



# Hip Height and Frame Score Determination

Sally L. Dolezal  
Extension Beef Cattle Breeding Specialist

Nakita Coe  
Communications Intern

Oklahoma Cooperative Extension Fact Sheets  
are also available on our website at:  
<http://osufacts.okstate.edu>

Live animal evaluation takes into consideration any subjective measurements that help describe an animal. Some common measurements of cattle include backfat, pelvic area, scrotal circumference, height at the shoulder, height at the hip, and length of body.

In recent years, height measurements have become a descriptive supplement to many herd testing programs. Linear measurements for height have added another dimension to evaluating the lean-fat ratio of an individual animal. How much emphasis breeders should place on linear measurement should depend on their goals relative to type of cattle desired. A linear measurement should never be interpreted as a replacement for the weight of an animal at a given age.

## Frame Score

Frame score is a convenient way of describing the skeletal size of cattle.

The Beef Improvement Federation Guidelines (1996) define frame score as follows:

*Frame score is a score based on subjective evaluation of height or actual measurement of hip height. This score is related to harvest weights at which cattle should attain a given quality grade or attain a given amount of fat thickness.*

Frame score of an animal is determined by mathematical equations that use age and height as variables. No one frame size for an animal will be best for all feed resources, breeding systems, and feed costs. Reproductive efficiency and projected market weight will determine the optimum frame size range within a given set of feed resources, breeding systems, and production costs.

With adequate height growth curves, most animals should maintain the same frame score throughout their life while their actual height increases with age. Frame size can be influenced by nutritional management. Frame score is easily determined if age and height in inches are available (Tables 1 through 4). Estimates of cattle heights and corresponding frame scores are given for bulls and heifers (5 to 21 months), as well as mature bulls and cows (24 to 48 months). Bull height estimates may be used to approximate steer frame

values.

The recommended point for linear measurement of hip height is over the hooks and hip bones (Figure 1). Hip heights should not be used as a replacement for other performance data. Although no one frame size is best for all producers, hip heights or frame scores do provide supplemental information for the breeder and the buyer. Hip heights should be measured in inches directly over the hooks (hip bones) with the animal standing on a level surface. To make accurate comparisons, age should be considered when measuring hip height. For additional information regarding hip height adjustments on postweaning bulls, see OSU Extension Facts F-3002 *Postweaning Evaluation Programs for Beef Bulls*.

Frame score tables are recommended by the Beef Improvement Federation. Individual breed associations have developed their own frame score charts. A producer who is interested in one breed should contact that particular breed association.

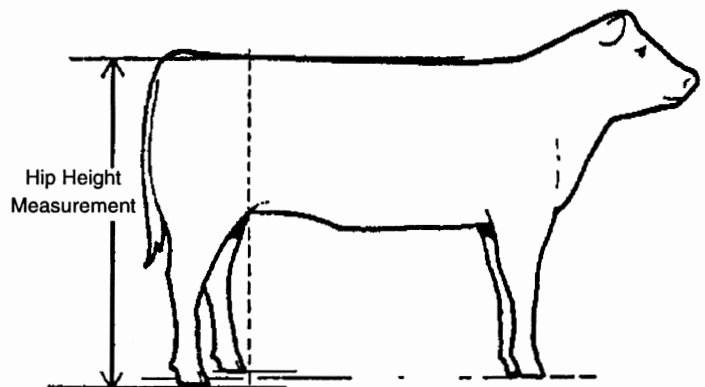


Figure 1. Height Measurement.

The hip height measurement should be taken at a point directly over the hip bones (hocks) with the animal standing on a level surface.

**Table 1. Bull Hip Height (inches) Frame Score for Ages 5 to 21 Months.**

Age in Months	Frame Score								
	1	2	3	4	5	6	7	8	9
5	33.5	35.5	37.5	39.5	41.6	43.6	45.6	47.7	49.7
6	34.8	36.8	38.8	40.8	42.9	44.9	46.9	48.9	51.0
7	36.0	38.0	40.0	42.1	44.1	46.1	48.1	50.1	52.2
8	37.2	39.2	41.2	43.2	45.2	47.2	49.3	51.3	53.3
9	38.2	40.2	42.3	44.3	46.3	48.3	50.3	52.3	54.3
10	39.2	41.2	43.3	45.3	47.3	49.3	51.3	53.3	55.3
11	40.2	42.2	44.2	46.2	48.2	50.2	52.2	54.2	56.2
12	41.0	43.0	45.0	47.0	49.0	51.0	53.0	55.0	57.0
13	41.8	43.8	45.8	47.8	49.8	51.8	53.8	55.8	57.7
14	42.5	44.5	46.5	48.5	50.4	52.4	54.4	56.4	58.4
15	43.1	45.1	47.1	49.1	51.1	53.0	55.0	57.0	59.0
16	43.6	45.6	47.6	49.6	51.6	53.6	55.6	57.5	59.5
17	44.1	46.1	48.1	50.1	52.0	54.0	56.0	58.0	60.0
18	44.5	46.5	48.5	50.5	52.4	54.4	56.4	58.4	60.3
19	44.9	46.8	48.8	50.8	52.7	54.7	56.7	58.7	60.6
20	45.1	47.1	49.1	51.0	53.0	55.0	56.9	58.9	60.9
21	45.3	47.3	49.2	51.2	53.2	55.1	57.1	59.1	61.0

