The topic reviewed is the adverse effects of heat stress on cattle feeding behaviour. Heat stress is known to have a negative effect on cattle but the effects on feeding behaviour are especially important because feeding behaviour is correlated with milk production and overall health. Cattle eat by grazing large pastures with other cattle present but there is not much competition between animals which makes studying the behaviour easier. (Skonieski et al 2021) Feeding behaviour can be defined in a number of ways but in general it is any action that is directed towards obtaining food or nutrition. Feeding behaviour and heat stress are usually studied with observation focal animal studies but can occasionally be studied through more traditional experimental means. (West 2003)

Proximately, feeding behaviour is influenced by hunger, food availability and nutrient availability. These factors are studied through continuous sampling by observation of all occurrences of predetermined behaviours. (Najar et al. 2011) Ultimately, dairy cattle have been selectively bred for milk production. This means that unlike when an animal is naturally selected for selectively bred cattle has little variation as a species and is therefore more susceptible to disease, predators and minor changes to climate. (West 2003) It is for this reason of susceptibility that it is important to study the effects of heat stress on the feeding behaviour of cattle.

Ominski et al. (2002), West (2003), Salem et al. (2010), and Najar et al. (2011), were interested in defining how heat stress affects cattle. Ominski et al (2002) found that short term moderate heat stress adversely affects feeding and production. West (2003) found that it is critical to maintain an optimal temperature of -0.5°C to 20°C for cattle to increase feed intake and milk productivity. Salem et al. 2010 found a negative correlation between milk production and heat stress in cows across Tunisia. Najar et al. (2011) found that the relationship between temperature humidity index and milk yield is more sensitive at higher temperature. This suggests that cattle can and do experience heat stress in a variety of climates, under varying lengths of exposure and that heat stress increases with temperature. Furthermore, it is best to maintain an optimal temperature to reduce this heat stress.

Arieli et al. (2004), Shwartz et al. (2009), and Kanjanapruthipong et al. (2015) were interested in understanding how shifting dietary parameters affected feeding behaviour in heat stressed cows. Arieli et al. found that replacing a portion of forage fiber diet with soy hulls increased eating rate was 10% faster and meal duration was 20% shorter. Shwartz et al. found that although cows fed the yeast diet did not have a significant impact on reducing the negative effects of heat stress. Kanjanapruthipong et al. (2015) found that cows fed non forage fibers (soy hulls and cassava residues) had an increased dry matter intake during the day by increasing meal size and length and lying duration ($P<0.01$). This suggests that diets and supplementation increases feeding behaviour under heat stress.

Miller-Cushon et al. (2019), Corazzin et al (2021), and Skonieski et al (2021) were interested in understanding how different levels of heat stress affect feeding behaviour. Miller-Cushon et al (2019) found that during both acute and chronic heat stress, cows preferentially sorted for the long particle fraction in food. Corazzin et al. (2021) found that mild heat stress (72>temperature humidity index>78) affected the feeding behaviour by reducing the time and number of chews of rumination and the number of boluses. Skonieski et al (2021) found that cows had greater thermal stress accumulation in conventional pastures which decreased their digestive activity and forced them to spend more time in unfavourable positions which may lower their milk productivity. This suggests that heat stress negatively affects feeding behaviour at all levels but higher heat stress has a greater effect on feeding behaviour.

Most of how heat stress affects cattle and how differing levels of heat stress affect feeding behaviour is already known. In future studies, researchers could focus on further manipulation of supplementation and feeding strategies in heat stressed cows to observe the effects and find strategies to reduce heat stress. Strategies could include cooling methods and shading covered briefly in some studies.

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