

ARSBC 2012: Management of Stress

Control Those Tempers

Cattle temperament, animal handling affect fertility.

by Troy Smith, field editor

Temperamental tendencies are more apt to surface among females. It's true for bovine animals at least, according to Oregon State University beef cattle specialist Reinaldo Cooke. In a presentation during the 2012 Applied Reproductive Strategies in Beef Cattle (ARSBC) symposium in Sioux Falls, S.D., Cooke said females and young cattle tend to be temperamental. Animals accustomed to wide-open spaces become more temperamental when confined, and *Bos indicus* breeds generally are more temperamental than *Bos taurus* breeds of cattle.

"It means they are more nervous or excitable, and they may be more aggressive," said Cooke. "The expression of temperament is a stress response, indicating the animal is outside its comfort zone. It's usually tied to fear, which causes a hormonal response. Blood concentrations of cortisol and other hormones increase, preparing the animal for fight or flight."

Some level of temperament can be desirable if, for example, it makes a range cow better able to protect her calf against predators. However, many beef producers often select for very calm, docile cattle. It generally promotes greater safety for the animals and their human handlers. Cooke said cattle temperament has implications for economic return in a beef cattle operation. Stress can impede normal metabolic processes, thus reducing production efficiency of growing cattle. Even carcass merit can be negatively affected.

"Stress can impact reproduction, as well as feeding performance and carcass traits," said Cooke. "Physiological effects include changes in hormones involved in the estrous cycle and maintenance of pregnancy. Excitable temperament can be associated with delayed onset of puberty and lower pregnancy rates."

Cooke said it can pay to take steps to improve temperament within a beef herd, and described evaluation methods.

"Temperament can be assessed by evaluating the behavior of animals held in a chute, and scoring their behavior on a one-to-five scale," explained Cooke. "Exit

velocity scoring is another way, where the score is based on the speed at which an animal leaves the chute. Both methods are usually fairly well-correlated. They can

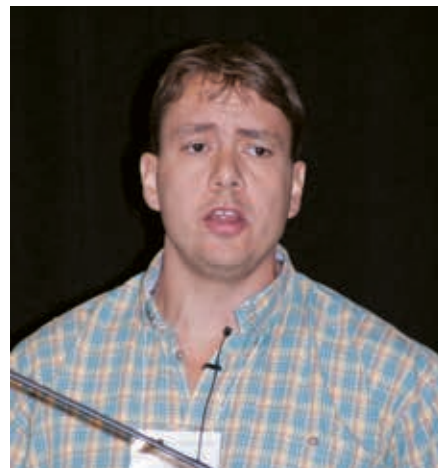
be used individually, or by combining the scores and using the average as a temperament score."

Cooke advised application of low-stress animal handling techniques and noted how temperament of young animals can be improved by acclimating them to


processing facilities and handling by humans. Cooke recommended producers take time to acclimate replacement heifers, in particular, while they are very young. He admitted that acclimation is often less effective with mature animals. For the worst bad actors, the best option may be culling.

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Cooke spoke during Tuesday's ARSBC session focused on management of stress. Visit www.appliedreprostrategies.com/2012/SiouxFalls/newsroom.html to listen to his presentation and view the accompanying PowerPoint and proceedings paper. 

A Steady Diet

Managing heifers to avoid stress-induced fertility issues can set them up for a longer stay in the herd.

by Troy Smith, field editor



► George Perry noted that consistently better pregnancy rates are achieved when heifers are developed on grass from weaning to breeding.

How important is beef cow longevity? "Research has indicated it takes the net revenue from approximately six calves to cover the development and production costs of each replacement heifer," said George Perry, South Dakota State University (SDSU) reproductive physiologist. "In addition, any cow that misses a single calving is not likely to recover the lost revenue of that missed calf. That makes longevity of a beef female pretty important to the sustainability and profitability of any beef operation."

Perry urged his audience to consider that, according to National Animal Health Monitoring System (NAHMS) data, problems related to reproduction are the leading reasons for culling cows. Failure to breed and other fertility problems account for 37% of females eliminated from breeding herds. Furthermore, greater than 15% of animals

Nutritional Excess, Deficiency Can Harm

Body condition affects oocyte quality and embryo survival.

by **Troy Smith**, field editor



▶ “Nutritional stress can have dramatic effects on a developing follicle and oocyte,” emphasized Allen Bridges, recommending that females be managed for appropriate body condition.

For successful reproduction in the female bovine, several benchmarks must be reached. She must exhibit a normal estrous cycle. She must have functional ovaries. She must be capable of producing a viable oocyte or “egg,” and she must be capable of providing a uterine environment suitable for embryo development and maintenance of pregnancy. According to Allen Bridges, University of Minnesota reproductive physiologist, for all of that to work, the female bovine must have adequate nutrition.

“It’s pretty basic. We’ve known it for a long time. When they receive inadequate energy or protein, cows don’t get pregnant,” said Bridges, during the Applied Reproductive Strategies in

Beef Cattle (ARSBC) conference Dec. 3-4, in Sioux Falls, S.D.

Bridges said researchers have investigated

how the estrous cycle is influenced by nutrition. His research is focused on discovering what direct effects nutrition has on oocyte maturation and competence, and how nutritional status during early gestation impacts uterine function and embryo survival. He offered examples of the ways certain nutritional hormones affect reproductive tissues and how changes in nutrition and body condition during the postpartum period affect reproductive processes and

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pregnancy success.

Insulin, explained Bridges, is a metabolic hormone produced by the pancreas to regulate fat metabolism. Insulin level also affects production of estradiol, which is essential to reproductive function. Inadequate nutrition means lower insulin production and lower fertility.

“Too much body condition means too much insulin and the same end result,” warned Bridges. “Whether females are thin and staying thin or fat and getting fatter, neither is good.”

Bridges said nutritional stress also causes reduced production of insulin-like growth factor-1 (IGF-1), which plays a role in cell growth. Additionally, nutrition can affect production of leptin, which appears to be associated with insulin and IGF-1 levels.

“Nutritional stress can have dramatic effects on a developing follicle and oocyte,” emphasized Bridges, recommending that females be managed for appropriate body condition — not less than body condition score (BCS) 4 and not more than 6.

“It is possible to get too much of a good thing,” he added. “Nutritional excess can have the same results as deficiency.”

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culled were less than 5 years of age, and nearly 32% were between the ages of 5 and 9 years.

“Females that are culled from a herd prior to producing six calves increase the developmental cost of other heifers and do not contribute to the profitability and sustainability of the operation,” added Perry. “Therefore, understanding how management decisions impact pregnancy success and longevity will have an effect on profitability and sustainability.”

According to Perry, a common approach to replacement heifer development may contribute to reproductive failure. This can occur when heifers are grown and prepared for breeding while confined to a feedlot. Heifers may then be turned out to pasture for natural service, or turned out after artificial insemination (AI). The change in environment, including an abrupt change in diet, may trigger a period of weight loss. For heifers exposed to natural service, the ability to conceive may be hindered. Embryo survival may be jeopardized among heifers very recently bred by AI.

Perry noted that consistently better pregnancy rates are achieved when heifers are developed on grass from weaning to breeding. This development method may not be possible for many producers, and Perry admitted there is no single “best” way to develop heifers.

“It is best to avoid big changes in diet at breeding or right after AI. It’s particularly important that heifers don’t go through a period of negative energy intake,” said Perry.

Managing heifers to conceive early in the breeding season is a first step toward improving longevity of the herd, but Perry emphasized that managing heifers to minimize embryonic losses is essential to maximizing productivity.

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