INFRARED THERMAL IMAGES AND HEAT LOSS OF JERSEY HEIFERS FED CHITOSAN AND WHOLE RAW SOYBEANS

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Chitosan has been extensively studied during the last decade and has increased the ruminal propionate production. The aim of this study was to evaluate the infrared thermographic and heat losses in Jersey heifers supplemented with chitosan and whole raw soybeans. Eight animals with average body weight of 158.62 ± 1.75 kg were used in two 4x4 Latin squares, in 2x2 factorial arrangements. The experimental period was 18 days with 12 for adapting experimental diets, 6 for data collection, and 5 days of wash out. The experimental diets were: control (CON), chitosan (CHI, inclusion of 2.0% DM of chitosan), whole raw soybeans (WS, 16.3% of WS on diet DM), and chitosan + whole raw soybeans (CHI+WS). Diets were formulated to achieve an average daily gain of 700.0 g d^{-1}. Infrared thermal images were performed on days 15, 16 and 17 of each experimental period before (time 0) and 2, 4, 6 and 8 hours after the morning feeding using a thermal camera (Testo 880). The anatomical regions assessed by thermal camera were: left and right flanks, rump and head. Total sensible heat loss (Q) was calculated as function of heat loss by radiation (Qr) and by convection (Qc). Data were submitted to analysis of variance using the PROC MIXED by SAS version 9.0, adding to the model the fixed effect of time (hours) in relation to the feeding, and it interaction with treatments, also as fixed effect. Infrared thermal images from left and right flanks, hump and head of heifers were not altered by treatments. Moreover, heifers fed WS showed lower heat losses by radiation, convection (P = 0.035), and total heat losses compared to the other treatments. Time effect was observed on heat losses by radiation, convection, and total heat losses. Heifers fed WS showed lower heat losses by radiation at 4 and 8 hours after feeding, for convection at 0, 2 and 8 hours after feeding and total losses at 0, 2, 4, 6 and 8 hours after feeding. The lower heat losses by radiation, convection and total heat losses observed in heifers fed WS can be explained by the EE dietary content (7.20%).Chitosan did not affect body surface temperature and heat losses. Whole raw soybeans decreased the total heat losses of animals. The association of CHI and WS did not positively influence the heat losses of dairy heifers.

Keywords: chitin, heat stress, metabolism, fat source

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