Cold Weather Can Affect Bull Fertility

by Heather Smith Thomas

Severely cold weather can result in bull infertility. Testicle damage and semen deterioration are common following a cold winter or winter with lots of wind.

Measures should be taken to protect bulls from winter winds and extremely cold temperatures. Fertility soundness examinations should be given to all bulls before the next breeding season if there is a chance that reproductive systems could have been damaged by frostbite. Any new bull going into a herd should definitely be checked.

The first study on cold weather problems in bulls was done in 1949. After a severe blizzard in Wyoming, scrotal frostbite was observed in a number of bulls. Semen samples from 88 bulls were collected by two veterinarians. The testicles and epididymis from three bulls with scrotal frostbite were taken post-mortem and submitted to the Armed Forces Institute of Pathology for evaluation. Two of the three bulls examined post-mortem had severe atrophy of the tubules that convey semen and a great deal of swelling and damage from the frostbite. Of the 88 bulls tested for semen quality, 83 had some degree of damage, with the lowered semen quality being directly affected by the severity of scrotal lesions. Bulls with the worst scrotal damage had the lowest semen quality.

A much more extensive study was done in 1965 following blizzard conditions during December, 1964. Twelve veterinarians reporting from eight states and the Province of Alberta observed serious scrotal frostbite in a number of herds when examining bulls in the spring prior to the breeding season.

The physical examinations and semen quality evaluations were performed according to techniques recommended by the American Veterinary Society for the Study of Breeding Soundness for this special survey. Semen samples were categorized and scored to place them satisfactory, questionable and unsatisfactory.

In this study, as in the 1949 study, necrotic (dead) areas less than 3 centimeters in diameter on the scrotum were classed as mild lesions. Severe lesions were those involving more than three-fourths of the entire scrotum. Moderate lesions were somewhere in between.

The result of the survey were put together at the College of Veterinary Medicine at Colorado State University, Fort Collins. Of the 6,389 bulls examined, 921 (14.4 percent) had scrotal frostbite. Semen quality of affected bulls was significantly inferior to that of unaffected bulls in the same herds. The defects in sperm increased in direct proportion to the severity of the frostbite lesions, testicular adhesions and swelling of the testes. Older bulls with lower hanging scrotums were more frequently and severely affected, since they apparently couldn't pull their testicles up close enough to the body to keep them warm. Yearlings and some two-year olds were less damaged.

Mating behavior was affected in a number of the damaged bulls; some of them refused to service cows for six months following the blizzard. Several of the damaged bulls were checked again later. Those with the most damage remained permanently infertile, while others with less extensive frostbite damage eventually recovered. Satisfactory spermatogenic function was regained in some bulls after several months.

Bulls with questionable semen quality after the initial evaluation had a better chance of recovery than those with unsatisfactory semen.

Several veterinarians reported that testicular swelling was always associated with unsatisfactory semen quality Thus the extent and reversibility of damage is related to the extent of vascular damage within the testes. It also was discovered that bulls exposed to extreme cold often suffer some sperm damage even without scrotal frostbite. The incidence of unsatisfactory semen quality among bulls exposed to cold weather (without evidence of frostbite) was higher than expected.

The weather conditions that caused scrotal frostbite in the 1964 blizzard were rain turning to ice and snow, accompanied by several days of temperatures lower than 25 below zero Centigrade (about 10 below zero F.) and winds gusting up to 60 miles per hour. The wind chill factor was equivalent to about 70 below zero F.

Other tests on bulls were conducted in various places in the spring of 1979 following the severe winter of 1978-79. Bulls in several geographic areas were adversely affected, including many of the bulls at the Iowa Winter Beef Expo sale.

Problems appeared again in 1984 following severe cold spells in January and February and again in the spring of 1989. A number of cattle died near Dubois, Idaho when they were buried by 15 feet of blowing snow. Many herds in other parts of the state suffered varying degrees of loss from wind chill factors that reached the equivalent of minus 100 degrees F.

Dr. Duane Mickelson an expert on bovine reproduction at Washington State University, says that there were a number of bulls in herds that suffered permanent infertility, following the 1989 blizzard conditions. A high percent did recover in time for the breeding season.

Bulls can recover from scrotal frostbite if there are not adhesions in the scrotal tissue and if the sperm tract is not damaged. The lower part of the scrotum usually suffers first. This is the area that remains unprotected when a bull draws his testicles up against his body for warmth. The epididymis is located at the bottom of the scrotum. If there is damage in the epididymal tract, semen will not be viable.

If a testicle is pliable and appears normal, there is a good chance the bull is not damaged. But if there has been serious freezing of the tissue, the scrotum will show signs of scarring. There will be a scabby area on the bottom third, up the back, where the scrotum has been exposed to the wind.

This kind of damage will prevent the bull from being able to raise and lower his testicles. If he can't move his testicles up and down to compensate for temperature changes, he will be infertile, since sperm production and viability depend upon proper temperature.

Windbreaks and good bedding during bad weather can help prevent testicle freezing. Bulls being trucked in cold weather should also be protected traveling in an open truck creates a serious wind chill factor.

The best way to prevent cold weather damage is to make sure that bulls can get out of the wind. If there is any question about the fertility of a bull, or the possibility of frostbite damage, have him checked by your veterinarian.

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