

# Heat Stress is a Hot Topic

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Heat stress negatively affects many cattle around the world. In the United States, heat stress is particularly bad in the southeast. Heat stress decreases dry matter intake, production, and reproductive performance. Below are reviews of new and interesting research conducted at various research institutes.

University of California, Davis researchers conducted a study where the objective was to determine the relationship between signs of panting and respiration rates, both of which may be indicators of cow's heat load. Respiration rates and panting signs (drooling, mouth open, or tongue out) were measured every five minutes for thirty-two cows. The researchers determined that all signs of panting were accompanied by a higher respiration rate. **Take home message:** When cows are panting and breathing heavily, they may be trying to dissipate their heat load. This study reaffirms that if a cow exhibits these signs, a producer will want to provide cows with more heat abatement resources (fans, shade, and sprinklers).

Cornell University researchers studied the relationship between milk yield with rectal temperature, respiration rate, udder skin temperature, and body surface temperature on eight cows. Four cows were housed in a cooled environment and four cows were housed in an environment with a temperature humidity index of 79.5. The researchers discovered that udder skin temperatures and respiration rates were equally related with rectal temperatures. They also discovered that rectal temperatures had the highest correlation with milk yield. Udder skin temperature was a better indicator of milk yield than respiration rates. Udder skin temperature may be a useful indicator of heat stress as udder skin temperature is fast to measure and non-invasive. **Take home message:** Udder skin temperatures are comparable to respiration rates as a heat stress indicator.

California Polytechnic State University researchers studied differences in the degree of heat stress based on cow cooling methods. Fifteen cows were housed in two different barns. One barn had fans and soakers and the other barn had soakers only. Rectal temperatures were measured three times per day to assess cow heat stress. No difference in the rectal temperatures of the cows housed in the two barns was shown. However, differences in rectal temperatures of the cows that were housed in the barn with soakers only (101.5° F) occurred when they were moved to the holding pen which had fans and soakers (100.8° F). This result highlights that having fans and soakers may be effective in decreasing heat stress. **Take home message:** This study reiterates that housing cows in barns with fans and soakers may help alleviate heat stress.

University of Florida scientists examined the cellular structure of calves' intestines after being *in utero* in heat stressed cows. Thirty bull calves were sacrificed either at birth, or 1 and 2 days after birth. Their intestines were removed and tissues sampled. The researchers discovered that calves *in utero* of cows exposed to heat stress had limited passive immunity capability. **Take home message:** Cooling dry cows may help calves born to these dams increase their IgG uptake and increase their passive immunity capability.

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## Heat Stress is a Hot Topic

Cornell University researchers conducted a study where they used temperature humidity index to evaluate its impact on pregnancies per AI and postpartum disease. The researchers determined that when cows were inseminated in times of heat stress compared to non-heat stress they had reduced pregnancies per AI from 38.7% to 32.5%, respectively. Cows that calved during a period of heat stress had an increased risk (30.2%) of having a postpartum disease than cows calving during a period of non-heat stress (26.3%). **Take home message:** Inseminating cows during heat stress may decrease the rate of pregnancies per AI. Calving during heat stress may increase the cow's risk for disease.

In conclusion, heat stress can negatively affect cows. Heat stress increases cow's panting and respiration rate, rectal temperature rate, postpartum disease rate, and decreases their pregnancies per AI rate. Heat stress on the dam can also negatively affect calves by decreasing their passive immunity capability. This new research was presented at the 2015 Joint Annual Meeting of American Society of Animal Science and American Dairy Science Association in Orlando, FL. What a great environment Orlando made to discuss heat stress!