are angular and flat in shape.
- 2 – Light muscled – Below average in muscling but not as lightly muscled as number 1. Young, fast-growing beef calves may be long muscled and lack the mature look. As yearlings these cattle may be flat and long muscled.



- 3 – Medium muscled – Calves have ample evidence of muscling in both the front and rear quarters. Forearm and stifle regions are well developed. Front and rear legs are positioned naturally wide with the thickest portion of the rear quarters being in the stifle region. The loin is fully turned and shows evidence of being both naturally thick and meaty.



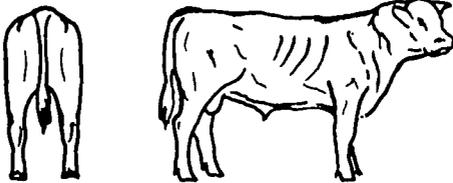
- 4 – Heavy muscled – Calves are more muscular than those scored 3. These animals have an abundance of muscling in the rear quarters and have muscular shoulders and forearms. Abundant muscling is expressed in both the inside and outside round which ties low into the hock joint.



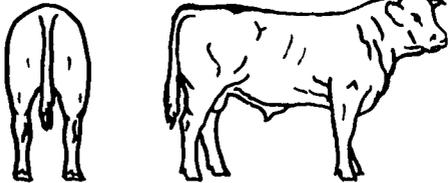
- 5 – Double muscled – Animals that are assigned a muscular score of 5 distinctly show evidence of being double muscled, have a distorted tail setting, show definite creases in the rear and fore quarters, and exhibit very prominent and bulging muscular development in all other regions.

#### Condition scores

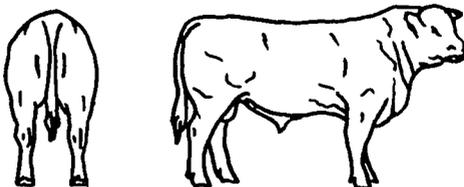
Condition scores relate the degree of fatness of a particular animal and can be subjectively measured to a certain degree. Condition scores should be made using a 1 to 5 basis as follows:



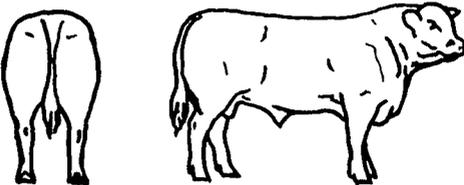
- 1 – Very thin – Animals with a condition scored 1 are too thin and should be carrying more natural fleshing. Yearling cattle carrying too little condition often appear lightly muscled and in an unthrifty condition.



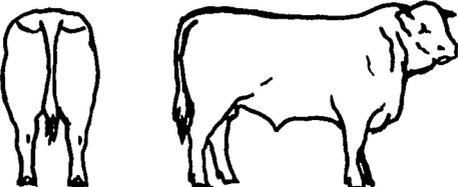
- 2 – Thin – Animals scored 2 are thin fleshed, but not as thin as 1. Calves exhibit open ribs, flat quarter, cut up flanks, and twist. Hook bones are prominent. Loins are flat.



- 3 – Modest – Animals scored 3 are carrying enough condition to work for most producers under a variety of environments and are not considered too fat. The muscles are smooth. The ribs, hook, pin bone, and point of shoulder are covered. The animal is relatively trim in the brisket, neck, and flanks.



- 4 – Moderate – Animals scored 4 have more than the modest condition. The back and rump are showing a square appearance. The shoulder vein, point of elbow, flanks, and twist are relatively full. The brisket and dewlap are wasty.



- 5 – Fat – Cattle scored 5 for condition are definitely too fat. Many times cattle in this condition will appear flat across the loin with excessive fullness in the twist and brisket regions. Patchy condition is noted around the tailhead, rump, loin, and neck regions. Quarters are long, full, and deep. Generally, fat is deposited in the cod and udder region. This condition may cause fertility problems.

