



# Cattle Producer's Handbook

Reproduction Section

435

## Bull Management Before the Breeding Season

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To better understand management of bulls, the year can be divided into three seasons: (1) pre-breeding or conditioning, (2) breeding season, and (3) post-breeding season or rest and recuperation. While the length of each segment may vary from one operation to another, the basic requirements during the periods remain the same.

The conditioning period should last around 60 days. This timeframe allows bulls to acclimate to the new environment and diet, attain adequate body condition, and produce/store good quality semen. At the start of the conditioning period, the bull battery should be fairly well established (including acquisition of new bulls; see 421).

A producer should have determined bull needs for the upcoming breeding season and appraised the existing bull battery. Evaluation should include a breeding soundness exam by an accredited veterinarian (see 425), which assures the reproductive capacity and physical soundness of each bull. Additionally, an evaluation of a bull's libido (serving capacity) is also required for adequate breeding performance. The use of physically sound, high-libido fertile sires will result in a shorter breeding and calving season.

Bulls found to be unsatisfactory with the breeding soundness exam, and possibly those that are questionable, should be replaced. New bulls should be acquired at least 60 and preferably 90 days before the breeding season. This provides ample time for the new acquisitions to adjust to the feed and acclimate to the new environment (see 421).

During the conditioning period, bulls that will work together should be grouped so they can become familiar with each other and develop a social structure, particularly because social dominance highly influences

the reproductive performance of a bull. Older, larger bulls are usually dominant in a group. However, the dominant bull may not have the highest libido or the best breeding soundness score (see 425). The dominant bull will typically breed the most cows, or inhibit other bulls from breeding them. Therefore, if the dominant bull is infertile, the fertility of the herd will decrease regardless of the reproductive merit of the other bulls.

Newly acquired bulls as well as the carry-overs in the bull battery should be brought up to date in a complete health program with the balance of the herd. Insect control is especially critical for bulls. Lice and flies both find bulls a likely target for infestation.

Proper attention and care of the feet can prolong the productive life of a bull and can help ensure physical soundness during the breeding season. After an extended period of inactivity, a bull's feet may be long and misshapen. Hoof trimming should be done at the start of the conditioning period, so there is time for adequate regrowth, which acts as a cushion during the breeding process. Nevertheless, bulls with chronic feet problems should be discarded from the herd to prevent propagation of such trait to the offspring.

### Bull Development

Perhaps the most critical factor for proper bull development is exercise. A bull during the breeding season might be equated to an athlete, since in most situations he travels several miles each day and maintains a high degree of physical activity. Physical fitness requires several weeks of conditioning. Bulls are by nature active and become more so as the weather warms before the breeding season.

If bulls are given ample area in pastures or lots, they will usually exercise themselves. In designing bull facilities, locate supplemental feeding and water areas as far apart as possible to stimulate exercise. For instance,

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if a hillside or slope is available, locate the feed at the top of the hill and water at the bottom of the hill.

Bulls that are physically fit when turned out will breed more cows during the breeding season because they will retain a high degree of libido and remain sound longer. Exercise before the breeding season also reduces injuries from fighting and riding.

## Nutrition

Before turnout, bulls should be at a relatively high nutritional level. This is necessary particularly to maximize growth and development of young bulls. Young and mature bulls will usually lose weight early in the breeding season, so they need to have an energy reserve when they are turned out.

Bulls should enter the breeding season with a body condition score of 6.0 (see 720), which provides the bull adequate body reserves to draw upon during the breeding season. See fact sheet 300 for additional information regarding nutritional requirements of bulls.

**Yearling Bulls**—Most yearlings will need to weigh 1,000 to 1,100 pounds before the breeding season. If they gain 2.0 pounds per day during the conditioning period, they should be making adequate growth and maintaining a satisfactory condition without becoming excessively fat. This rate of gain will require 24 pounds of dry matter or about 27 pounds of dry feed per day.

