



# Grass-Fed Beef Initiative Extension Series

Fact Sheet 1 of 11

## The Power of Genetics: Selecting Breeding Stock for Grass-Fed Beef

One of the most frequently asked questions concerning grass-fed beef genetics is: “What breed(s) of cattle are the best for grass-fed beef production?” The truth is, no single breed can be identified as the answer to high quality grass-fed beef. All breeds have strengths and weaknesses, so sound genetic selection is best accomplished by examining bloodlines within breeds for the characteristics desired.

### Profitable and Functional Beef Cow Traits

The first thing to consider is the traits that make a beef cow functional and profitable. Data collected in the National Cattlemen’s Beef Association Integrated Resources Management (IRM) program show that the average beef cow only has about four calves before she is culled. However, the average beef cow does not break even, in terms of investment, until she has had her fifth calf. This means that the average cow never makes any money. Therefore, longevity is the single most important trait influencing profitability. After longevity, come fertility, structural soundness, and adaptability. If an animal is lacking in any of these traits, they will not possess longevity. If they lack adaptability, they will break down, fail to breed or rebreed, or fail to maintain adequate body condition. If fertility is subpar, then cows will skip one or more calves during their lifetime. If they have issues with feet and legs, eyes, or udders and teats, then they will not stay in the herd very long.

After selecting for the above traits first and foremost, you can concentrate on selection for traits that affect ability to finish on forage, produce a high quality carcass, and a desirable eating experience. Your primary goal should be to produce cattle that can make a profit no matter what market they are sold into. Functional cattle will always have a place in the beef industry and will be in increasing demand.

### Seedstock Review

As a general rule, the breeds of cattle that work best for grass-fed production are British breeds and crosses utilizing British breeds. However, there are cattle within other breed types that will work as well. Start by determining what breed, or breeds, you are most interested in.

Then, research the seedstock breeders within your region who are producing genetics that have been working for other grass-fed beef producers or grass-fed beef branded programs. Talk with other grass-fed beef producers and peruse the publications that are focused on grass-based production. Many of the top grass-based genetics seedstock providers routinely advertise in these publications.

Once you have identified seedstock breeders that may possess the genetic base you desire, pay them a visit. This needs to be an extended visit where you request a tour of their entire operation. You want to see all their cattle, not just the yearling bulls and heifers for sale. How well do they manage their pastures? What kind of body condition are the cows in? Do they rely on creep feeders for the calves? Are they supplementing the cow herd heavily or routinely, or are they forcing their cows to rely primarily on forage? What is the average age of the cows in their herd? If they do not have any old cows, then what is your assurance of longevity? Do they manage their herd similarly to the way you manage your herd? How uniform in phenotype are the cows in their herd? Do they have a sound genetic selection program and consistency in their genetics, or are they relying heavily on outcrossing? How sound are the cattle in terms of feet and legs, eyes, udders and teats? A good time to evaluate soundness of udders and teats in a seedstock herd is to schedule a visit shortly after the calving season when cows are heavily lactating.



Picture 1: Desired bull phenotype

After you have thoroughly reviewed the seedstock cattle in person, ask to see any and all performance and pedigree data on the cattle. Most people would tell you that this advice is backwards, that you should review the data first, then go look at the cattle. However, this often clouds a person's opinion and they get bogged down in the details of data and don't ever really see the cattle. Look at the cattle first. If they fit what you are looking for phenotypically, then ask to see the data. If they do not fit what you are seeking phenotypically, no need to bother with reviewing data. Instead, move on to the next seedstock breeder.

Ask to see actual performance data, not just Expected Progeny Differences (EPDs). The actual performance data tells you what the cattle are truly doing and not simply what they are projected to do. What was their birth weight? Weaning weight? Gain performance data on grass? Carcass performance data on related relatives? Average live weight at harvest? Ultrasound data?

All can be important indicators of how the seedstock will impact performance in your herd. EPDs should be used very judiciously. It is important to remember that selecting for EPDs that are in the top 10 per cent of the breed for any given trait(s) often results in selecting for cattle that are extreme in one or more traits. For cattle that perform well on grass and are moderate framed, efficient animals, stick with EPDs that are middle of the road.

### Phenotype Characteristics

What are the phenotypic characteristics of sound, efficient grass based genetics cattle? First, mature cows and bulls should be very moderate framed, with Beef Improvement Federation (BIF) Frame Scores between 3.0 and 5.5. This means mature cows and bulls (4 years old or older) will have hip heights measuring between 52 and 56 inches (1.3 and 1.4 metres) for bulls and between 48 and 52 inches (1.2 and 1.3 metres) for cows (*Guidelines for Uniform Beef Improvement Programs*, Ninth Edition, 2010. Chapter 3, pg. 28-30. Beef Improvement Federation).