The body form, muscle, condition, and structural soundness scores describing each of the traits disregard the desirability of the particular score. The scores can be used with the adjusted 205-day weaning or yearling weights for a description of each animal. These scores are an optional part of the program. Many producers may want to use only weights as their selection criteria. Other producers may score their cattle only as yearlings. The cattle can be scored at any time. However, the cattle must be weighed as near to the 205-day weaning or 365-day yearling day period as possible.

If the producer wants an overall conformation score on each animal, a conformation scale ranging from 17 to 3 can be used.

Cattle eligible to score 17 through 15 have no major faults in their skeleton and muscular structure. The top scores describe beef cattle of ideal conformation that are strictly herd bull and outstanding replacement heifer prospects. These calves should have a 3 or 4 muscle score, be free of excessive waste and fatness (less than condition score 4), and have a large frame and skeleton (body form 4 or 5), sound feet and leg structure, and strong sex character.

The conformation score "17" is rarely given to calves but is reserved for the yearling grades. Therefore, calves scored 16 or 15 must be exceptional. Size of frame should be the basic criterion to grade a calf in the 10 to 15 range. Muscling may change the grade by one score but no more than two scores. Since large-framed calves are more apt to be longer muscled, they often are undervalued. As large-framed calves become mature, their musculature form tends to catch up with their skeletal growth. Therefore, large-framed calves may have lower muscle ratings than smaller-framed, earlier-maturing calves.

Body skeleton, muscle, and fat deposition influence the thick, deep, and smooth appearance. Calves that are very full in their flanks, neck, brisket, and twist areas have deposited fat at too early an age. They also tend to be smaller in frame. This thickness due to fat should not be confused with natural muscling. Calves that have excessive condition to fat (condition scores 4 and 5) should be scored at least two scores below the initial conformation score.

Unsound feet and legs influence the length of cattle reproductive life and affect the breeding cattle's ability to move. Feet and legs should be placed squarely under each corner of the body. A slight angle to the hock and pastern is more desirable than an extremely straight leg and short steep pastern. Some angle at the hock and pastern gives some spring and flexion helping to maintain soundness in later life. Unless a structural defect seriously impairs a calf's ability to walk, the score should not be changed more than one score.

Breed and sex character is important only as a reflection of fertility and reproduction. However, breeding and calving records are more important for evaluating reproductive performance. For breeds emphasizing the polled trait, an examination for scars may be justified.

Usually a short, broad, massive head indicates early maturity and a smaller body frame. Therefore, head and sex characteristics have been evaluated indirectly with frame.

Calves receiving the 14 to 12 scores should have no more than moderate faults in skeletal structure and muscle and should have an average amount of condition. Calves in this category should include a high percentage of all calves in the better purebred herds.

The calves scored 14 should have above average frame (body form 4), average to above average muscle (muscle score 3) and minimal feet and leg problems. Scores of 13 are given to the average calf. He may be smaller in frame (body form 3) with more fat deposition (condition score 4). These calves also could be somewhat marginal in muscle development (muscle score 2) if they have adequate frame (body form 4). Scores of

12 are given to calves that tend to be smaller in frame (body form 2) and below average in muscle (muscle score 2). These calves also could be faulted in some structural soundness (structure score 2). Calves in this grade could have different forms depending on degree of frame or muscle.

Calves in the 11 to 9 category may have moderate to severe faults in some items of skeletal or muscular structure. Calves that are extremely short bodied or short legged (body form 1) or that have extreme fat deposition (condition score 5) should not score above a 9, no matter how heavily muscled or structurally sound the calf may be. Average framed calves with deficient muscling should not grade above a 10 score.

Calves with the extremely heavy muscle described in muscle score 5 should not be scored above a "5" overall conformation score regardless of body structure or frame. This is a serious conformation fault, and all animals with the double muscled trait should be culled.

## Record analysis and use

After the calves have been weighed and graded, the calf weaning record (AH-11) should be completed immediately and sent to the state or regional office. If the purebred breeder is participating in his own breed association program, the weaning record should be sent to his national association office. The weaning record will be summarized by sex, sire, and herd (figure 11).