Adequate energy, around 63 percent of TDN in the diet (dry matter basis), should be provided. One example is a ration containing 80 percent high quality roughage (grass, hay, or silage) on an air-dry equivalent and 20 percent concentrate (oats, corn, etc.). Depending on the condition of the bulls, this means 5 to 9 pounds of grain per head per day and free choice roughage. At this age, the bulls should be growing rapidly, so they need to have 9 percent total protein in their diet (dry matter basis). A protein supplement may be needed, depending on the kind and quality of the roughage and the grain being fed.

**2-Year-Old Bulls**—These cattle should have already gained most of their mature size by breeding season, so their ration is not quite so critical. A 1,400-pound 2-year-old will probably need to gain only 1 pound per day during the conditioning period. To do this, active bulls may need 30 pounds of feed or more, including 4 to 6 pounds of concentrate.

**Fitted Bulls**—Over-conditioning (body condition score >7) is a problem sometimes encountered with 2-year-old bulls, especially newly acquired bulls that have been fitted for a show or sale. Therefore, as previously mentioned, it is important to acquire bulls at least 60 days before the breeding season to ensure proper conditioning (see 421). Over-conditioning can be detrimental to semen quality and service capacity of bulls during the breeding season.

To let these bulls down, start them on a ration similar to the one they have been eating, but feed only 60 to 70 percent of their previous intake. The amount of grain can be reduced at the rate of about 10 percent per week until the desired level is achieved. At the same time, substitute light, bulky feeds—such as oats or beet pulp—in place of corn or barley.

Ideally, this letdown should be completed before the bulls are turned out. Dramatic nutritional changes can have an adverse effect on semen production, so it is important that these ration modifications are done gradually during the conditioning period.

**Older Bulls**—For older bulls, the target energy intake during the conditioning period depends on their physical condition at the start. If bulls have been wintered in good condition, 5 to 7 pounds of grain may be adequate to build the desired energy reserve. If the bulls are thin, then they may need to receive 20 pounds or more of grain per head per day.

Several general precautions can help ensure success of concentrate feeding:

1. Provide adequate feeder space for all the bulls to eat concurrently. Large bulls need about 2 feet per bull. High-energy range cubes can be fed on the ground and can eliminate the need for bunks.
2. Make sure all the bulls have gathered at the feeding area before feeding any grain. This will help ensure that each bull gets his fair share and should avoid possible problems from overeating by a few animals. Up to 10 pounds per head can be fed in a single feeding. Greater quantities should be split into two or more equal feedings.

When 10 pounds or less of concentrate is needed per bull, a cereal grain (corn or barley) makes an adequate energy supplement. As the amount of concentrate fed per bull increases above this level, bulk up the feed with the addition of one part of oats, beet pulp, or wheat bran to two parts corn or barley. Avoid using wheat since it can cause stiffness and founder compared to traditional feeds such as corn.

Good bulls represent a substantial investment and are critical to the success of a breeding program. Proper care before the breeding season will help ensure fertile, active bulls during that time.

**Other Nutritional Considerations**—Adequate levels of vitamin A are necessary for optimum semen production. Green-growing forages are high in vitamin A value, and cattle can store this vitamin for as long as 7 months. Green color of hay is a good indicator of vitamin A value. Because of the importance and reasonable cost of vitamin A, it is recommended the inclusion of natural or synthetic sources of vitamin A to supplements or mineral mix to ensure adequate intake levels. This can also be accomplished by giving all bulls a vitamin A injection one or more times during the winter.

Bulls also should have free-choice access to a mineral supplement year round. A significant debate is ongoing between feeding organic or inorganic mineral supplements to bulls. The general answer is that both forms can be effectively used. Regardless of the choice, the use of a well-balanced mineral supplement to meet the bull's requirements is the main objective for producers.

Perhaps the greatest advantage of organic sources is when zinc, selenium, and copper are supplemented. These micro-minerals are important to bull fertility parameters, such as sperm production, semen quality, and overall reproductive health. Supplementing these organic mineral sources to bulls during the conditioning period when bulls are recycling their semen reserves is an alternative to year-round supplementation.

Gossypol, which is a substance derived naturally from the cotton plant, is another concern regarding bull nutrition. Whole cottonseed has a significant content of free gossypol, whereas in cottonseed meal or hulls, gossypol content is reduced and fairly unavailable to cattle. Therefore, producers that feed whole cottonseed to bulls need to use caution when designing their feeding programs.

