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The difference in the thickness of the intestinal mucosa between Santa Ines and Ile de France lambs naturally infected with intestinal nematodes

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Gastrointestinal nematode infections in small ruminants generate major problems in sheep farming, especially in tropical and subtropical regions worldwide. The main species affecting the small bowel are *Trichostrongylus colubriformis*, *Cooperia curticei* and *Strongyloides papillosus*. The infections caused by these parasites impair animal health and welfare, leading to high production losses. More resistant sheep breeds exhibit faster and more robust immune responses, consequently carrying a lower parasitic load. Mucosal hyperplasia is one of the changes caused by the local immune response to limit the parasite's establishment. Thus, this study aims to investigate differences in small intestine mucosal thickness between Santa Ines and Ile de France sheep breeds naturally infected with intestinal nematodes. For this purpose, intestinal tissue was collected from nine Santa Ines and nine Ile de France animals, and the sections were stained with hematoxylin and eosin. The animals were slaughtered, and 10% of the intestinal content was collected from each animal to count and identify the species and developmental stages. Observations and measurements of the mucous membranes were made at 400x magnification using an optical microscope (Olympus BX50) via the Cellsens Standard program (version 4.1). All animal procedures were conducted under ethical standards and were approved by the Animal Use Ethics Committee of FMVZ/UNESP (47/2016). The Santa Ines animals had a mean intestinal mucosal thickness of 1529 μm (± 330) and a parasitic load of 12,946, while the Ile de France animals had a thickness of 1510 μm (± 126) and a parasitic load of 35,119, with no significant difference between the breeds in terms of intestinal thickness ($p = 0.8240$). However, Spearman's correlation analysis revealed a negative correlation between parasitic load and intestinal thickness ($p = 0.032$; $R^2 = 0.0002$). Consequently, we can infer that, despite no significant difference between the mean thicknesses of the intestinal mucosa for the two breeds, increased mucosal thickness may be related to a decrease in the parasitic load.

Keywords: Immune response. Resistant animal. Worm burden. Small ruminants.

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