The data obtained will supply the producer with information necessary to estimate the relative productiveness of each animal under the conditions in which the records were kept. The records should be used to cull or retain cows in the herd, select sires for use as future herd sires, evaluate herd sires already in service, select replacement heifers, and advertise to prospective buyers who want to improve their herds.

The completeness of record keeping and emphasis on the use of records may vary between the purebred breeder and commercial producer. Their long range goal may be the same even though the methods of achieving this goal may be different.

The purebred breeder should have a more intensive record and a higher standard for culling and selecting herd replacements.

The commercial producer is interested primarily in maximum pounds of beef produced efficiently. He may not be able to justify the additional fencing required to evaluate individual sires or the culling standards set by the purebred breeder.

The initial step for commercial herd improvement is to purchase bulls with superior performance records. Bulls should be selected from superior herds that have accurate and complete performance records. Where several bulls are needed, uniformity of the herd will be improved if bulls of similar breeding are purchased.

To increase the rate of genetic improvement divide the cow herd on its performance records. Mate the top performance cows to the best bulls available. Most of the replacement heifers should then be selected from this top herd.

## EQUIPMENT NEEDED

Each breeder must provide scales. Portable scales are available at many feed dealers, through beef associations, and from other area producers. A coordinated plan of weighing calves can be organized through your extension agent and vo-ag instructor. Adequate chutes and working area are necessary to weigh and grade the calves. If these facilities are not available, identification and handling of calves is difficult.

A teletype computer facility (figure 12) is available at 101 Peters Hall, St. Paul Campus, U of M, at each experiment

FIGURE 11

AGE – DAM'S – AGE IN YEARS  
 AGE – CALF'S – AGE IN DAYS  
 LBS – DAM'S – WEIGHT OF DAM WHEN CALF WAS WEIGHED  
 LBS – CALF'S – ACTUAL WEIGHT OF CALF ON DATE WEIGHED  
 205LB – 205 DAY EQUIVALENT WEIGHT ADJUSTED FOR AGE OF DAM  
 ADG – CALF'S AVERAGE DAILY GAIN FROM BIRTH DATE TO DATE WEIGHED  
 RATIO – IS CALCULATED BY DIVIDING EACH INDIVIDUAL'S 205 DAY ADJUSTED WEIGHT BY THE AVERAGE OF ITS SEX GROUP EXPRESSED AS PERCENT  
 FMCS – EACH COLUMN IS THE SCORE FROM 1-5 ON FORM, MUSCLE, CONDITION, AND STRUCTURAL SOUNDNESS.  
 GD – CONFORMATION GRADE  
 CCR – POUNDS OF TDN (APPROXIMATED FROM NCR REQUIREMENTS) PER YEAR NEEDED TO RAISE A POUND OF CALF.  
 USE ONLY AS A COMPARISON OF RELATIVE STANDING WITHIN THE HERD. CALF WEIGHT HAS NOT BEEN CORRECTED FOR THE AGE OF DAM. SINCE THE NUMBER IS JUST AN ESTIMATE, USE VERY CAUTIOUSLY AS A CRITERIA FOR CULLING.  
 (NOTE: THE LOWER NUMBERS INDICATE THE BETTER COW; NOT THE HIGHER NUMBER)

PROCESSING DATE 74/11/16.

COUNTY  
 COUNTY CODE 43  
 OWNER CODE 186

MINNESOTA 56098

PROGENY OF SIRE NO. 225

DAM INFORMATION			CALF INFORMATION			205LB	ADG	RATIO	GRADE F-M-C-S	S	BORN	CCR
ID NO.	AGE	LBS	ID NO.	AGE	LBS							
104	7	1110	64	216	410	392	1.57	96	4-3-4-3-15	H	3-19	7
1 HEIFERS AVERAGED				216	410	392	1.57	96				
49	4	1125	12	211	390	399	1.52	85	3-3-3-3-13	B	3-24	8
1 BULLS AVERAGED				211	390	399	1.52	85				

