

Influencing Factors of Infestation of Endo and Ectoparasites on Hair Sheep in Tropical Ecuador.

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Abstract

120 hair sheep were tested for faecal, skin and blood parasites. After three parasitological studies in humid Sucumbíos, it was proved that the parasitic charge is influenced by different factors. In the case of air temperature and humidity there was no variation detected between the seasons, although the parasitical charge rose in the course of this study. With regard to parasitic charge some systematic differences were found between the farming systems. Prophylactic measures such as rotational grazing, guarantee the food alternatives in the case of grass shortage, the strategic treatment with de-wormers and removal of excrement and garbage were recommended.

Keywords: endoparasites, ectoparasites, cattle, hair sheep, rotational grazing, season, farming system, prophylactic measures

1 Introduction

A GTZ (German Agency for Technical Cooperation) and University of Kassel funded project aimed at examining the parasite condition of hair sheep and cattle in the province of Sucumbíos in Ecuador. Parasites can impair the health of an animal and cause high economic losses. According to the parasitologists factors like farming systems, source of water, salt additive as well as sex, age and breed of the animal play an important role. In this report the farming system, sex, breed and age of sheep are to be analysed.

2 Material and methods

120 hair sheep of the breeds Barbados Blackbelly, Pelibuey and the Ethiopian breed were tested for faecal, skin and blood parasites. These animals were chosen from 25 farms. The chosen farms were classified into four different farming systems: The first one, has separate grazing of hair sheep and cattle on artificial pastures; the second one has free range grazing of hair sheep on artificial pastures, mixed grazing with cattle; the third one has hair sheep grazing in coffee and cocoa plantations and the last one has a mixture between farming system 2 and 3. The climate in the survey region is perhumid as typical for tropical rainforests. The annual rainfall is between 3,500 and 5,400 mm. The average temperature is between 23.9 and 26.5 °C.

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For faecal tests flotation, sediment and migration methods were used to test for gastrointestinal, liver and lung parasites. The WOO and IFAT tests were used to test for blood parasites. The skin specimens were microscopied directly after removal to test for ectoparasites. The above mentioned factors were analysed statistically to find out whether they are significant for the various kinds of parasite. Considering the animal management and the grassing system, the farming system was assigned to one of four groups, ranging from very good to bad. Numbers were assigned to the tree breeding types: Barbados Black belly being group one, Pelibuey the second one and the crossover between those two represented group three. Another classification parameter was the age, resulting in three groups: the first one was composed by animals aged between one and six months, the second one included animals between six and twelve months of age. The last one consisted of animals older than twelve months. We also differentiated between male and female animals each represented a separate group.

3 Results

3.1 Breed

The statistical effect of breed in the different helminths was not significant (Tab. 1a). The analysis of protozoae showed different results. *Trypanosoma spp.* revealed a high significance, while *Eimeria spp.* was significant at a 5% level (Tab. 1b). The analysis of *Tabanus* in arthropods also displays a high significance (Tab. 1c).

3.2 Sex

We did not find significant differences between the male and female animals in arthropods and protozoae. (Tab. 1a-c).

3.3 Season

The first season between July and September 1997 was dry with a relatively high humidity. In the second season from October until December 1997 the temperature and the humidity remained constant - later, rainfall increased. Due to high rainfall the development and reproduction of parasites was high between February and April 1998. Significant increase in parasite population was seen during transition from one season to another, especially in helminths, where this factor has the greatest significance (see Tab. 1a). Table 1c displays a high significance in *Eimeria spp.*, while the results in *Trypanosoma spp.* were non-significant. *Bovicola spp.* was the only ectoparasite showing non-significant results in relation to the season (see Tab. 1c). Figure 1 shows that the infestation of Hair Sheep with helminths increased along the study. The infestation with endoparasites, especially *Strongyloides spp.*, *Haemonchus spp.* and *Trichostrongylus spp.* was very high between the second and the third season, coinciding with the beginning of the rainy season. The infestation with *Bunostomum spp.* did not show variations according to weather conditions.

