The objective of this work was to evaluate the effect of oral Mg supplements on intracellular and extracellular macro element concentrations in breeding cows with nutritional restrictions between the last third of the gestational period up to 45 days after birth. Three groups of 15 pregnant Aberdeen Angus cows each, were used in this study. Group 1 received a magnesium oxide supplement in addition to free access to agropyron and fescue pastures. Group 2 did not receive mineral supplements but did have access to the pastures. Group 3 had nutritional restrictions during the pre-partum period, with access exclusively to agropyron hay.

Six samples of blood, forage and drinking water were collected. Blood serum, erythrocytes and forages were subjected to atomic absorption spectrophotometry in order to determine Mg, Ca, Na and K levels. Phosphorus levels were determined through colorimetry in serum and grass samples. Drinking water was used to measure Ca, Mg and Na through atomic absorption spectrophotometry and total salt levels were obtained through gravimetric analysis. The data set was analyzed through ANOVA and groups were compared using Duncan’s Test (MRT). Magnesium concentrations in pastures and hay were below 0.20% dry matter. No significant differences were observed on serum Mg levels among groups, although group 1 presented the highest levels throughout the study. Intracellular Mg levels were consistently lower than extracellular levels in all groups. During postpartum, erythrocytes magnesium levels increased for all groups. At the time of the last sample collection, animals from groups 1 and 2 exhibited a body condition value of 6 while group 3 presented a body condition value of 4. The animals from groups 1 and 2 gained 26 kg and 16 kg respectively while those from group 3 lost 44 kg. Weaning percentages were 93.3% for groups 1 and 2 and 66.6% for group 3. Weights at birth for calves belonging to animals in group 3 were lower (<4 kg) than those belonging to groups 1 and 2 (p<0.05). The magnesium decrease in plasma occurred earlier than the erythrocytes magnesium decrease. This suggests that plasma magnesium measurements are a more sensitive and earlier indicator to detect significant Mg level decrease than intracellular measurements. No significant differences were observed among the analyzed biochemical parameters. However, group 3 presented more productive losses than group 1 and 2. Even though clinical sign linked to hypomagnesaemia were not observed in group 3, this type of nutritional management may encourage productive losses that must be evaluated at the time of implementing such a nutritional strategy.
Keywords
Bovine, Hypomagnesemia, Mineral supplementation, Nutritional restriction.