

Real-time animal response to climate changes

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The immense metabolic demand of high yielding cows requires to dispose) by panting, sweating and vasodilatation (large amount of metabolic heat. Inability to do so causes heat stress that results animal suffering and deteriorates production and reproduction. In many arid and semi-arid zones, fans and water sprinklers are used in barn, in cooling yards and/or in the feeding lane to help the cows to get rid of excessive heat. It is common to activate the cooling management by surrounding temperature-humidity index (THI) measurements and not by real time body temperature measurements of the cow that might be different (due to production level, body condition, gynecologic status, herd genetic variance) in response to heat stress etc. Real-time temperature can now be measured using reticulorumen bolus (SmaXtec). In the current study, we developed a model that calibrate the cow temperature from the reticulorumen to the vaginal temperature loggers - the vaginal temperature was our gold standard. A total of 30 lactating cows were randomly assigned to one of two treatment groups (evenly by lactation, energy corrected milk-ECM and days in milking), fed the same TMR: Treatment 1, which is the common cooling methods used in farms (time based cooling), was compare to sensor based cooling regime - treatment 2. The sensor based cooling group showed higher milk fat (3.65 vs 3.43%), milk protein (3.23 vs 3.13%), ECM (42.84 vs 41.48), FCM 4% (fat corrected milk; 42.76 vs 41.34) and lower body temperatures (38.6oC). As seen in figure 1. The preferred cooling regime, after carrying out a series of tests on cooling time and duration along the trial, result with a stabilize animal reaction. The sensor base cooling found to be an effective tool to detect and ease heat stress in intensive dairy cows in arid and semi-arid zones.

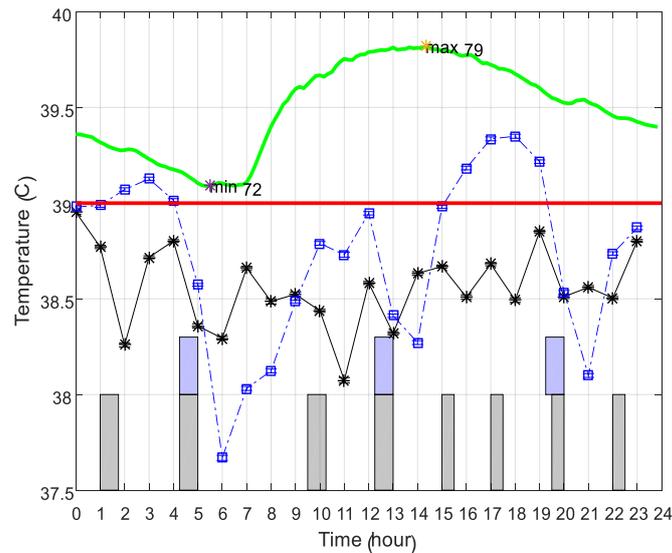


Figure 1. Green line-THI, Red line-39°C threshold on body temperature, blue line-time base cooling (Treatment 1), black line-sensor base cooling (Treatment 2). Blue and black squares mark for time and duration of the cooling groups (blue for time and black for sensor)

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