

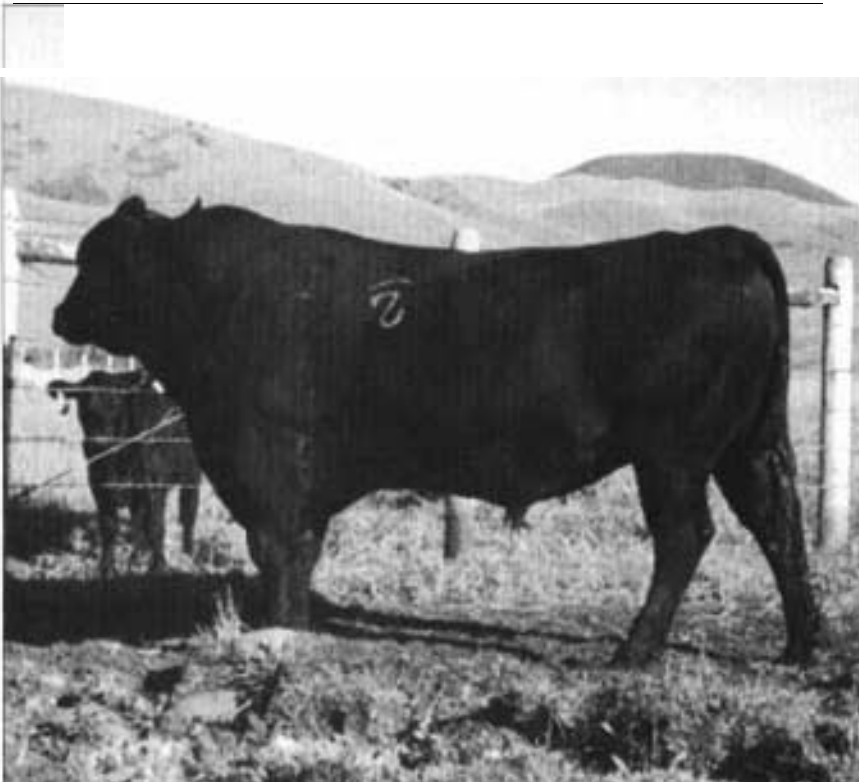
# Don't Overlook Visual Appraisal

BY HEATHER SMITH THOMAS

Careful bull selection is crucial to the future genetics of your cow herd and to the salability of your calves. Expected progeny differences (EPDs), especially those with high accuracies, are invaluable tools in identifying genetics for growth, milk, birth weight, etc. — all the measurable traits you want to maintain or improve in your cow herd or calves. But, just as important as looking at EPDs, pedigrees and actual performance is examining each bull prospect visually

for structural correctness (or structural faults) and evaluating his breeding soundness and fertility.

No matter how good his performance record is, a bull won't be any good unless he can breed and settle cows. His future as a sire depends on his reproductive development and performance. His breeding ability will affect the reproductive performance of his offspring since some fertility factors are heritable.



So in addition to looking at the data, before you buy, evaluate your bull prospects by:

| Visual examination to determine structural strengths or faults and any obvious problems that might affect breeding ability;

| Veterinary examination to evaluate semen quality and assess reproductive tract health; and

| Evaluation of willingness and ability to breed a cow.

## VISUAL EXAMINATION

Structural soundness should be looked at from the ground up. Feet and legs are of vital importance. Bad feet, pigeon toes, long toes, straight hocks (post-legged) and loose sheaths are some of the more common structural problems, says Duane Mickelsen, Department of Veterinary Clinical Medicine and Surgery at Washington State University. Carefully inspect feet, toes, heels, pasterns, knees, hocks, sheath and testicles.

Watch the bull as he moves to see if he travels well, advises Mickelsen. He should move freely with some flex to the knees and hocks. If he walks "funny" at all, there could be a structural problem. Each foot should strike the ground evenly, with hind feet following in the tracks of the front feet and no swinging inward or outward.

Hind leg conformation is very important. Most of a bull's weight will be on his hind legs when mating, so they must be well-formed and strong. A bull with a hind leg impairment may not travel to find cows in heat or be able to keep up the activity necessary to court and breed a large number of cows. Some bulls with hind leg problems will mount cows but won't breed them because of rear leg discomfort, says Mickelsen.

To be athletic, travel well and service cows, a bull needs the proper angle to his feet and legs. If his hind legs are too straight (post-legged) or there's too much angle (sickle-hocked), the bull may be more susceptible to foot injury.