Table 1: Results of LSQ-Variance Analysis of Endo- and Ectoparasites in Hair Sheep

<i>Characteristics</i>	<i>Factors</i>				
	<i>Breed</i>	<i>Sex</i>	<i>Season</i>	<i>Age</i>	<i>Farming system</i>
FG	2	1	2	2	3
<i>Helminths (a)</i>					
Chabertia	n.s.	n.s.	***	**	***
Bunostom.	n.s.	n.s.	***	***	***
Oesophag.	n.s.	n.s.	***	***	***
Strongyl.	n.s.	**	***	***	***
Haemonchus	n.s.	**	***	***	***
Ostertagia	n.s.	**	***	***	***
Trichostr.	n.s.	**	***	***	***
Moniezia	n.s.	n.s.	***	**	***
Fasciola	n.s.	n.s.	n.s.	n.s.	n.s.
Dyctiocau.	n.s.	n.s.	***	***	n.s.
<i>Protozoae (b)</i>					
Trypanosoma	***	n.s.	n.s.	**	***
Eimeria	*	n.s.	***	**	***
<i>Arthropods (c)</i>					
Boophilus	n.s.	n.s.	***	***	n.s.
Chorioptes	*	n.s.	***	***	n.s.
Psoroptes	n.s.	n.s.	***	n.s.	n.s.
Bovicola	n.s.	n.s.	n.s.	n.s.	***
Dermatobia	n.s.	n.s.	*	**	**
Tabanus	***	n.s.	***	n.s.	***

*** significant at 0,1%, ** significant at 1%, * significant at 5%, n.s non-significant

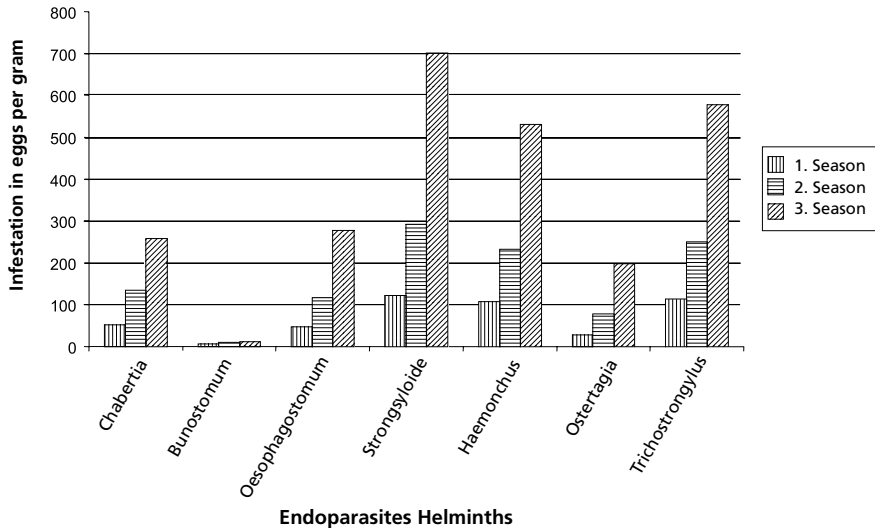
3.4 Age

The age of the animals played a major role (see Fig 2). *Boophilus microplus* and *Dermatobia hominis* showed the greatest significance in relation to the age (see Tab. 1c).

3.5 Farming system

Only in *Fasciola hepatica* and *Dictyocaulus spp.* the farming system had no effect on their population (Tab 1a). Table 1d shows great differences between the effect of the farming system on the populations of *Bovicola spp.*, *Dermatobia hominis* and *Tabanus spp.*.

Figure 1: Influence of the season in the infestation of Hair Sheep Endoparasites (Helminths).



4 Conclusions

Climate conditions like rain, temperature, season and humidity can positive or negative influence the development of parasites of ruminants in external conditions. These variables could have an effect on the size and form of the different parasites (CRAIG and WISKE, 1995). The infestation with parasites can change in dependence to climate changes. In dessert regions is the infestations with parasites low, while in the tropic and subtropic it can be high, especially endoparasites like *Cooperia* and *Oesophagostomum spp.*. In countries with seasons are *Trichostrongylus*, *Cooperia* and *Ostertagia spp.* the most common endoparasite (SUAREZ and Busetti, 1994). According to DELGADO (1989) temperatures between 25 and 30°C and very high humidity facilitates the development of different kinds of parasites. Low or really high temperatures retard this development. In our study, the infestation with endoparasites, especially *Strongyloides spp.* and *Haemonchus spp.*, was very high between the second and the third season, coinciding with the beginning of the rainy season.

Figure 2: Influence of the age in the infestation of Hair Sheep Endoparasites (Helminths).

