

Study of the gastrointestinal nematodes resistance in Nelore and crossbreed cattle in the state of São Paulo - Oliveira M.C.S.^{1*}, Alencar M.M.¹, Giglioti R.², Oliveira H.N.², Chagas A.C.S.², Beraldo M.C.D.³

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The resistance to natural infection by gastrointestinal nematodes was compared in 45 male and female cattle of two genetic groups: Nelore (NI, n=28) and "three cross" $\frac{1}{2}$ Angus + $\frac{1}{4}$ Canchim + $\frac{1}{4}$ Nelore (TC, n=17). The animals were monitored for 24 months during which they remained in tropical pastures without anti-parasite treatment. Every month blood samples were drawn to determine the packed cell volume (PCV) by the microhematocrit technique, while feces samples were collected to count the number of eggs per gram (EPG) and to identify the parasite genera prevalent in the coprocultures. The monthly average PCV values were higher ($P<0.01$) for the NI group (40.6%) than in the TC group (38.6%). There was a significant influence of collection month ($P<0.01$) on the EPG count, but there were no effects noted of genetic group, sex or possible interactions between these effects. The following endoparasites were found in the coprocultures: *Haemonchus* spp., *Cooperia* spp., *Oesophagostomum* spp. and *Trichostrongylus* spp., in the last case in smaller proportion. No significant differences were found between the genetic groups regarding the mean prevalence levels of all the parasites identified, except for *Cooperia* spp., which were present in higher number ($p<0.05$) in animals of the NI group. The results obtained in this experiment confirm previous findings showing greater susceptibility of Nelore cattle to *Cooperia* spp. when compared to animals crossbred with taurine breeds.

Key-words: cattle, parasites, susceptibility

Embrapa project number: 03.09.00.154.00.00

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INTRODUCTION

Cattle nematodes in Brazil are mainly controlled through application of anthelmintics. However, this causes concern about the presence of drug residues in meat and dairy products, prompting studies of alternative control methods (Oliveira et al., 2009). Among these, the selection of animals that are genetically resistant is a very promising complementary strategy (Coppieters et al., 2009). The present experiment was design to evaluate the differences in resistance/susceptibility to endoparasites of Nelore and "three cross" ½ Angus + ¼ Canchim + ¼ Nelore.

METHODS

✓Animals: 45 male and female cattle of two genetic groups: Nelore (NI, n=28) and "three cross" ½ Angus + ¼ Canchim + ¼ Nelore (TC, n=17).

✓Collections and analysis the animals were monitored for 24 months during which they remained in tropical pastures without anti-parasite treatment. Eggs per gram (EPG) of feces, and fecal cultures were prepared monthly. The packed cell volume was determined by the microhematocrit method.

✓Statistics: the total EPG and EPG data by parasite genus were transformed to log 10 (n + 1). The data were analysed using the MIXED PROCEDURE of the Statistical Analysis Systems Institute (SAS, 2002/2003). The REPEATED measures analysis of PROC MIXED was used for EPG and PCV data. The fixed effects included in the model were genetic group, month/year of collection and interaction. The random variables fitted were animal and sire, nested to genetic group.



Figure 1. Gastrointestinal helminth eggs (a); structures of adult *Haemonchus* spp (b) and infective larvae of gastrointestinal helminths (c)



Figure 2. Nelore animal (a) and animal born of cows Canchim ½ + ¼ Nelore inseminated with Angus (b).

RESULTS

The monthly average PCV values were higher (P<0.01) for the NI group (40.6%) than in the TC group (38.6%). There was a significant influence of collection month (P<0.01) on the EPG count, but there were no effects noted of genetic group, sex or possible interactions between these effects. The EPG for the genetic and monthly precipitation are shown in Figure 1.

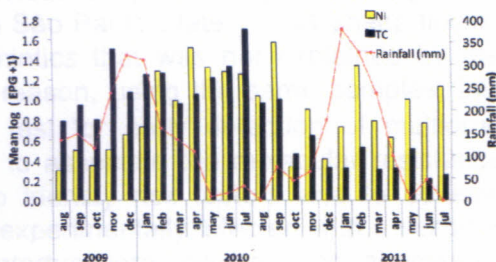


Figure 3. Monthly variations of the counts of EPG (log10(n+1)). NI= Nelore; TC= Three cross.

The following endoparasites were found in the coprocultures: *Haemonchus* spp., *Cooperia* spp., *Oesophagostomum* spp. and *Trichostrongylus* spp., in the last case in smaller proportion (Table 1). No significant differences were found between the genetic groups regarding the mean prevalence levels of all the parasites identified, except for *Cooperia* spp., which were present in higher number (p<0.05) in animals of the NI group.

Table 1. Means followed by standard errors of the helminth species identified by genetic group. NI = Nelore TC = Three-cross

Group	Species of infective larvae			
	<i>Haemonchus</i>	<i>Trichostrongylus</i>	<i>Cooperia</i>	<i>Oesophagostomum</i>
NI	0.48±0.05	0.14±0.02	0.43±0.05	0.21±0.04
TC	0.56±0.07	0.12±0.02	0.21±0.07	0.27±0.05

POTENTIAL IMPACTS ON SOLVING ANIMAL HEALTH ISSUES

The results obtained in this experiment confirm previous findings showing greater susceptibility of Nelore cattle to *Cooperia* spp. when compared to animals crossbred with taurine breeds.

Co-financial support (Embrapa 03.09.00.154.00.00)

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