If a bull is too straight in the shoulder, pasterns and hind legs (post-legged), he will have problems. This type of bull often has a short, choppy stride; carries his weight on his toes; and may have small feet, says Mickelsen. This conformation may make him buckle at the knee. Post-legged bulls

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often suffer stifle injury or hock problems.

Because there's not as much cushion or angle to their structure, straight-shouldered and straight-hocked cattle actually stand taller than cattle with the same length of bone but a better structure. Don't let that height fool you. It's still poor structural conformation.

Too much angle in the hind leg (sickle-hocked) puts too much weight on the heels, in which case the heels are often shallow and toes grow long because they don't wear normally.



**Duane Mickelsen**

The ideal foot has a strong, deep heel and well-formed hooves. If one toe is obviously wider or longer than the other, there is probably uneven weight distribution caused by conformational

faults further up the leg, says Mickelsen. The result is uneven wear and abnormal hoof growth. In most of these cases, foot trimming is needed.

As a bull with poor hind leg conformation ages, the problem becomes more apparent and tends to increasingly interfere with his breeding ability. This type of bull is a poor risk because he not only sires fewer calves, but his structural faults are likely to be passed on to his offspring.

**Other feet and leg problems** (apart from inherited conformation faults) can stem from overfeeding a bull when he is young and growing, says Mickelsen. "Bulls that have been pushed to gain 4 to 5 pounds (lb.) a day are at risk of founder. And if a bull is overfed you should really question his breeding ability."

An over-conditioned bull has too much stress on his immature skeleton. Growing bones and joints can be permanently damaged by the extra weight.

"If a bull on a hot ration goes off feed even just a little, he may founder, causing foot problems later. He won't be able to travel," says Mickelsen.

### SCROTAL SHAPE AND CIRCUMFERENCE

Scrotal size and shape are good indicators of fertility. Exact size can be measured, but you can usually tell by visual inspection whether or not a bull is adequate.

Shape is important, too, since a bull has to be able to raise and lower his testicles for proper temperature control.

The testicles should hang down well away from the body in warm weather. There should be an obvious neck at the top of the scrotum with the testicles hanging down large and pear-shaped. A bull with a straight-sided scrotum or a "Y-shaped" scrotum is often not as fertile as a bull with a normal scrotum, says Mickelsen.

Don't choose a bull with odd-shaped testicles (one obviously smaller than the

other) and note any abnormalities, he adds. "Scabby, thickened skin, especially on the back or bottom third may indicate frostbite, which can cause temporary or permanent infertility, depending on the extent of damage and scarring."

**Testicle size** is an excellent indicator of fertility since a significant correlation exists between scrotal circumference and sperm cell volume and percent normal sperm, says Mickelsen. There is also a strong genetic correlation between scrotal size in bulls and the fertility (as measured by age of puberty) of their daughters.

Bulls measured at 1 year of age should have a scrotal circumference of at least 32 centimeters (cm), preferably 34-36. For best fertility, and to ensure high fertility in a bulls offspring, select bulls with above-average scrotal circumference.

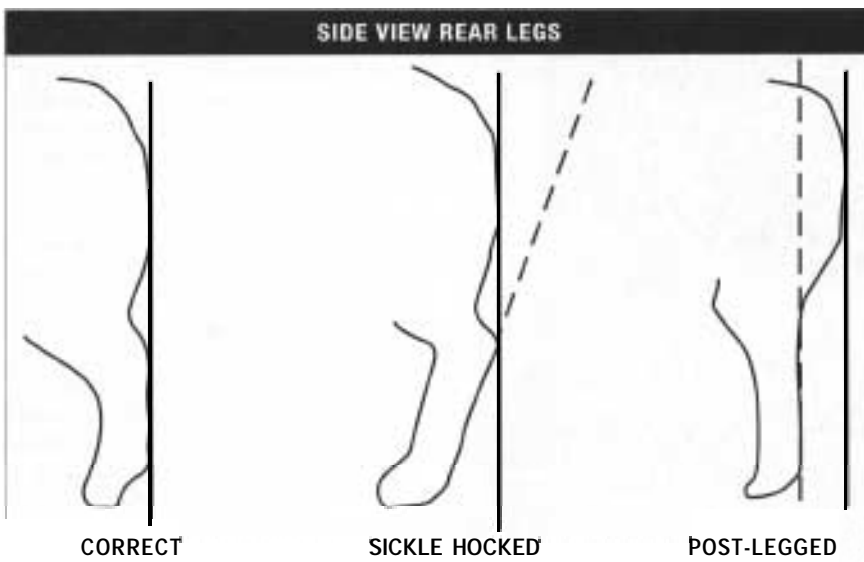
Bulls with small testes not only have lower sperm production but often suffer from other problems that make them sub-fertile or infertile, according to Mickelsen. Infertility associated with small testicles often results from incomplete development or underdevelopment of these organs and/or testicular degeneration, he says.

