Gastrointestinal parasites in goats from Monte Castelo, Santa Catarina, Brazil
Parasitas gastrintestinais em caprinos de Monte Castelo, Santa Catarina, Brasil

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Abstract
This study was carried out with the aim of estimating the degree of gastrointestinal helminth infection in goats on the Northern Plateau of Santa Catarina. Twelve young females and 11 adult females were used. Every 28 days, feces samples were taken to quantify the nematode eggs per gram of feces (EPG). Larval culturing was performed on a pool of positive samples from the same group. The fecal egg counts (FECs) ranged from zero to 10,400 EPG in the young group and zero to 7,600 EPG in the adult group. The mean FECs were between 583.3 and 4441.7 in the young group and between 418.2 and 2181.8 in the adult group. Eggs of the order Strongylida and genera Moniezia and Toxocara, and oocysts of Coccidia, were observed. The young animals were more affected and Haemonchus was the most prevalent genus in the samples.

Keywords: Goats, parasitosis, Haemonchus.

The small ruminant industry is an expanding activity that is widely practiced in Brazil, especially in the Northeast region. However, goat farming has also been gradually implemented in other states, including Santa Catarina, which today has a population of about 40,000 goats (IBGE, 2006). Goats are widely exploited in tropical countries for meat, milk and skin production. Gastrointestinal parasitism is an important factor in economic production losses among small ruminants and is considered to be their most serious health problem. This parasitism occasionally makes goat-rearing impracticable (BUZZULINI et al., 2007).

The success of any worm control program among goats and sheep is directly related to knowledge of the population dynamics of the free-living stage in the environment and the parasitic phase in animals (MACIEL et al., 2006).

The present study aimed to estimate the degree of infection and some epidemiological data on gastrointestinal helminths in a goat herd on the Northern Plateau of Santa Catarina. The study was carried out from January to December 2009 on a farm property in Monte Castelo, state of Santa Catarina,

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which during the experimental period had a total of 138 goats without defined breed. The experimental animals were grouped randomly; for this, 12 young females (6-8 months of age) and 11 adult goats without defined breed (over 12 months of age) were used. The animals were individually identified with numbered ear tags and kept together with the general flock. The goat were kept in an exclusive area composed of 2 hectares (ha) of winter pasture (*Avena* ssp. and *Lolium* ssp.) and 5 ha of summer pasture (*Axonopus catarinensis* and *Brachiaria* ssp.), as well as native field and meadow plants, thus totaling 24 ha with a stock density of 0.5 animal unit/ha.

Every 28 days, feces samples were collected directly from the rectum to determine the number of nematode eggs per gram of feces (EPG) (GORDON; WHITLOCK, 1939). Fecal culturing was performed to identify the genera of infective larvae (L3), on a pool of positive samples from the same group (UENO; GONÇALVES, 1998).

In order to avoid cases of mortality, in situations when symptoms of Helminthios, such as pale mucous membranes, bristling and opaque hair, weight loss and submandibular edema and/or fecal egg counts (FECs) of greater than 4000 EPG (AMARANTE et al., 1999) were observed, all the experimental individuals were treated with the objective of maintaining similar sanitary conditions. For this, 5% levamisole hydrochloride was used orally, subsequently replaced by 10% albendazole + 1.35% cobalt sulfate.

The average monthly rainfall, temperature and humidity records were obtained from the specialized Epagri meteorological station, located in Major Vieira, Santa Catarina. The data were subjected to one-way analysis of variance and the means were compared using the Tukey test with a 5% significance level (Minitab, version 11). The data were analyzed after log(x + 1) transformation.

Among the 276 samples analyzed during the experiment, 94.57% were positive for gastrointestinal parasites. Of these, 47.46% were parasitized exclusively by nematodes of the order Strongylida; 27.90% by Strongylida and Coccidia; 10.14% by Strongylida, Coccidia and *Montezia*; 3.99% by Strongylida and the genus *Montezia*; 3.62% only by Coccidia; 0.72% by Coccidea and *Montezia*; 0.36% by Strongylida, Coccidia and *Toxocara*; and 0.36% only by *Toxocara*.

In the state of Paraíba, Martins Filho and Menezes (2001) found that 80.72% of the goat feces samples analyzed were positive for parasites, but in addition to what was seen in the present study, they also found *Trichuris* and *Strongyloides*. With regard to parasitism by Strongylida in the present study, 89.86% of the samples were positive. In the young and adult groups, 95.83 and 83.33%, respectively, eliminated eggs of these parasites in their feces. The FEC ranged from zero to 10,400 in the young animals, and from zero to 7,600 in the adults. The mean FECs for all the collection times were between 583.3 and 4441.7 in the young animals and between 418.2 and 2181.8 in the adult animals. Eggs of *Montezia* spp. and *Toxocara* spp. and coccidian oocysts were also observed. In the adult group, fecal egg elimination was found in 73 to 91% of the animals, varying according to the collection month. In the young animals, this ranged from 83 to 100%. In March and September, all of the young animals shed Strongylida eggs in their feces.

Larvae of *Haemonchus* spp., *Cooperia* spp., *Trichostrongylus* spp., *Ostertagia* spp. and *Oesophagostomum* spp. were identified in fecal cultures. *Haemonchus* was present in over 50% of the samples at most of the collection times, except in September and November, when *Ostertagia* was also abundant. Similar results were observed by Mattos et al. (2003) in Porto Alegre, Rio Grande do Sul, where they also found high prevalence of *Haemonchus*. Contrasting results were found in goats from the region of Porto Alegre, where Cardoso and Oliveira (1993) observed the presence of *Nematodirus*, *Bunostomum*, *Strongyloides* and *Trichuris*. However, this was due to the variation of parasitism between different herds and regions. One important difference found in the present study was the occurrence of the genus *Ostertagia*, which has only been observed in this study and in those conducted in the Porto Alegre region.

This was the first study on goat parasitism in the state of Santa Catarina, where previously only studies on sheep were published, by Ramos et al. (2004). As such, further investigations involving a larger animal group and necropsy are needed in order to provide identification and epidemiological data for parasite species present in goat herds in Santa Catarina.

Correlation coefficients between climatic data (temperature, humidity and rainfall) and FEC were low (−0.3 ≤ r ≥ 0.28) in both groups of the present study. Brito et al. (2009) demonstrated that parasitism was more prevalent in the rainy season, particularly in males, both in goats and in sheep, which was not observed in this study. This was possibly because the humidity was above 72% and the mean temperature was higher than 12.8 °C, at all experimental times, and these climatic factors favored development of parasites in the flock evaluated. As such, infection remained high throughout the months of the year, even in the coldest months, especially in the young animals.

The group of young animals was more affected by parasites (p < 0.05), thus corroborating other reports in the literature showing that the age of these animals is inversely correlated with parasitism. After previous infection with gastrointestinal nematodes, young animals acquire some resistance to the pathogenic effects of these parasites (MARTINS FILHO; MENEZES, 2001).

Concluding, 94.57% of the samples were positive for gastrointestinal parasites, and the genera *Haemonchus*, *Cooperia*, *Trichostrongylus*, *Ostertagia*, *Oesophagostomum*, *Montezia* and *Toxocara* were identified. The young animals were more affected and *Haemonchus* was the most prevalent genus.

### References


