

Ensuring Bull Fertility



PHOTO BY SHAUNA ROSE HERMEL

Sire fertility is crucial to breeding program success.

by **Shelby Mettlen**, assistant editor, & **Troy Smith**, field editor

Much of a cow herd's genetic potential lies with its herd sires, making bull fertility a vital component of an operation's breeding program. John Kastelic, professor of animal reproduction and head of the Department of Production Animal Health at the University of Calgary Faculty of Veterinary Medicine, explained the importance of producing and selecting healthy bulls at the Applied Reproductive Strategies in Beef Cattle (ARSBC) symposium Aug. 30.

Nutrition until 25-30 weeks of age can ultimately determine the reproductive health of a bull, Kastelic said. If bulls are fed at a moderate level up to 30 weeks of age, it not only optimizes the growth of the bull, but also his reproductive potential, he said.



"On the other hand," he continued, "if we underfeed bulls prior to 25-30 weeks, we cause a permanent decrease in the size of the testes and, to some extent, delayed puberty."

Overfeeding bulls after 25-30 weeks of age can cause reductions in semen quality and fertility, as well as other health issues.

To be reproductively sound, a bull must be able to identify cows that are in estrus, he must be able to mount and breed those cows, and he must be able to deliver large numbers of normal sperm. A decrease in one or more of those qualities will result in limited fertility.

When examining bulls, Kastelic looks at the health and well-being of the bull,

CONTINUED ON PAGE 180



PHOTOS BY TROY SMITH

► "It's crucial that a bull is normal and healthy, has no structural defects and that he meets the minimum requirements in motility, morphology and scrotal circumference to be deemed acceptable," said John Kastelic of the University of Calgary Faculty of Veterinary Medicine.

Ensuring Bull Fertility CONTINUED FROM PAGE 176

his structural soundness, and evidence of infectious disease or any other abnormalities that would affect his ability to successfully breed cows.

Kastelic emphasized the importance of correctly measuring scrotal circumference and collecting and evaluating semen. Minimum requirements include a maximum of 30% abnormal sperm cells, a maximum of 20% sperm with head defects and a minimum of 30% sperm motility.

There are also minimum standards for scrotal circumference, but they vary from one breed to another, he said.

“It’s crucial that a bull is normal and healthy, has no structural defects and that he meets the minimum requirements in motility, morphology and scrotal circumference to be deemed acceptable,” Kastelic said.

If a bull is deemed unacceptable, he is sorted into one of two categories. Bulls deemed permanently unacceptable possess a defect that is very unlikely to improve, he said. If a bull is currently unacceptable, but believed able to improve, he is sorted into the second category where a reevaluation is recommended in three to six weeks or longer.

“We really encourage people

to do bull breeding soundness exams, and really the intent there is to identify the bulls that will have low fertility,” Kastelic said. “It’s difficult or impossible to identify one bull as being a better bull or having higher fertility. Really, our goal is to eliminate the bulls at the lower end that would not be expected to have reasonable fertility.”

Failure to conduct a bull breeding soundness exam can result in significant and expensive losses at the production level, he said.



— by Shelby Mettlen

Nutritionist offers bull development tips

There is an old saying that pertains to ranchers and stock farmers who buy breeding bulls: None want to buy a fat bull, but none will bid on a thin one. Accordingly, many seedstock sellers wrestle with the dilemma of how to get bulls fat enough to sell without ruining their serviceability, because too-fat bulls run the risk of becoming unsound on



► Few bull development programs are based on knowledge backed by research, because little applied research data exists, says Dan Larson, Great Plains Livestock Consulting Inc. Instead, bull development programs are based largely on personal experience, anecdotal evidence and a little “magic.”

their feet, failing a semen test or melting down during breeding season.

Dan Larson, a nutritionist with Great Plains Livestock Consulting Inc., said feeding bulls to 0.20 to 0.25 inches of fat cover is adequate for energy reserves, growth and semen production.

“That’s plenty for any bull,” stated Larson. “Unfortunately, the norm is greater.”

