

MICROCLIMATIC CONDITIONS IN WOODEN CALF HUTCHES AND TARPULIN CALF HUTCHES

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Introduction

Calf hutches are one of the most effective management practices for improving health and growth of calves prior weaning. Hutches provide isolation, a critical component of calf rearing prior weaning. Properly designed hutches provide excellent natural ventilation which can further reduce incidence of respiratory diseases (Quigley, 2001). The most common calf hutches are wooden calf hutches and polyethylene calf hutches (Coleman *et al.*, 1996; Pace, 2004). Two years ago the tarpaulin was used as new material for calf hutches (Doležal *et al.*, 2003). The aim of this study was to find out and to compare microclimatic conditions in wooden calf hutches (CHW) and tarpaulin calf hutches (CHT) in spring period and summer period because hutches must provide very good environmental conditions necessary for raising healthy calves (Pace, 2004).

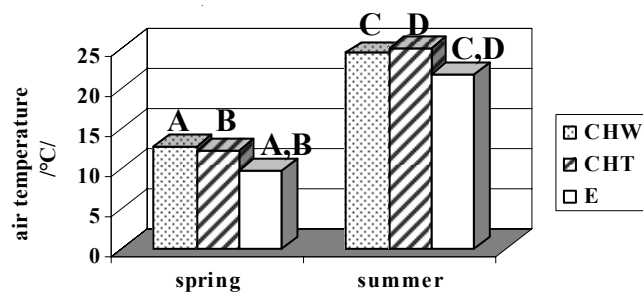
Material and methods

Six individual wooden calf hutches and six individual tarpaulin calf hutches were tested. Tested hutches were located an area under a supplemental shade structure. All hutches were oriented east to west. During spring period (March – June) and summer period (June – September), air temperature, relative humidity (by digital thermometer TESTO 615) and air flow (by digital anemometer TESTO 415) were measured in hutches and in exterior (E). Data were recorded twice weekly from 0930 to 1030 h. The obtained values were processed by Statistika Complet.cz, StatSoft, USA (ANOVA).

Results

Results are showed in Fig. 1 – 3.

Fig.1: Air temperature in calf hutches and exterior



A, B, C, D...P<0.05

Fig. 2: Relative humidity in calf hutches and exterior

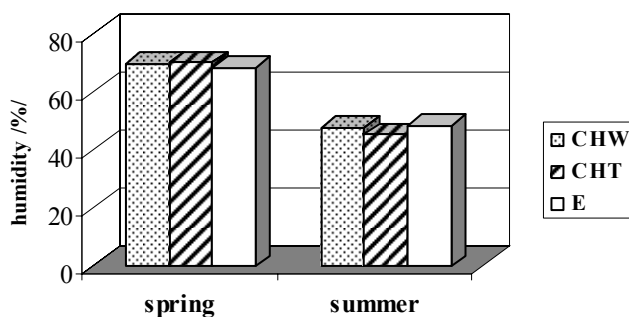
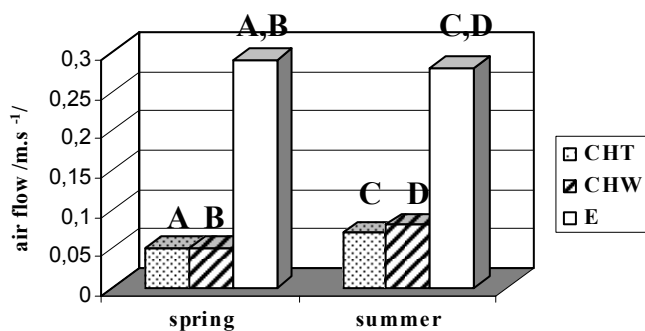


Fig.3: Air flow in calf hutches and exterior



A, B, C, D...P<0.05

Air temperature in hutches showed statistically significant differences ($P<0.05$) compared to exterior air temperature in both periods (spring: CHW 12.76 ± 7.34 °C, CHT 12.24 ± 7.57 °C vs. E 9.75 ± 6.74 °C; summer: CHW 24.41 ± 4.90 °C, CHT 24.98 ± 5.03 °C

vs. E 21.57±5.07°C). No significant differences were found out between hutches. The differences in relative humidity were not found out to be significant. Air flow showed statistically significant differences ($P < 0.05$) between hutches and exterior air flow in both period (spring: CHW 0.05±0.03 m.s⁻¹, CHT 0.05±0.03 m.s⁻¹ vs. E 0.29±0.25 m.s⁻¹; summer: CHT 0.07±0.03 m.s⁻¹, CHW 0.08±0.03 m.s⁻¹ vs. E 0.28±0.09 m.s⁻¹). No significant differences were found out between hutches.

Discussion

The environment of modern housing system has a major influence on animal welfare, health and performance (Wathes *et al*, 1991). In our experiment the difference in air temperature of wooden calf hutches and new type of hutches - tarpaulin calf hutches was not evidenced. But in summer period air temperature in calf hutches was found out on higher level compared with exterior. The high air temperature can create inadequate rearing environment and can affect thermal comfort of housed calves (Coleman *et al*, 1996). Also lower air flow in both hutches is not suitable and creates thermal discomfort in summer. Holmes *et al*. (1983), Spain and Spiers (1996) recommend good ventilation in warm climates, which is important to maintaining a comfortable environment for calves.

Conclusion

Wooden calf hutches and tarpaulin calf hutches showed the identical microclimatic conditions. Both types of calf hutches eliminated exterior air flow and showed higher air temperature compared with exterior in both periods. But low air flow and increased air temperature in hutches are undesirable in summer period and can deteriorate rearing environment for calves from point of view of their thermal comfort.

Acknowledgements

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