

Male Fertility



PHOTO BY KASEY BROWN

Heat stress and disease can impact bull fertility.

by **Kasey Brown**, associate editor; **Troy Smith**, field editors

Short-term heat stress can cause long-term consequences in bull fertility, so management of heat stress is crucial during the breeding season. Robert Wettemann said moving the calving season to later spring due to available grass moves breeding season to July and August, and that can be problematic.

Bulls are often forgotten, the Regents professor in the Department of Animal Science at Oklahoma State University (OSU) told attendees of the 2014 Applied Reproductive Strategies in Beef Cattle (ARSBC) symposium in Stillwater, Okla., Oct. 8-9. They are more susceptible to heat stress and definitely influence many potential pregnancies. Management of body temperature of bulls before and during collection of semen for artificial insemination (AI) is a major concern.

Why is heat stress such a cause for concern? Testicular temperatures must be cooler than

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a bull's body temperature. A short-term increase in body temperature, even for as short as one day, can influence the quality of semen and a bull's fertility. Exposure to high ambient temperatures, absence of shade, or even infection or disease can affect sperm motility and semen quality.

Wettemann shared data that reported testosterone function is not affected, so the quantity of semen is about the same. However, the number of sperm cells and motility dropped dramatically when subjected to heat stress. A significant point is that it took six to eight weeks to return to normal semen quality.

Spermatogenesis is a continuous process and takes 60 days, Wettemann said.

Management to reduce heat stress



PHOTOS BY TROY SMITH

► A short-term increase in body temperature, even for as short as one day, can influence the quality of semen and a bull's fertility, said Robert Wettemann, OSU animal scientist.

will help maintain a bull's fertility. Bulls need to be able to cool themselves when ambient temperature is higher than body temperature. He recommended providing bulls with shade. Studies have shown bulls with shade have a tendency to have greater motility and more live sperm. Sprinkling cattle and the ground with water also helps

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alleviate heat, and give cattle plenty of access to water.

He suggested using the Mesonet Cattle Comfort Advisor to monitor the heat index to proactively manage for heat stress.

“Breeding soundness exams (sometimes referred to as BSEs) are essential to eliminate bulls with potential fertility problems. However, a day or two of elevated body temperature can decrease fertility,” he concluded.

— by Kasey Brown

Trichomoniasis

When trichomoniasis gets in the breeding herd, a cow-calf producer could be headed for a wreck, warned Oklahoma State Veterinarian Rod Hall. Hall said small herds that aren't managed really well often suffer most, because producers may not recognize the problem. In such cases, trichomoniasis represents a risk of significant and prolonged economic loss.



► Typically, said Rod Hall, 85% of exposed cows and heifers become infected with the “trich” organism.

Hall explained that trichomoniasis is a sexually transmitted disease caused by a protozoan organism that lives in tiny skin crevices of an infected bull's penis and sheath. Infected bulls remain infected for life, but show no signs of disease.

Typically, added Hall, 85% of exposed cows and heifers become infected with the “trich” organism. Infected females are capable of becoming pregnant, but usually abort the fetus after one to four months. They remain infected for two to four heat cycles. After a brief subsequent period of immunity, females become susceptible to reinfection. Hall said there is no means of treatment and no vaccine that successfully immunizes cattle against the disease.

“In herds managed for a short breeding season, trichomoniasis can result in as much as a 50% decrease in the calf crop,” stated Hall. “In herds where the breeding season is long, there is potential for an extended calving period, resulting in lower average weaning weights.”

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PHOTO BY SHAUNA ROSE HERMEL

Is scrotal circumference a good indicator of heifer fertility

“If we want to improve economic efficiency in our herds, what's the best thing that we can do? Have more calves,” said Matt Spangler, University of Nebraska beef genetics extension specialist at the Applied Reproductive Strategies in Beef Cattle (ARSBC) symposium hosted in Stillwater, Okla., last fall.

Having more calves on the ground starts with improving the fertility level of the parents. Before improvement can be made, measurement must happen, but measuring female fertility is a difficult process, and data from most females are recorded later in life, said Spangler. Thus, current fertility selection measurements have gone to the bulls.

Spangler explained that scrotal circumference is recognized as an indicator trait for potentially improving fertility in female offspring. It is a trait that is cheap and easy to collect and can be taken on yearling bulls. He referenced data suggesting that it is 45% heritable.

“The fact is, if we select on scrotal circumference, we can certainly change it,” he stated.

Scrotal circumference also plays a role in age at puberty for female offspring, although the genetic correlation is relatively weak.

“A larger scrotal circumference has a tendency to decrease age at puberty,” he said.

However, its correlation to heifer pregnancy in *Bos taurus* cattle is null and in *Bos indicus* cattle is slight, perhaps even negligible, explained Spangler. Although the literature disproved scrotal circumference as a pathway for improving female fertility, according to Spangler, it is still the best indicator of male fertility.

“While it may not be directly related to female fertility, certainly there have been examples in the literature where increasing scrotal circumference does have a desired affect on several sperm traits. Even though the relationship between scrotal circumference and female reproductive traits is near zero, it doesn't necessarily mean that we should discard scrotal circumference EPDs (expected progeny differences),” he emphasized.

Spangler outlined alternate approaches to selecting for fertility. For commercial producers, he encouraged crossbreeding as a method to improve fertility. He also named several breed associations that use a stayability EPD, which is essentially a measure of reproductive longevity.

Spangler explained that the American Angus Association and the Red Angus Association of America have a heifer pregnancy EPD.

“If you want to select for improved female fertility in bull selection, use the EPDs that directly get at that. You'll be much more successful that way than selecting on an indicator trait like scrotal circumference, which the data suggest is perhaps not directly related,” said Spangler.

On a last note Spangler argued culling open cows is not a way to select for fertility.

He stated, “Selection for fertility says that you have put direct selection pressure to improve it through things like EPDs, selecting for the better ones instead of just removing the bad ones.”

— by Paige Nelson

Editor's Note: Spangler spoke during Thursday's ARSBC session focused on fertility in the male. Visit the Newsroom at www.appliedreprostrategies.com to view his PowerPoints, read his proceedings or listen to his presentations. Compiled by the Angus Journal editorial team, the site is made possible through sponsorship by the Beef Reproduction Task Force and provides comprehensive coverage of the symposium.

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According to Hall, control of trich focuses on the bull, through testing to identify infected animals. Smegma consisting of exudate and sloughed skin cells is collected from the surfaces of the penis and sheath. For a culture test, smegma samples are introduced to a culture medium, sent to a laboratory and examined for the presence of infective protozoa. An alternative PCR test involves testing the sample for the presence of DNA from the infective organism.

Hall said regulations to help control

the spread of trich vary among states. In Oklahoma, all bulls entering must post negative results from one PCR test or three culture tests. Bulls changing ownership within the state also must be tested unless they are going to slaughter. Virgin bulls under two years of age are exempt from testing requirements.

“To protect their herds from trichomoniasis, producers should practice good biosecurity measures. Use good management and keep good records,” advised Hall. “Buy only virgin bulls. When buying

replacement females, buy virgin heifers rather than cows.”

— by Troy Smith

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