According to Larson, few bull development programs are based on knowledge backed by research, because little applied research data exist. So, bull development programs are based largely on personal experience, anecdotal evidence and a little “magic.” Larson said more secret formulas are applied to bull development than to any other industry segment, except show cattle.

“We need to apply some aspects of feedlot management to bull development,” opined Larson. “We need to use what’s been learned about maintaining rumen health and soundness of feet.”

Larson listed bull tests among the development programs that ruin too many bulls. He called bull tests a potentially good way to compare genetics, but the bulls are often pushed for maximum gain rather than allowed to simply express genetic potential. Larson said another contributor to the problem of overfed bulls are “specialty feed

additives” that are more about marketing than science-based nutrition.

Also criticized for fostering rumen and feet problems were development programs utilizing self-feeders. Larson said self-feeders have “destroyed more bulls than a castration knife,” because there is no way to adequately control animal intake. He considers intake-limiting technologies ineffective.

Offering recommendations for each stage of bull development, Larson said preweaning supplementation (creep-feeding) definitely has an impact. He fears the practice is oversold, though it often is rewarded on the auction block. In his opinion, however, long-term creep-feeding can undermine bull longevity.

Larson allowed that creep-feeding for a short time, two to four weeks prior to weaning, can help adapt bull calves to a postweaning ration. During the postweaning development period, nutrition should be managed much like it is done for cattle coming into a feedlot, with multi-step adaptation to rations containing higher amounts of concentrates. Roughage in the ration is essential to control dietary energy and manage intake. Postweaning growth targets should be within the range of 2.5 to 3.25 pounds of gain per day, on average, he said.

Because overfed bulls will lose weight when turned out on pasture for the breeding season, Larson recommended that bulls be “hardened” well in advance. He advised transitioning bulls to a pasture environment at least 80 days before turnout.

— by Troy Smith

Herd health affects reproduction

For conscientious cow-calf producers, an important part of any herd health program is managing risk associated with reproductive diseases — those that threaten establishment and maintenance of pregnancy and may hinder fertility. Kansas State University veterinarian Gregg Hanzlicek discussed some of the more prominent diseases responsible for abortion and low fertility.

Hanzlicek said many producers are familiar with campylobacter (vibriosis) and leptospirosis, which are contagious bacterial diseases commonly known to be responsible for abortions in cattle. While they may be aware of anaplasmosis, producers may not know that this bacterial infection can affect reproduction.

“Anaplasma infection typically is not a fertility issue,” said Hanzlicek, allowing that it is possible, however, for the infection to result in late-term abortions or stillborn calves.

“Cows can become so anemic that not enough oxygen reaches the fetus, which dies,” Hanzlicek explained. “Or, the organism may be transmitted to the fetus, which typically results in abortion.”

Referring to the recent availability of what he called “an experimental vaccine,” Hanzlicek said reports suggest the product helps reduce the clinical signs of anaplasmosis, but it is not effective as a preventative to infection.

“Guys that use it like it,” stated Hanzlicek.

Kansas State University Diagnostic Laboratory data show a steady increase, since 2014, in abortion cases associated with infectious bovine rhinotracheitis (IBR). Many fetuses submitted to the laboratory contained an IBR strain identical to that in modified-live virus (MLV) vaccine.

“I’m not saying ‘Don’t use MLV vaccine,’ but make sure you follow label directions and your veterinarian’s advice,” recommended Hanzlicek.

Like IBR, bovine viral diarrhea (BVD) is a viral disease that can impact reproduction. It’s not just a feedlot disease as many people once believed. Hanzlicek said exposure of bred females to animals persistently infected (PI) or transiently infected (TI) with BVD can lead to early embryonic death, abortion and subsequently reduced fertility.

Hanzlicek also discussed neosporosis, the causative agent of which is a protozoan parasite carried by canines. Dogs, coyotes or wolves become infected by eating neospore-contaminated bovine muscle, placenta or aborted fetus tissues and spread it through the environment via their feces. Pregnant cows or heifers that become infected may suffer early embryonic death or abortion, or they may deliver a live “dummy” calf that appears normal but is a carrier of neospore organisms.

