Two metabolizable energy levels in the last third of gestation of beef cows on placenta efficiency

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Poor pasture quantity and quality availability is common for animals grazing native pastures during winter in Uruguay. Cow-calf systems are usually subject to energetic restrictions during late gestation as a result of spring calving. Evidence on the effect of an energetic restriction in the last third of gestation on key variables such as placental efficiency of beef cows is scarce. The objective of the experiment was to evaluate live weight of female calves, placenta structure and the efficiency of the placenta and the cotyledons. The experiment was carried out in Uruguay (33°S, 56°W). Twenty-two pregnant cross-bred cows carrying female calves were assigned at day 199 of gestation, to one of two treatments: a) cows fed a TMR calculated to provide 125% of the metabolizable energy requirements (high, H, n = 11); b) cows fed a TMR calculated to provide 75% of the metabolizable energy requirements (low, L, n = 11), according to NRC 2000. Experimental period was 81 days and live weight of female calves was registered at birth. All the placentas were collected and weighed and total number of cotyledons counted. Placental efficiency was calculated for each treatment based on the live weight of the calves as a function of the weight of the placenta. Cotyledons efficiency was calculated for each treatment based on the live weight of the calves as a function of the glandular mass (glandular mass = weight by number of cotyledons). Statistical analysis was performed using mixed linear model (SAS 9.3), with treatment and age of the mother as fixed effect and sire and cow biotype as randomized effects. Female calves in H treatment tended to be heavier at birth (P = 0,09) than those from L treatment (mean ± em; 34.9 ± 2.59 vs. 32.9 ± 2.49 kg). Placenta weight was similar (P = 0,18) between treatments (4.65 ± 0.78 vs. 4.18 ± 0.76 kg, H and L respectively). No differences were found (P = 0,31) on total number of cotyledons (97.3 ± 9.75 and 88.3 ± 8.23 for H and L, respectively). Placental efficiency was not different between groups (P = 0.63, H = 8.2 ± 1.0 and L = 8.4 ± 1.0) nor the cotyledons efficiency (P = 0.98, H = 18.1 ± 5.77 and L = 18.1 ± 5.37). Energy restriction in the last third of gestation did not affect the efficiency of the placenta under the conditions of the present study.

Keywords: fetal programming, energy restriction, placenta efficiency

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