Methane emission in two meat lambs production systems on pasture in subtropical climate

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The agricultural sector accounts about 20% on total global greenhouse gases (GHG) emissions from anthropogenic origin and it is expected that these rates increase according to the population growth. In addition, the deforestation produces about 17% emissions and, including the agricultural sector, is responsible for 33,3% of global GHG emissions. In this context, the ruminant is responsible for much of the methane emission from all agricultural activities, due to its enteric and ruminal fermentation. This study aimed to quantify the emissions of enteric methane in two systems of meat lambs production. The systems were: 1) production of suckling lambs finished on pasture and 2) production of lambs on pasture, weaned and supplemented with 2% BW of concentrate. The experimental design was randomized blocks with four replications (paddocks). Dorper and Suffolk crossing breed was used with three animals per plot. For calculation of methane emission, it was considered ewes (mothers) plus lambs (system 1) and weaned lambs (system 2). The experimental period was from November 2013 to February 2014 on pastures of *Cynodon spp* (Tifton 85) and *Paspalum spp*. The grazing method was continuous and variable stocking, according to the *put and take* technique. To measure enteric methane the marker sulfur hexafluoride (SF6) was used. The collect was performed using air cylinders that were emptied before vacuum-adjusted capillary tube on the animal's head. The capillary flow was scaled so that the cylinders were replaced every 48 hours totaling three collections in six days of evaluation. Additionally, two tubes were placed in the experimental area for taking atmospheric air, and the values used as "blank" for the calculations. After collected, container was pressurized with nitrogen and the concentrations of methane and SF6 were determined using gas chromatography. T-test was used as statistical test. The two production systems showed no significant differences ($P>0.05$) in methane emissions ($g.day^{-1}$). The system with lambs and ewes produced 17.71 CH_4 $g.day^{-1}$ while the supplemented weaned lambs (system 2) produced 13.11 $g.day^{-1}$. When evaluated just the emission of the lambs in the two systems, weaned and supplemented lambs showed higher emission (13.11 CH_4 $g.day^{-1}$) than the suckling ones (5.47 CH_4 $g.day^{-1}$; $P<0.05$). Supplemented lambs emitted more methane, although studies with ruminants show that higher emissions are generally associated with higher dry matter intake (DMI) and diets with lower energy density. Probably the higher DMI by the supplemented lambs may explain these results, as evidenced by upper performance ($P<0.01$) of the animals in that system. However, daily CH_4 emission ($g.day^{-1}$) was similar on both systems of production.

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