PROGENY OF SIRE NO. 858

DAM INFORMATION			CALF INFORMATION			205LB	ADG	RATIO	GRADE F-M-C-S	S	BORN	CCR
ID NO.	AGE	LBS	ID NO.	AGE	LBS							
50	3	1075	68	206	355	388	1.38	95	3-3-3-3-13	H	3-29	8
85	7	1250	76	191	430	456	1.88	112	4-2-4-4-15	H	4-13	7
46	4	1045	70	203	380	402	1.53	99	3-2-4-3-14	H	4-1	7
59	4	1135	72	197	440	477	1.88	117	5-3-4-2-15	H	4-7	7
21	5	1195	74	194	315	328	1.26	80	2-4-3-3-12	H	4-10	9
5 HEIFERS AVERAGED				198	384	410	1.59	101				
34	4	1315	8	214	445	450	1.75	96	3-3-2-3-14	B	3-21	9
16	4	1200	1	224	470	457	1.79	97	4-2-3-4-16	B	3-11	8
15	5	1090	2	221	505	473	1.97	100	4-2-3-4-16	B	3-14	6
13	5	1220	3	221	505	473	1.97	100	5-3-4-4-16	B	3-14	8
52	3	1195	4	216	550	578	2.22	123	3-3-4-3-15	B	3-19	7
4	5	1340	13	208	470	464	1.92	98	3-2-4-4-15	B	3-27	8
6 BULLS AVERAGED				217	490	482	1.94	102				
ENTIRE HERD AVERAGED BY SEX												
6 HEIFERS AVERAGED				201	388	407	1.59	100				
7 BULLS AVERAGED				216	476	470	1.88	100				

LISTED BELOW ARE IRREGULAR CALVES  
 (AGE WAS NOT BETWEEN 160 AND 250 DAYS)

PROGENY OF SIRE NO. 225

DAM INFORMATION			CALF INFORMATION			205LB	ADG	RATIO	GRADE F-M-C-S	S	BORN	CCR
ID NO.	AGE	LBS	ID NO.	AGE	LBS							
73	12	1210	82	153	360	481	1.90	118		H	5-21	8

PROGENY OF SIRE NO. 858

DAM INFORMATION			CALF INFORMATION			205LB	ADG	RATIO	GRADE F-M-C-S	S	BORN	CCR
ID NO.	AGE	LBS	ID NO.	AGE	LBS							
42	4	1105	83	157	300	388	1.46	95		H	5-17	8
78	7	1165	84	152	320	407	1.64	100		H	5-22	8

station, and at some extension offices. You can process your performance test data with this equipment. The results are printed in a form to simplify herd selections.

### PROGRAM COST

It is suggested that each participant become a member of the Minnesota Beef Cattle Improvement Association. Each producer will be assessed a \$5 enrollment membership fee by the Beef Cattle Improvement Association. This fee will be used to promote statewide performance testing programs. Processing charges will be 25¢ per calf. The fee is used for secretarial salaries, computer costs, and material needs. Checks should be made payable to the Minnesota Beef Cattle Improvement Association. If local teletype equipment is used, the producer must pay the telephone charges plus the regular program charges.

Official graders are available throughout the state. Each grader should be paid for his expenses plus a minimum service charge.

### ENROLLMENT

Contact your extension agent who will officially enroll you in the Minnesota Beef Improvement Program. Fill out an application blank and send it to: Minnesota Beef Improvement Program, 101 Peters Hall, University of Minnesota, St. Paul, MN 55101.