Hanzlicek said other “emerging” diseases with implications for reproduction include bovine leukosis virus and Johne’s disease. He said some evidence suggests zoonotic potential for both, meaning some researchers think each disease may be transmissible to other species, including humans.

— by Troy Smith

To listen to this presentation, to view the PowerPoints or to read the proceedings, visit the Newsroom at www.appliedreprostrategies.com. Compiled by the *Angus Journal* editorial team, the site is made possible through sponsorship by the Beef Reproduction Task Force.

The 2017 ARSBC Symposium was hosted by the Task Force and Kansas State University Research & Extension. Next year’s symposium will be Aug. 29-30 in Ruidoso, N.M.



Editor’s Note: Troy Smith is a cattleman and freelance writer from Sargent, Neb.

Commercial aspects of sexed semen

George Seidel contends that sex is the most important genetic trait. The Colorado State University researcher and professor emeritus is talking about gender. For 10 years, sexed semen has been commercially available, making it possible for managers of artificial insemination (AI) programs to choose the gender of a cow’s next calf.

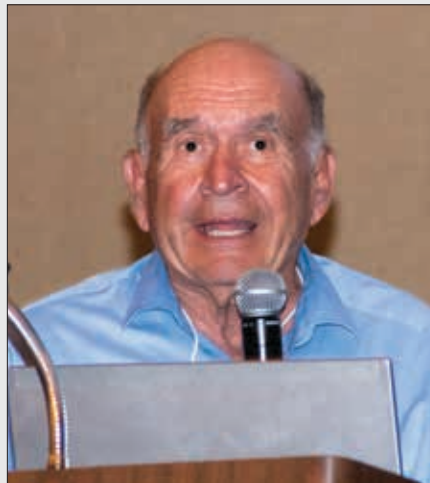
Seidel reviewed the development and commercialization of sexed-semen technology. He told the audience that with additional improvement to that technology, to increase fertility, sexed semen could make conventional unsorted semen obsolete.

Currently, the purity of gender-sorted semen is near 95%. Because the one-at-a-time sorting of sperm cells is a slow process, the cost of sexed semen remains relatively high. Adding to the cost is the fact that sorting damages more cells than does conventional collection and freezing of semen. A typical dose of conventional semen used for AI contains roughly 20 million sperm, while a single dose of sexed semen contains about 2 million sperm — a compromise between cost and fertility.

“The cost of sexed semen is about \$15 per dose higher,” explained Seidel, “but the biggest cost is lower fertility.”

Some people have promoted the idea of doubling the number of sexed sperm per dose to 4 million. Seidel says doubling the sperm dose does not increase fertility significantly, but it does increase the cost.

Pregnancy rates following insemination with sexed semen typically are lower than with conventional semen. However, Seidel says following procedures to the letter and using excellent technique has resulted in pregnancy rates near those achieved



► If you do everything right, pregnancy rates are pretty good — about the same as with conventional semen,” says George Seidel of using gender-sorted semen, “but you have to do everything right.”

with AI using conventional semen.

“If you do everything right, pregnancy rates are pretty good — about the same as with conventional semen,” says Seidel, “but you have to do everything right.”

Seidel believes fertility of sexed semen will continue to improve. In fact, he believes advancements in the technology will result in higher fertility with sexed semen than with unsexed semen. That has already happened with sheep.

The sexing process already sorts out dead and nonviable sperm cells. With a little more technological tweaking, fertility is likely to be further improved. Seidel notes that, at any given time, one or the other gender is always more valuable, so he is confident of demand for the

product. Sexed semen might, he suggests, crowd conventional semen out of the marketplace. For that to happen, though, sexing costs will have to be lower.

To listen to this presentation or to view his PowerPoint, visit the Newsroom at www.appliedreprostrategies.com. Compiled by the *Angus Journal* editorial team, the site is made possible through sponsorship by the Beef Reproduction Task Force.

— by Troy Smith, field editor