Frame Score =  $-11.548 + 0.4878(Ht) - 0.0289(\text{Days of Age}) + 0.00001947(\text{Days of Age})^2 + 0.0000334(Ht)(\text{Days of Age})$  Equation should only be used for bulls between the ages of 5 and 21 months.

**Table 2. Mature Bull Hip Height (inches) Frame Score.**

Age in Months	Frame Score										
	1	2	3	4	5	6	7	8	9	10	11
24	46.4	48.3	50.3	52.3	53.9	56.0	58.0	60.0	62.0	64.0	66.0
30	47.3	49.3	51.3	53.2	54.9	57.0	59.0	61.0	63.0	65.0	67.0
36	48.0	50.0	51.9	53.8	55.5	57.5	59.5	61.5	63.5	65.5	67.4
48	48.5	50.4	52.3	54.1	55.9	58.0	60.0	62.0	63.9	65.8	67.7

**Table 3. Heifer Hip Height (inches) Frame Score for Ages 5 to 21 Months.**

<i>Age in Months</i>	<i>Frame Score</i>								
	1	2	3	4	5	6	7	8	9
5	33.1	35.1	37.2	39.3	41.3	43.4	45.5	47.5	49.6
6	34.1	36.2	38.2	40.3	42.3	44.4	46.5	48.5	50.6
7	35.1	37.1	39.2	41.2	43.3	45.3	47.4	49.4	51.5
8	36.0	38.0	40.1	42.1	44.1	46.2	48.2	50.2	52.3
9	36.8	38.9	40.9	42.9	44.9	47.0	49.0	51.0	53.0
10	37.6	39.6	41.6	43.7	45.7	47.7	49.7	51.7	53.8
11	38.3	40.3	42.3	44.3	46.4	48.4	50.4	52.4	54.4
12	39.0	41.0	43.0	45.0	47.0	49.0	51.0	53.0	55.0
13	39.6	41.6	43.6	45.5	47.5	49.5	51.5	53.5	55.5
14	40.1	42.1	44.1	46.1	48.0	50.0	52.0	54.0	56.0
15	40.6	42.6	44.5	46.5	48.5	50.5	52.4	54.4	56.4
16	41.0	43.0	44.9	46.9	48.9	50.8	52.8	54.8	56.7
17	41.4	43.3	45.3	47.2	49.2	51.1	53.1	55.1	57.0
18	41.7	43.6	45.6	47.5	49.5	51.4	53.4	55.3	57.3
19	41.9	43.9	45.8	47.7	49.7	51.6	53.6	55.5	57.4
20	42.1	44.1	46.0	47.9	49.8	51.8	53.7	55.6	57.6
21	42.3	44.2	46.1	48.0	50.0	51.9	53.8	55.7	57.7

Frame Score =  $-11.548 + 0.4878(\text{Ht}) - 0.0289(\text{Days of Age}) + 0.0000146(\text{Days of Age})^2 + 0.0000759(\text{Ht})(\text{Days of Age})$  Equation should only be used for heifers between the ages of 5 and 21 months.

**Table 4. Mature Cow Hip Height (inches) Frame Score**

<i>Age in Months</i>	<i>Frame Score</i>										
	1	2	3	4	5	6	7	8	9	10	11
24	43.1	45.0	46.9	48.8	50.7	52.5	54.5	56.5	58.2	60.1	62.0
30	43.8	45.8	47.5	49.4	51.3	53.1	55.1	57.0	58.9	60.8	62.5
36	44.2	46.1	48.0	49.8	51.8	53.6	55.5	57.2	59.2	61.0	62.8
48	44.6	46.5	48.2	50.0	52.0	53.9	55.8	57.5	59.4	61.2	63.0

## **The Oklahoma Cooperative Extension Service** *Bringing the University to You!*

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

### **Reference:**

Beef Improvement Federation (BIF) Guidelines. 1996. Seventh edition. pp. 17-20.

Original Publication was written by Charles McPeake.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, gender, age, religion, disability, or status as a veteran in any of its policies, practices, or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 20 cents per copy. 0607