

Effect of Pen-Surface Temperature and Trace Mineral Source on Infrared Hide Temperature in Cattle Raised in Confinement Under a Natural-Feeding Protocol in Summer

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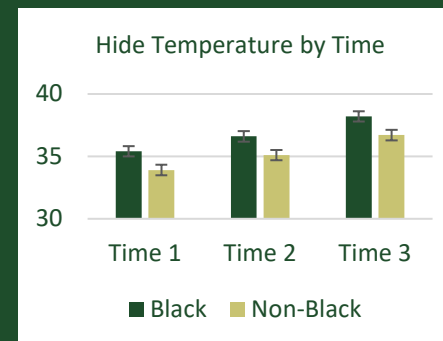
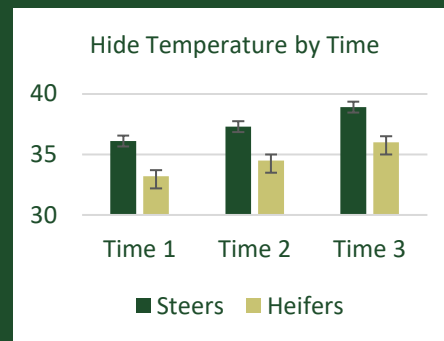
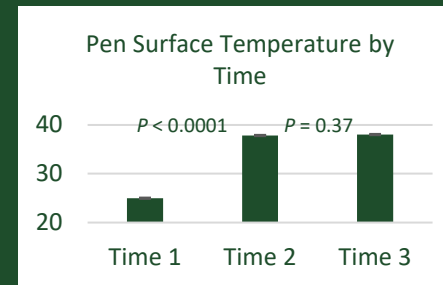
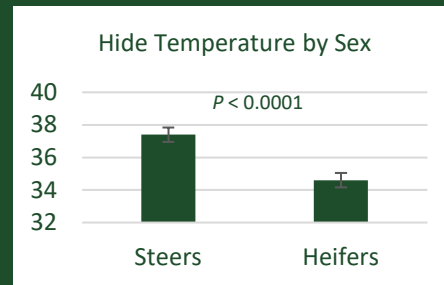
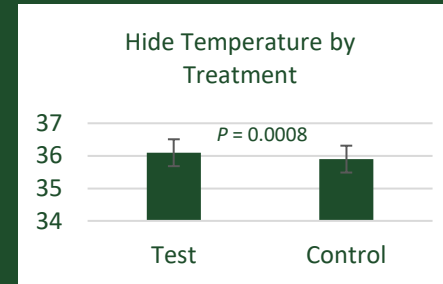
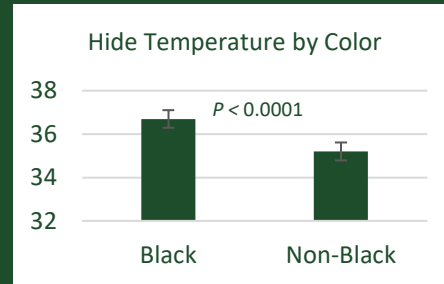
Objectives

- Evaluate effects of trace mineral source on hide temperature
- Evaluate correlation between pen surface temperature and hide temperature

Materials/Methods

- 32 pens (249 – 282 animals/pen) of beef cattle blocked by arrival date and sex, with 2 treatments:
 - 1) Control, with inorganic sources for all trace minerals of interest
 - 2) Test, with ProPath (Zinpro Corporation, Eden Prairie, MN) used to provide additional AA complexes of Zn and Mn, complexed Co, and ruminally-protected folic acid
- Observations made twice monthly from June – September at the following times on each observation day (all times ± 30 min):
 - Time 1) 0700 – 1000
 - Time 2) 1015 – 1315
 - Time 3) 1430 – 1700
- Temperature observations made using a Fluke VT04 (Fluke Corporation, Everett, WA) visual infrared thermometer
- Within each pen, temperature observations made on 10 locations on pen surface and caudal to left glenohumeral joints on 10 black-hided cattle and, where available, 10 non-black-hided cattle

Results (all temperatures degrees C)



Hypothesis

- Supplementing organic forms of trace minerals will lessen impacts of heat stress
- Pen surface temperature will be correlated with hide temperature

Conclusions

- Hide temperatures correlated ($R^2 = 0.43$) with pen surface, suggesting surface cooling may be an effective tool for combating heat stress
- Trace mineral source had an effect on hide temperature, though significant interaction with date (treatment within date interaction $P < 0.0001$)
- Further observation warranted to correlate hide temperatures with visible signs of heat stress such as panting and open-mouth breathing
- Further observation warranted to correlate hide temperatures with weather effects such as temperature humidity index
- Further observation warranted to determine best location for hide temperature observations

