Texas Dairy Matters

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REPRODUCTION PROGRAM CHANGES TO IMPROVE SUMMER FERTILITY

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Heat stress (**HS**) negatively impacts all aspects of dairy cattle production. Milk production declines and reproduction losses during the summer substantially impact the economic potential of dairy farms. The annual economic impact of HS on American animal agriculture has been estimated at $2 billion, with the dairy industry alone accounting for $900 million of this loss.

Heat stress occurs over a wide combination of solar radiation levels, ambient temperatures, and relative humidity. This is further aggravated by metabolic heat production (generated by the cow herself). Generally, it is assumed that a cow becomes more sensitive to HS as milk production increases due to elevated metabolic heat production.

The dairy industry continues to focus on selecting for production traits which, in turn, may increase the dairy cow's susceptibility to HS further intensifying the summer decline in milk production and reproduction.
Consequently, strategies should be initiated to lessen the severity of HS on both reproduction and milk production to improve cow performance and farm profitability. Mentioned below are several changes that can be made to your reproduction program to improve summer fertility.

Heat detection is significantly reduced during HS. Improve estrous detection during summer by increasing the time and number of visual observations for estrus. Tail head paint is the most popular estrous detection aid and should be applied in adequate amounts with easily observable colors. This should be coupled with visual estrous detection. There are several technologies available to improve identification of estrus. The HeatWatch® (CowChips, LLC, Denver, CO) system records the number and times mounted during estrus through the use of a radiotelemetric pressure transducer placed on the tail head to transmit information to a computer. Pedometers can also be used to measure the increased amount of activity associated with estrus.

Heat stress significantly impairs bull fertility in the summer. Semen quality decreases when bulls are continually exposed to ambient temperatures of 86 ºF for 5 wk or 100 ºF for 2 wk despite no apparent effect on libido. Heat stress decreases sperm concentration, lowers sperm motility, and increases percentage of morphologically abnormal sperm in an ejaculate. After a period of HS, semen quality does not return to normal for approximately 2 months because of the length of the spermatic cycle, adding to the carry-over effect of HS on reproduction. It may prove beneficial to periodically check semen quality. In addition, many dairy producers use synchronization and A.I. for a set number of breedings (i.e. 3 A.I. breedings) and then move the cow to the bull pen; however it may be advantageous to continue to synchronize and A.I. for several more breedings to by-pass the deleterious effects described above during and immediately after periods of HS.

The use of fixed timed AI (**TAI**) to avoid the deleterious effects of reduced estrous detection has been well documented. Utilizing some type of TAI (i.e. Ovsynch, Cosynch72, or Ovsynch56), either coupled with or without estrous detection, can improve fertility during the summer. A study conducted in Florida during the summer months observed an increase in pregnancy rate at 120 d postpartum (27 % vs. 16.5 %, respectively), and a decrease in days open, interval from calving to first breeding, and services per conception in cows TAI versus inseminated at estrus.

Another possible way to improve fertility in the summer is through an injection of GnRH at estrus. One study injected GnRH into lactating dairy cows at detected estrus during late summer in Mississippi and increased conception rate from 18 % to 29 %. In agreement with this study, lactating dairy cows were injected with GnRH at the first signs of standing estrus during the summer and autumn months in Israel, and conception rates increased compared to untreated controls (41 % to 56 %, respectively).

In conclusion, HS can significantly decrease pregnancy rates with impacts lingering well into the fall months. Designing strategies to reduce negative effects of HS on fertility; such as enhanced cooling, ration adjustments, and reproductive protocol changes, will improve dairy farm profitability.