Bulls consuming 30 mg of free gossypol per pound of bodyweight, which can correspond to as little as 6 pounds of whole cottonseed per head daily, may experience increased sperm abnormalities, decreased sperm production, and impaired sexual behavior. Further, gossypol appears to be more detrimental to reproductive function in young bulls near puberty compared to older, mature bulls.

Generally, whole cottonseed should be limited to 15 to 20 percent of the total diet for older cattle and to 10 percent for developing bulls, particularly during the conditioning period and breeding season. Producers can also analyze their feedstuff for free gossypol concentrations and plan the bull-feeding program accordingly.

### Testing for Libido and Serving Capacity

Libido is defined as sexual desire of the bull, whereas serving capacity is the ability of the bull to complete the act of breeding. Libido is a highly heritable trait ( $h^2 = 0.59$ ) that is not related to other breeding soundness evaluation parameters (i.e., semen quality and scrotal circumference), nor is it necessarily highest in the biggest, fastest growing, or most masculine bulls. Therefore, if a bull is rated satisfactory by the breeding soundness exam, he can still be unproductive if he lacks libido and serving capacity.

Studies have shown that cows exposed to high-serving capacity bulls became pregnant earlier and at a greater number during the breeding season compared to cows exposed to low-serving capacity bulls, which resulted in a \$53 gross income increase per cow

exposed (Hawkins et al. 1988). For that reason, before purchasing and turning out new bulls for breeding, producers should consult the sire source or the attending veterinarian about libido and serving capacity tests.

Methods to assess libido and serving capacity in beef bulls are being used with good results. These methods are preferable to the sporadic observation of bulls in the breeding pasture or observing bulls placed in a restricted area (small pens) with one or more females that are in heat. A commonly used method of testing libido and serving capacity in beef bulls follows:

1. Two mildly sedated females (heifers or cows) are restrained in service crates that are about 5 to 7.5 meters (16 to 25 feet) apart in a small pen. Bull response does not differ whether the female cattle are in heat.
2. The bulls are sexually stimulated before the test by watching from an adjacent pen while other bulls mount the restrained females for at least 10 minutes.
3. Two or three bulls are admitted to the pen with the restrained females, and their sexual activity is recorded for 10 minutes.
4. The scoring systems as described below are applied.
5. The bulls are tested on at least two occasions, preferably on different days. The best result of the tests is used for each bull's evaluation. Always ensure that venereal diseases such as trichomoniasis or campylobacteriosis (vibriosis) are not spread by these procedures (see 659 and 683 for more details).

#### Scoring System

- 0 — The bull showed no sexual interest.
- 1 — Sexual interest shown only once (i.e., sniffing at the perineal region).
- 2 — Positive sexual interest in the females on more than one occasion.
- 3 — Active sexual interest throughout the test.
- 4 — One mount or mounting attempt with no service.
- 5 — Two mounts or mounting attempts with no service.
- 6 — More than two mounts or mounting attempts with no service.
- 7 — One service followed by no further sexual interest.
- 8 — One service followed by sexual interest, including mounts or mounting attempts.
- 9 — Two services followed by no further sexual interest.
- 10 — Two services followed by sexual interest, including mounts, mounting attempts, or further services.

Libido and serving capacity testing, like most tests of biological systems, requires the use of considerable judgment. Generally, high-serving capacity bulls are those that score above 6. Bulls that score 10 quickly

can be removed from the pen before the completion of the 10-minute test.

If some bulls seem intimidated by other bulls and/or observers, the bull can be left in with females for 20 minutes. Try to test bulls of similar ages in the same groups. But remember, libido and serving capacity testing should be combined with the other aspects of breeding soundness evaluation.

## Conclusions

The conditioning or pre-breeding period should last around 60 days to allow bulls to acclimate to the new diet, attain adequate body condition (6 in a 1-9 scale), socialize with other bulls, and produce/store good quality semen. Practices that stimulate exercise during the conditioning period will also benefit bull performance during the breeding season. Bulls should be annually evaluated and approved by a breeding soundness exam and libido/serving capacity testing before turn out so the reproductive performance of the herd is maximized.

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