In fact, some bulls with a scrotal circumference of 29 cm or less may produce no sperm at all. Bulls with smaller-than-average testicles may be fertile at first, even for a year or two, then eventually become less fertile or completely sterile because the tubules within the testicles degenerate earlier and at a more rapid rate than in a normal bull.

There also tends to be more abnormal sperm in the semen of bulls with small testes, probably because of early testicular degeneration, says Mickelsen. Keep in mind that all types of testicular underdevelopment are heritable.

### VETERINARY EXAMINATION

A semen check and physical examination of the bull's reproductive tract by a veterinarian during a breeding soundness exam (BSE) will help tell if a bull will be a satisfactory breeder. The veterinarian will check for adhesions caused by injury or bruising in the sheath or penis and any abnormalities that might interfere with breeding. The veterinarian should also examine and palpate the scrotum, testes and epididymides.



Some bulls may have one testis only partially descended into the scrotum, and some may have scrotal hernias. Normal testes and epididymides are usually symmetrical, says Mickelsen. View any deviation in size, shape or relative position with suspicion.

The veterinarian will also check for tumors and enlargements due to inflammation or abscesses.

A semen check will indicate whether the bull has adequate numbers of live sperm and whether he has a high or low percentage of abnormal sperm. If a bull has a high prevalence of a specific sperm abnormality, he is usually infertile, says Mickelsen.

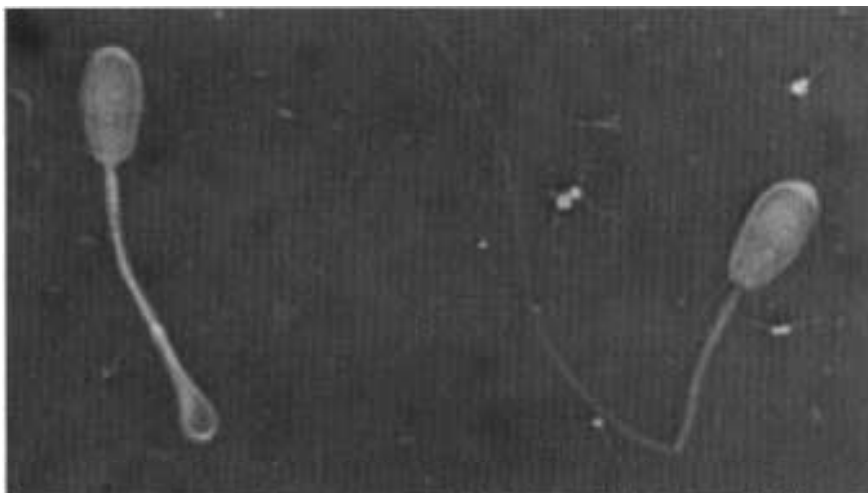
A high number of abnormal sperm may mean the bull is sexually immature or that there are degenerative changes in the testes. Abnormal sperm usually decrease as the young bull matures or his testes become larger. A bull that does not show normal sperm evaluation by 18 months of age is a poor risk as a breeder.

Jim White, who manages the Northwest Bull Test at Parma, Idaho, says all the bulls going through this test are semen checked as yearlings. There can be a lot of change in a bull between 12 months and 16 months of age, he observes. "Some of these bulls won't pass the test as yearlings — they are too immature," he says.

Out of 100 bulls there will often be about 10 that don't check out, says White. "There will be some with a problem, such as small testicles or a soft testicle, but some bulls just need to be rechecked in a few months. Many will be OK in their sperm production by then."

White also says producers can go too far in relying on just a semen check. Conditions can vary (bad weather, cold or hot weather, or other stresses), temporarily affecting a bulls test score.

Mickelsen says one factor that can cause a temporary increase in sperm abnormality (and thus decrease fertility) is heat stress. About two weeks after experiencing heat stress, abnormal sperm will appear in the semen and the number of abnormal sperm will continue to increase for up to a month later. After that, the sperm will become more normal again, unless the heat stress continues for a period of time, in which case recovery will take longer. Heat stress in July through early August may make a bull infertile through September, reaching full recovery as late as December.



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Fever can do the same thing, as may be the case if a bull suffers from some type of illness or foot rot. He will have a period of infertility following the time when sperm production was adversely affected by the fever.

