

Summer Heat Stress

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Each year dairy producers in nearly all regions of the country experience the effects of summer heat stress on their animals. Some regions obviously have much longer stress periods than others, but all have some percentage of days throughout the year that cause depressing and costly effects on livestock. A few years ago researchers at The Ohio State University conducted an extensive study on the economic losses from heat stress to U.S. livestock, and published their findings in the Journal of Dairy Science Volume 86, E. Supplement (2003). The paper reveals some very interesting information that should be convincing evidence to all livestock producers of the importance of providing heat stress abatement practices for their animals. The findings regarding dairy cattle are summarized below.

First some information on what data were used in the study. The researchers used daily weather records from 257 weather stations throughout the U.S. starting between 1871 and 1932. Thus, data from a range of 68 to 129 years were used. Annual USDA animal inventory and production data estimates for the year 2000 were used. Heat stress was assumed to start when the temperature-humidity index exceeded 70 for cows, 72 for heifers over 1 year old, and 77 for those under one year old. Equations to estimate the cost of heat stress were developed based upon research studies of the biological responses of heat stress on animals. For dairy cows the effects on dry matter intake, milk production, change in days open, change in monthly reproductive cull rate, and change in monthly death loss from heat stress were used. Equations were also developed for replacement heifers that considered dry matter intake loss, weight gain loss, and change in monthly death rate due to heat stress.

When only natural ventilation provided the heat abatement for dairy cows, the estimated annual milk production loss from heat stress ranged from 150 lbs. in Wyoming to over 4,550 lbs. in Louisiana. As would be expected, the southeastern and southern tier of states had the greatest annual milk loss from heat stress. It is interesting to note the percentage of hours per year that dairy cows were estimated to be under heat stress in the various states. In Florida cows were under stress nearly 50% of the hours per year (48%). The other southern states also had percentages ranging from about 20 to 40%. The percentages in the top dairy states were 12% for CA, 8.8% for WI, 8.2% for NY, 6.6% for ID, 12% for PA, 9.3% for MN, 8.1% for MI, and 36.3% for TX. The increases in average days open, annual reproductive cull rate, and deaths to heat stress followed the same pattern as the milk production losses. The effects on replacement heifers were much less severe, and had minimal economic consequences.

The authors concluded that for dairy cows some form of heat abatement was economically justified across all states, with the optimum being at least the use of fans and sprinklers. In some of the southwest and plains states the use of high-pressure evaporative cooling could be economically justified.

If you as a dairy producer are not having your cows cooled during the heat stress periods of the year, you are incurring an unnecessary financial loss. Cooling fans and sprinklers over the feed alleys, in the parlor holding pen, and perhaps even over the free stalls can be beneficial. Cooling dry cows also has been shown to have an economic benefit. Be sure your cow cooling system is operating properly. There are many heat stressing days ahead yet this fall.