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Nutrient intake, digestibility, mastication and ruminal fermentation of Pelibuey lambs fed finishing diets with ionophore (monensin or lasalocid) and sodium malate

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Abstract

The effects of fermentation and digestion characteristics of lambs fed high grain finishing diets with two ionophores (monensin and lasalocid) were compared, and the additive response of malate in rations containing ionophores were evaluated. Twenty 4-month-old Pelibuey lambs, weighing approximately 16 kg, were assigned to a completely randomize designed experiment with a 2 × 2 factorial arrangement of treatments (two ionophores with or without malate). The four treatment groups (diets) were: (1) diet with 30 parts per million (ppm) lasalocid, (2) diet with 30 ppm lasalocid and 0.3% malate, (3) diet with 30 ppm monensin, and (4) diet with 30 ppm monensin and 0.3% malate. Animals were confined to individual metabolic cages. Body weight during the sampling phase averaged 20.6 kg. Lambs fed diets with monensin had a 10.9% lower ($P < 0.05$) dry matter (DM) intake (g/kg$^{0.75}$) than those fed lasalocid. Malate had no effect ($P > 0.05$) on DM intake. Lambs fed monensin had lower ($P < 0.01$) NDF intake (37.8%) than those fed lasalocid. When malate was included in the diet, NDF intake was also reduced ($P < 0.05$) by about 25%. However, no difference ($P > 0.05$) in NDF or NFC digestibilities was observed between ionophores or by the addition of malate. Although time spent ruminating was 33% lower ($P < 0.05$) for lambs fed monensin diets, time dedicated to eating was not different ($P > 0.05$) between ionophores. Ruminal pH was similar ($P > 0.05$) for all treatments (5.8). Type of ionophore had no effect ($P > 0.05$) on concentration or molar percent of VFA, whereas the inclusion of malate increased ($P < 0.05$) acetic acid concentration in rumen fluid (60.5 mM vs. 48.2 mM). Nitrogen balance was greater for lambs fed lasalocid diets, which had a higher crude protein intake, than lambs fed diets with monensin. Lambs fed diets with monensin or malate consumed less NDF, and dedicated less time to ruminate than those fed lasalocid. Lambs on the lasalocid diets consumed more fiber, which might be attributed to a greater selection of fibrous components of the diet.

Keywords: Ionophore; Malate; Intake; Digestibility; Ruminal fermentation