#### LIBIDO AND MATING ABILITY

Structural soundness and outstanding semen still can't classify a bull as a satisfactory breeder if he can't mount and service a cow. Libido, or sex drive, is a vital part of fertility and has little or no relationship with other traits such as semen quality.

Libido is defined as the willingness and eagerness to mount and service a cow. Mating ability is defined as the ability to complete the service. Deficiencies in either can seriously limit a bull's ability to sire calves.

Though an important aspect of a bull's breeding ability, libido is difficult to evaluate during a breeding soundness exam. The bull must be observed with cows.

Young bulls must learn to identify cows in heat. It's always a good idea to expose young bulls to a few cycling cows before the breeding season to evaluate their breeding ability.

Shy breeders, fighters (preferring to fight other bulls rather than breed the cows), bulls that stay with one cow and ignore others in heat, and bulls with poor sex drive or poor mounting ability will not sire very many calves.

Strong sex drive or lack of it often has a genetic basis, but other factors may be involved, says Mickelsen. Some bulls raised in all-male groups may show temporary low libido, as will bulls that have been overfed. Bulls in poor condition, or suffering from disease, pain or stress (handling or environmental) will also show decreased libido.

Mating ability can be impaired by lameness, rear leg unsoundness or back problems. Penile abnormalities and injuries can reduce mating ability. And, if there is more than one bull in a breeding pasture, social dominance can also be a factor.

A breeding soundness exam gives a good clue to a bull's potential, but the only true test of his breeding ability is in the breeding pasture — where cows are bred and settled. A careful evaluation of the bull beforehand, however, can often help you avoid choosing a bull with problems that may interfere with his future as a sire.

#### CONDITION

When evaluating a bull, look at his overall condition. A bull too thin may not be able to handle the stress of breeding season. A bull too fat won't have the athletic ability and stamina to breed a lot of cows. He'll be sluggish and will tire easily, warns Mickelsen.

Young bulls that have just completed weight gain performance testing are usually too fat, which interferes with their performance as breeders and can also

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hinder fertility — since fat in the testicles provides too much insulation for proper temperature control necessary for sperm production and viability. These over-conditioned young bulls may also lose weight too rapidly their first breeding season (see related story on page 168).

To avoid these problems, an over-conditioned young bull must be allowed at least a two-month “let down” period on a high-roughage diet before being used for breeding, advises Mickelsen. Even then,

some of the overly pampered bulls will not do well at pasture breeding cows, he adds.

Overly fat young bulls often top the bull sales but are a disappointment in the breeding pasture. One of the first tests dealing with this problem was at a research station in Lethbridge, Alberta, Canada, studying Hereford and Angus bulls fed up to 2 years of age on hot rations. The study was initiated because of reports from several bull studs that overly fat bulls were having

reproductive problems. These were bulls that had been through performance testing, pushed to grow as fast as possible.

Results of the Lethbridge study showed more problems with bulls on high-energy rations than those on maintenance rations. The bulls on high-energy feed had 45% fewer sperm cells than bulls on a lower plane of nutrition.

The researchers found excess fat in the testes of the overfed bulls. The fat acts as insulation, keeping the testes too warm for ideal sperm production and storage, resulting in poor sperm production and shorter sperm life. (This is the same reason a short scrotum can cause infertility: The testicles are held too near the body and are too warm for proper sperm production.)

Researchers conducting the Lethbridge test found there to be 32% more fat in the scrotum of bulls on hot rations. There was no significant difference between bulls on maintenance rations and the bulls that had been “let down” to regular rations after performance testing, if enough time had elapsed to correct the problem.

Field trials were also done in the early 1980s in Canada, studying about 300 bulls (yearlings, 2-year-olds and 3-year-olds of several breeds and some crossbreds) being used in community pastures. Glenn Coulter, who worked on this study and the Lethbridge study, says everything pertaining to fertility was measured on these bulls before and after the breeding season. He says when the bulls were first turned out “only 40% passed their breeding soundness exams. But, later in the season, after being on pasture, 70% were passing the exam, mainly because they had lost weight.”

The researchers took a close look at five factors contributing to fertility, including backfat thickness, and found that the fatter the bulls, the fewer calves they sired.

“Greatest fat thickness was 7 millimeters (0.27 inches), and most bulls were between 0 and 4 or 5 (0.16 or 0.20 inches) — not at all fat by anyone’s standards,” says Coulter. These bulls were breeding under range conditions. The researchers blood-typed the bulls, cows and calves to identify the sires of the calves afterward. The leaner bulls turned out to be the best breeders.

“They were more athletic and didn’t suffer the general stress of carrying extra weight around,” says Coulter. The result: They sired more calves.