In addition, grass-based cattle should be very deep bodied, with tremendous gut capacity and spring of rib, average to thick muscling, and possessing a wide muzzle. Bulls should be very masculine in appearance with a nice crest to the neck, thick in the shoulders and forequarter, deep in the heart girth and flank, sound on feet and legs, and possess great depth of body (Picture 1).



Picture 2: Desired cow phenotype

In contrast, cows should be quite feminine in appearance, being very clean and lean about the head, neck, and shoulders and exploding back in a wedge shape from front to rear (Picture 2). The phenotypically sound cow should also exhibit depth in the heart girth and rib with a slight slope in the hips between the hooks and the pins. When viewed from behind, highly fertile, functional bulls will have well sprung ribs with the lower rib region being the widest part of the body (Pictures 3-4).



Picture 3: Cow viewed from the rear





*Picture 4: Desired gut capacity in the cow*

In cows, the largest diameter of the body should be the mid-rib region, exhibiting tremendous gut capacity (Pictures 5-6). Generally, when cattle meet the described phenotypic characteristics they also tend to perform well in gain on forage and in the carcass, exhibiting good to excellent carcass quality when finished on forage.



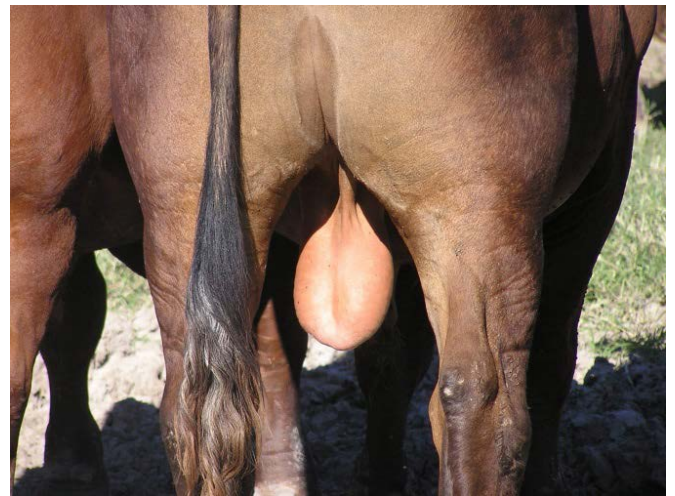
*Picture 5: Bull viewed from the rear*



*Picture 6: Desired gut capacity in the bull*

Do not forget that bulls and cows must function optimally from a fertility standpoint and that cows must be able to nurse a calf without human intervention. Make sure that all bulls you purchase have excellent testicular development and orientation, are free from abnormalities, and are fertility tested annually. Scrotal circumference should meet or exceed minimum standards by age and bulls should pass fertility examination requirements for sperm cell motility, morphology, and concentration.

(<http://www.iowabeefcenter.org/Beef%20Cattle%20Handbook/Breeding-Evaluations.pdf>).



*Picture 7: Proper testicular shape and orientation*

Testicular length is equally important as circumference. Both testicles should be equal in length and oriented properly. There should be no torsion or twisting exhibited (Picture 7). Testicles should be free from adhesions, lesions and abscesses, and be able to respond to thermoregulation by being drawn up close to the body when temperatures are cold and relaxing and descending from the body when temperatures are hot. The epididymis should be clearly visible at the bottom of each testicle. In addition, there should not be a deep division or "V" between testicles at the lower region of the scrotum.

For cows to be reproductively functional for many years, they must possess excellent udder attachment and properly sized teats. Cows that have structural issues with udders and teats simply will not, or should not, last in a highly selected herd. Following BIF guidelines for udder suspension and teat size scores, you will want to select both replacement bulls and heifers from females that score a 7 or higher on both udder suspension and teat size, on a scale of 1 to 9.

(<http://www.beefimprovement.org/content/uploads/2013/07/Master-Edition-of-BIF-Guidelines-Updated-12-17-2010.pdf>).

Udder and teat scores should ideally be taken within 24 to 48 hours after calving. (Picture 8 illustrates proper udder suspension and teat size in a cow.)



Picture 8: Desired udder suspension and teat size

In summary, to select genetics that will work well within your environment and management, purchase bulls and heifers from seedstock breeders who have similar philosophies and management style. If they pamper their cattle, do not expect those cattle to work well for you in a pasture environment. Select seedstock cattle from breeders who place a high degree of emphasis on longevity, fertility, adaptability, and soundness. If cattle possess the desired phenotype and are highly functional, then the other traits will follow.

#### For more information

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