

Impact of Shade on the Panting Score of Feedlot Cattle

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During summer feedlot cattle are often faced with 3 or more days of consistent high temperatures (T_A), high humidity (RH) and low wind speed (WS). This impacts on both the productivity and welfare of the animals. There is increasing pressure to legislate compulsory shade for feedlot cattle. However, there is no conclusive evidence for the amount of shade that should be provided to maintain welfare standards.

One hundred and twenty six Black Angus yearling heifers were used to determine the effect of 4 shade areas. The shade treatments used were: (i) no shade, (ii) 2 m²/head, (iii) 3.3 m²/head and (iv) 4.7 m²/head. Each area was replicated 4 times and the no-shade was replicated twice. Shade was provided by a 70 % solar block shade cloth, attached to a 4 m high frame with a north-south orientation. Cattle were randomly allocated to a pen (9/pen; 19.2 m²/animal). Feed (feedlot finisher) and water were available *ad-libitum*. Climatic conditions (T_A , RH, black globe temperature, WS) were recorded every 10 min. From these data the heat load index (HLI) (Gaughan *et al.*, 2008) was determined. The HLI was divided into 4 categories: cool, HLI<70.0; moderate, HLI>70.1<77.0; hot, HLI>77.1<86.0; and very hot HLI>86.0. Individual panting scores (PS) were collected (Gaughan *et al.*, 2008). These data were used to determine the mean PS (MPS) for each treatment. The MPS is used as an indicator of the severity of heat stress, and is assessed as: MPS = 0 to 0.4 no stress; 0.4 to 0.8 slight stress; 0.8 to 1.2 moderate stress; >1.2 high stress (Gaughan *et al.*, 2008). On days when the maximum HLI was predicted to be <86, data were collected at 0600, 1200 and 1800 hour. When the maximum HLI>86 data were collected every 2 hours between 0600 and 1800 hour.

The MPS increased in all treatments when the HLI category shifted from cool to moderate (Figure 1). There were small changes in MPS between moderate and hot conditions, and larger ($P<0.01$) increases when conditions changed from hot to very hot. Mean panting scores were similar ($P>0.05$) between treatments under cool, moderate and hot conditions. Under very hot conditions the MPS was greatest ($P<0.001$) in the un-shaded cattle. The MPS of these cattle (1.21) indicates that the cattle are in the high stress category. The shaded cattle all moved into the moderates stress category. There were no differences ($P>0.05$) between the shaded treatments when under any HLI classification.

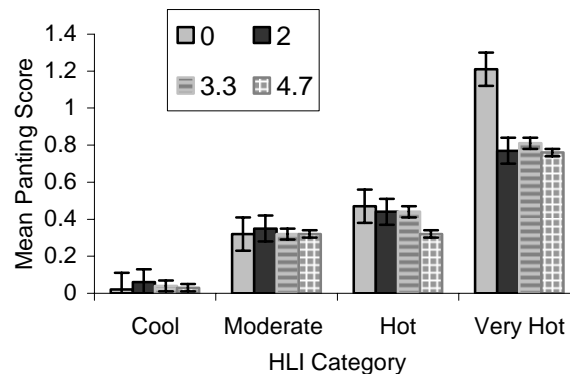


Figure 1 The MPS for cattle with no access to shade (0), access to 2.0 m² of shade/head, 3.3 m² of shade/head, and 4.7 m² of shade/head, when HLI was classified as cool (HLI<70.0), moderate (HLI 70.1 – 77.0), hot (HLI 77.1 – 86.0) and very hot (HLI>86)

Based on the findings from this study, a shade area within the range of 2 – 4.7m²/head appears to have a beneficial welfare impact (lower MPS) for feedlot cattle under very hot conditions. However, the shade areas used did not completely remove the negative impact of very hot conditions. The impact of shade will be affected by stocking density, the type, height and the orientation of shade used.

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