Ron Bolze, former Kansas State University beef Extension specialist (see

### THE NEED FOR ADEQUATE BUT MODERATE DIET

**Bruce Carpenter, Extension livestock specialist at Fort Stockton, Texas, says bulls should be in good physical condition, not too thin nor too fat. “This means good muscle tone and fitness and about a score 5 or 6 in body condition (9-point scale) — smooth, with no ribs showing, but no accumulated fat. Essentially, the bull must function as an athlete.**

“Nutrition is particularly important during prepubertal development, from weaning to 15-16 months of age. A good plane of nutrition can hasten puberty in young bulls and enable them to more completely express genetic growth potential.

“Severe underfeeding can cause irreversible testicular damage,” he says. “Getting them excessively fat can impair ability to travel and decrease sperm production and libido. “Research at Texas A&M University has shown that additional dietary energy given to young bulls can speed the process of pubertal development, but there are limits,

**Feeding bulls to gain about 1 pound per day appeared to optimize onset of puberty, compared to lower rates of gain of one-half**

**pound per day.” The study showed there was no specific percentage of body fat that influenced onset of puberty. It was more influenced by rate of weight gain.**

He says many bulls are evaluated for growth potential in full-feed tests (usually lasting about 140 days) or forage tests (lasting about 10 months). “Each method has its advantages, but with regard to a bull’s suitability for immediate breeding use, the forage test is preferable because it minimizes chances of getting bulls too fat.” If you need to buy a bull just before the breeding season, it is very important to look for one that has been raised under more natural conditions.

Carpenter says that Canadian research shows “that energy provided by high-quality

forage is superior to energy provided by high-energy diets (grain plus forage) for maximizing sperm production and sperm reserves in young bulls.”

Over-fat bulls often “fall apart” when turned out to breed cows, partly because their digestive systems are not able to handle the change. It takes time for the rumen to adapt — for the population of microorganisms to change from ones that can digest grain to ones that digest roughage. As stated by Carpenter, “this usually takes about 2 to 3 weeks.

“Also, over-fat bulls may have been maintained in confinement and are not physically accustomed to traveling for grazing and water,” adds Carpenter. “And they may develop sore feet if they have to travel through rocks.” They need time to adjust to the new environment and become more physically fit and toughened in.

As Duane Mickelsen, Washington State University (WSU) veterinarian, points out, pampered young bulls do not want to have to work for their feed. They’ve had high-quality feed put in front of their noses all their young lives, and they can’t understand why they now have to go find their own food. The harsh reality of the real world is tough for them to take, and many just won’t graze enough to keep from losing weight.



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page 128), says historically the bulls that go through feed trials have been overfed and that those gaining more than 4 lb./day post-weaning “often have reduced fertility and reduced longevity due to feet and leg problems. These bulls lose condition too fast when turned out to breed cows.

“Now that we have good genetic information like yearling weights and EPDs — a better indicator of growth potential than post-weaning test gain -why overfeed them?” he asks.

Bob Neumeyer of Jaynbee Angus, Bonners Ferry, Idaho, says that “a fat bull is not a long-lived bull. If you can feed a bull for growth but not get him fat, he will come off a range situation in much better shape than the fat bull.”

Neumeyer feeds brewer's grain and timothy hay to his young bulls, making sure they get plenty of roughage. He sells about 100 yearlings and 25 2-year-olds annually, at sales and by private treaty, and runs his cows on native pastures where they have to work for a living. He grows his yearling bulls in large five-acre lots and the 2-year-olds in a 15-acre pasture, shooting for average daily gains of 3 lb.

“To test a bull's ability you don't have to push him,” says Neumeyer. “They will still sort themselves out. If you have an average of 3 pounds of gain, then you know the ones that gain above average are exceptional. You can get a good feel for what a bull can do in this type of program without pushing for high gains.”

White says most bull test centers pick the sale order by how the bulls gained on test. However, he doesn't overemphasize gain. The bulls in his test are fed chopped hay, rolled corn, corn silage and a vitamin-mineral pack.

“When picking the calves to feed, and when selling them, we look at structural soundness, EPDs and pedigree — the whole picture — instead of looking for the animal that gains the best,” he says. “Most of our buyers need bulls that can work in range conditions, and if a bull isn't sound, they don't want him.

“We've never had a problem with soundness, and we don't trim feet. The ration we originally set up was for a 2.5-pound daily gain, but with the genetics we have now, these bulls are gaining 3 pounds on the same ration,” says White. “We want them to gain 3 to 3.25 pounds a day, but we aren't looking for more than that. We want moderation.”