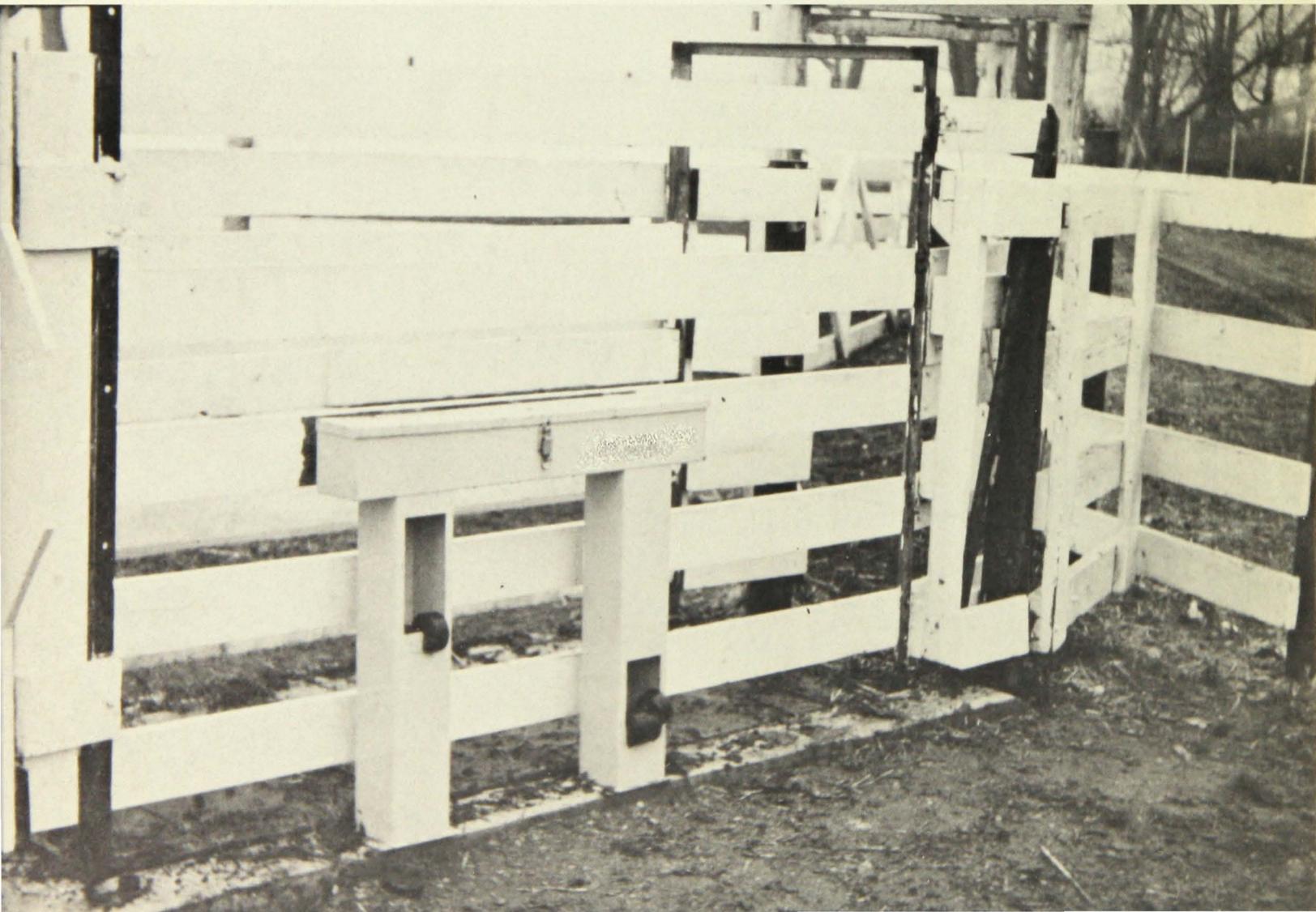
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Roland H. Abraham, Director of Agricultural Extension Service, University of Minnesota, St. Paul, Minnesota 55101. We offer our programs and facilities to all people without regard to race, creed, color, sex, or national origin.

A chute system is necessary for ease of handling cattle. It should be located in a convenient place with adequate holding pens. →

Permanent scales as part of the cattle chute system add to the efficiency of working cattle. Calf and cow weights are essential to evaluate cow efficiency. ↓





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APPLICATION TO ENTER THE MINNESOTA BEEF IMPROVEMENT PROGRAM

BREEDER'S NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_ ZIP \_\_\_\_\_

LOCATION OF FARM \_\_\_\_\_ COUNTY \_\_\_\_\_

BREED OF CATTLE \_\_\_\_\_ NO. CALVES TO BE TESTED \_\_\_\_\_ PHONE NUMBER \_\_\_\_\_

WEANING DATE (average 205 days) \_\_\_\_\_

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