PROACTIVE FEEDLOT CATTLE MANAGEMENT DURING HEAT WAVES

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Heat waves can result in thermal conditions of an intensity and duration which tax the ability of feedlot cattle to cope. Thermoregulation and feeding behaviour, especially in cattle unacclimatized to summer conditions, can lead to impaired performance, health and well-being, and even death.

Hahn (1995) reported that cattle require about three to four days to balance their heat load, resulting from feed metabolism and exposure to hot conditions, with their heat dissipation capabilities. During hot conditions body temperature diurnal rhythms typically lag ambient conditions by three to five hours, instead of the eight to 10 hours under moderate conditions, while daily means and amplitudes are markedly increased. With continued exposure to high ambient temperature, body temperature will increase over three to four days before peaking, then decrease by 0.1 to 0.4 °C/day, as the animal becomes acclimatized. The diurnal rhythm of body temperature then stabilizes around a new, elevated mean. There is also a marked decrease in feed intake, as cattle attempt to regulate their body temperature. With acclimatization, cattle feed intake will increase but not to pre-heat wave intake levels.

Reduced feed intake during hot conditions impairs growth performance of ad libitum fed feedlot cattle. The general relationships of feed intake and performance with climatic conditions are well known. Recent research in Australia and the USA provide knowledge of shorter term, dynamic responses of feedlot cattle to the onset of heat (Hahn \textit{et al.} 1990; Gaughan \textit{et al.} 1997).

Dynamic responses of cattle to the onset of hot conditions, when combined with analysis of heat waves will allow feedlot managers to use proactive strategies to limit the impact of heat stress on cattle. Managers must develop plans for tactical action if the temperature humidity index (THI) is ≥ 75 (for \textit{Bos taurus} breeds). THI is a derived statistic: THI = 0.8t\textsubscript{db} + RH(t\textsubscript{db} - 14.4) + 46.4; where t\textsubscript{db} = dry bulb air temperature °C, RH = relative humidity in decimal form (Hahn and Mader 1997). Although wind and solar radiation effects are not included, THI is a useful management tool. Vulnerable pens should be identified on the basis of animal breed types, diets, degree of finish/weight, coat colour, and pen exposure (wind, solar radiation). Behaviour of cattle in susceptible pens should be monitored for symptoms indicating excessive heat load, eg panting. Water troughs should be cleaned, and inlets tested to ensure provision of least 15 L/100 kg liveweight each day, with a minimum of 25 mm/100 head trough space and at least two troughs per pen. The water system should provide a minimum of one day storage capacity to meet daily consumption in a four hour high demand period. Increasing water space to 75 mm/100 head and providing additional troughs can reduce the influence of dominant animals during hot conditions. Shades (at least 1.5 m\textsuperscript{2}/head; 2 to 3 m\textsuperscript{2}/head is better) and/or large droplet sprinklers which thoroughly wet the coat of cattle are effective in reducing excessive heat load, especially when humidity is low. Other actions include the postponement of handling and transport, spraying to reduce flies, and possibly restricting feed intake or altering the time of feed delivery. Observation, and the ability to predict hot conditions and quick implementation of strategies to reduce excessive heat load are of paramount importance to effective feedlot management.