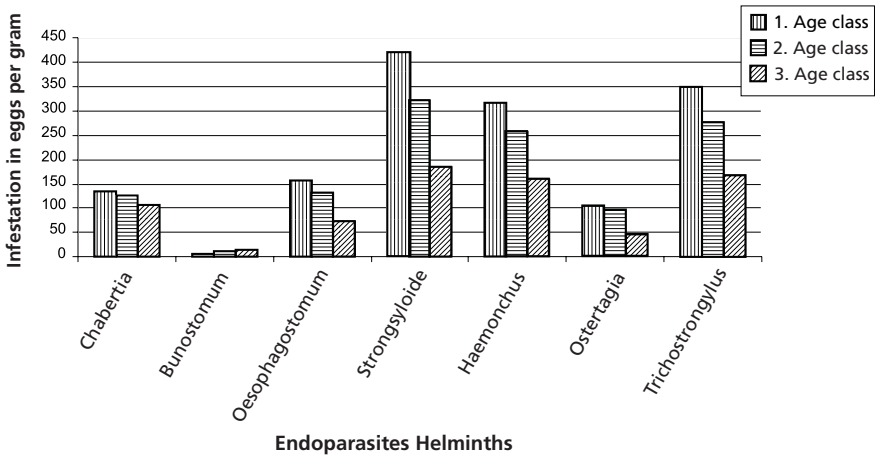
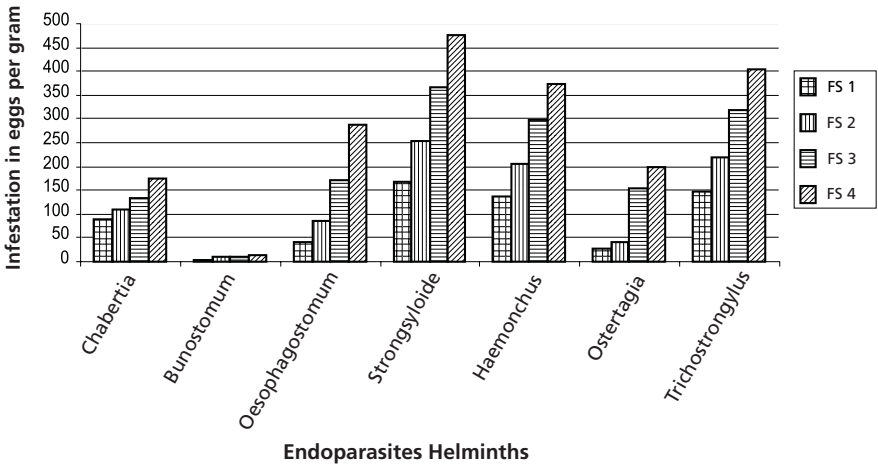


Figure 3: Influence of the farming system in the infestation of Hair Sheep Endoparasites (Helminths).



Animals aged between one and six months were more susceptible to acquiring parasitic diseases, since their immune system is not completely developed yet (BOWMAN, 1999).

One of the most important aspects for the classification of the farming systems in Sucumbíos-Ecuador was the rotational grazing, that consisted on the transfer of animals from infected grasses to dry or parasites free grasses. In the first and second farming systems, this measure took place, but not in the other two (FISCHER *et al.*, 2000), that is because the parasitic charge was in the third and fourth group higher. Free range grazing was the most practised form of keeping, the labour input minimized. Scientists from Cuba (DELGADO, 1989) verified a reduction of infections with *Dictyocaulus viviparus* by rotation with a standby from about 33 days.

References

- BOWMAN, D. D.; *Georgia's parasitology for veterinarians*, 7th ed; Saunders; 1999.
- CRAIG, T. M. and WISKE, S. E.; Control programs for internal parasites of beef cattle; *Compendium of continuing education*; 17(4):579–587; 1995.
- DELGADO, A.; Comportamiento de *Strogylatos* del bovino en el ambiente externo y su importancia en el control de estas helmintosis; *Revista cubana de ciencias veterinarias*; 20(2):127–142; 1989.
- FISCHER, J., CLAUS, C. and HERRERA, A.; *Bedeutung der Haarschafhaltung für die nachhaltige Nutzung der Regenwaldrandgebiete Südamerikas*; Ph.D. thesis; Dissertation Universität Kassel; 2000.
- SUAREZ, V. H. and BUSETTI, M. R.; Efecto de una estrategia de control de las parasitosis internas en la productividad de la cria bovina; *Veterinaria Argentina*; 9,102:88–96; 1994.