

Dealing with Heat Stress' Effect on Reproduction

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Understanding the impacts that heat stress can have on the reproduction of a cow, which were discussed in the previous issue, may provide you with reasons to try to implement good management decisions to help alleviate the stresses heat causes. Several steps can be taken to help cows deal with the environment they are in. Some include facilities and management, reproductive technologies, dry cow management, and nutritional modifications.

Environmental Modification

Modifying facilities for heat abatement is one way to help cows deal with heat stress. Many farmers use shade, sprinklers, and fans to help confined cows. For cows housed on pasture, shade structures or trees are beneficial. If cows congregate under the same trees or shades, these areas should be rotated to minimize spread of mastitis. The main goal is to optimize convection (fans), conduction (cool lying surfaces), and evaporation (sprinklers). A good benchmark for optimization is to keep rectal temperatures of cows below 102.2°F. By measuring rectal temperatures of cows, one can see if their heat abatement program is working. University of Florida researchers found that cooling cows during the daylight hours or 24 hours a day in summer sustained conception rates of 40%. Also, cows provided shade had lower respiration rates (54 vs. 82 breaths/min), reduced rectal temperatures (102.0 vs. 102.9 °F), and improved conception rate (44.4 vs. 25.3%) compared with cows with no shade.

The holding pen is an area frequently forgotten. This is an area where cows will spend two to four hours a day and can result in severe heat stress without heat abatement. Modifying this area with fans and sprinklers can keep cows cool and reduce stress in warm weather.

Reproductive Technologies

Development of many reproductive technologies has improved reproductive performance in cows. Many estrus detection aids are available to help when length of standing heat is decreased. These technologies include tail head patches, chalk, pedometers, and accelerometers. Timed AI is also useful when hot temperatures decrease expression of estrus.

Embryo transfer is an additional means to get around the effects of heat stress on reproduction. Once the embryo is 7 – 10 days old, it has a much greater chance of survival. Therefore, transferring undamaged embryos at that stage can increase pregnancy rates if this can be accomplished economically.

Dry Cow Management

Dry cow management is an aspect that is sometimes overlooked. However, this time in the cow's pregnancy is extremely important and helps determine how she will perform and reproduce in her next lactation. Therefore, preventing heat stress is important. Providing shades, fans, and sprinklers in the barn if confined or over the feed alley if on pasture are ways to manage heat stress. Shade structures throughout the pasture can also be a beneficial modification. It is important to rotate these structures to avoid muddy patches that can lead to mastitis.

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Nutritional Modification

Lastly, nutritional modifications can be considered. First, be sure cows have ample amounts of clean, fresh water. A cow drinks about one-half gallon of water for each pound of milk produced. For a cow producing 70 pounds of milk, she drinks about 35 gallons of water. This requirement increases with hot weather so be sure waterers are working efficiently and enough waterer space is provided. Also, feed in early morning and late evening to encourage intake. Feeding more frequently, especially during the cooler parts of the day, may also stimulate DMI during heat stressed periods.

Feeding excess protein takes extra energy to metabolize, in turn producing excess metabolic heat. Also, when dry matter intake is low, consider feeding additional fat to boost energy instead of feeding excess concentrate. It is important not to mess up the balance of concentrate and fiber as too much fiber can cause greater heat of digestion while too much concentrate can lead to acidosis. Recommendations for grain and fiber are to have non-structural carbohydrates making up 35 – 40% of the dry matter (DM) content and neutral detergent fiber making up 28 – 34% of the DM, and to maintain the proper particle size. Furthermore, addition of a yeast product can help digest fiber and increase efficiency of digestion, in turn, reducing acidosis incidence.

Cow sweat is largely composed of potassium as opposed to sodium in humans. Supplying a mineral supplement to keep the correct mineral balances to allow for optimal sweating is important. The requirements for lactating cow's DM include 1.6-1.8% Potassium, 0.4 – 0.5% Sodium, and 0.35% Magnesium.

Conclusion

Understanding ways to reduce heat stress is an important part of dealing with the repercussions it has on the cow's reproduction. We live in an environment that can be difficult to manage, but with the right tools, it is possible to reduce the impact of heat stress.

References

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