

Nematode Infection on Beef Cattle in Two Different Productive Regions of Argentina's Northwest



Suarez VH*, Martinez GM, Micheloud JF

AISA, IIACS-CIAPINTA-EEA Salta, Cerrillos, Salta, Argentina

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*Corresponding author: Suarez VH, AISA, IIACS-CIAP INTA-EEA Salta, Ruta Nacional 68 km 172 (CP: 4403) Cerrillos, Salta, Argentina, E-mail: suarez.victor@inta.gob.ar

Abstract

Cattle production in northwest Argentina (NOA) in the last 10 years has grown in importance. However, this growth of livestock brought productive and health constraints such as infection with gastrointestinal nematodes (GIN). Nematode infection may reduce productivity of grazing cattle [1-5]. Free-living forms of GIN exhibit a close relationship with climatic factors, the environment and animal management, affecting GIN development, survival and final infestation rate of pastures [1-7]. Thus, there are marked differences in epidemiology and effect of GINs among regions and production systems. The NOA region is characterized by a subtropical climate with a dry winter season and summer rainfalls, and the presence of different agroecological regions. These areas have been largely modified by human activities and are used for cattle raising such as Chaco Semiarid forests (CSF) and piedmont forests and grasslands (PFG).

Knowledge about the GIN of beef cattle in the NOA is scarce [4], particularly for CSF and PFG regions. Therefore, the aim of this work was to study the epidemiology of GINs and their effects on replacement beef heifers in representative productive systems of CSF and PFG regions.

Abbreviations: NOA: Northwest Argentina; GIN: Gastro Intestinal Nematodes; CSF: Chaco Semiarid forests; PFG: Piedmont Forests and Grasslands; EPG: Eggs Per Gram; LWG: Live Weight Gain

Introduction

The study was conducted in G. Guemes (CSF) and San Martín (PFG) departments of Salta, province, regions that have a seasonal rainfall regime, with an annual mean of 450 and 900 mm and a dry period extending from May to November. In both agroecological regions between late March to December 2015 forty Brangus weaned female calves were divided into two groups: UTG, calves not receiving anthelmintic treatment and STG group, calves treated systematically with 200µg/kg moxidectin (MXD) every 45 days. STG treatment was used with the sole purpose of obtaining an optimal un parasitized group to compare the nematode effect. Management was based on grazing poor quality pastures of *Cenchrus ciliaris* (CSF) or *Brachiaria brizantha* (PFG). Every 45 days eggs per gram of faeces (epg) and faeces cultures were performed according to Suarez [5] and live weight gain (LWG) was recorded. Differences among groups were compared using analysis of variance and Tukey test.

Results

At the start of the study, mean epg (329±449 CSF and 595±480 PFG) values were moderate to high, therefore, for UTG, epg was high until the start of winter (907±754), whereas from July to the end of observations, UTG exhibited a gradual decrease in epg

(Figure 1). In STG, epg values were very low, indicating a good MXD activity. In UTG, the prevailing GIN genera recovered from faecal cultures in PFG were *Cooperia* (81.9%), and *Haemonchus* (15.5%) and in CSF *Haemonchus* (53.7%) and *Cooperia* (41.8%); few percentage of larvae of *Oesophagostomum* (2.3%) and *Trichostrongylus* (0.3%) were also recorded. In the STG, *Cooperia* was the only genus recovered.

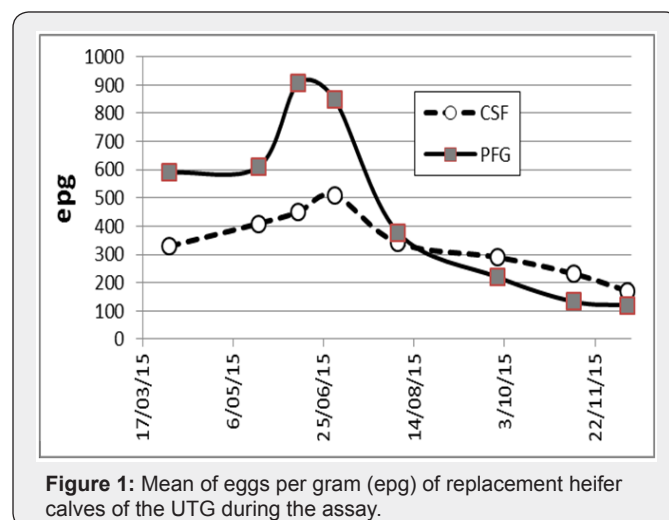


Figure 1: Mean of eggs per gram (epg) of replacement heifer calves of the UTG during the assay.

In both regions, calves did not show clinical signs of verminous gastroenteritis or any other sign of health problems in the herd. In PFG, at the start of the experiment, the treated group STG showed a significant differences ($p < 0.001$) in LWG after treatment with respect to UTG. Then, differences in LWG between groups continued to increase up to December, when total LWG showed significant differences ($p < 0.01$). In CSF, the treatment effect was evident from the winter, showing STG a significant ($p < 0.05$) higher LWG than UTG when the ranch increased the alimentary offer. At the end of the experiment, in both regions differences in LWG were significantly ($p < 0.005$) higher than in the UTG (Table 1).

Table 1: Initial weight and final weight recorded in December 2015 and live weight gain (LWG in kg) of calves between weight records. UTG: untreated group; STG group treated systematically with moxidectin. Regions: Chaco semiarid forests (CSF); Piedmont forests and grasslands (PFG).

Regions	Groups	18/3/15	18/3-1/12/15	1/12/2015
		Inicial weight	Final LWG	Final weight
PFG	UTG	158,2 a	52,0 a	210.2 a
	STG	158,0 a	77.8 b	235.1 b
CSF	UTG	110,8 a	22,6 a	133,4 a
	STG	112,5 a	31,9 b	144,4 a

Different letters indicate significant differences ($p < 0.05$)

Discussion

The results of parasitological analyses show that at the end of the summer-start of autumn, epg values depended on infection of early-weaned calves in midsummer and were favored by the coincidence of weaning and stress due to ingestion of pastures in small paddocks and summer rains. In contrast to what was reported for the semiarid Pampas region, *Cooperia* and *Haemonchus* were the prevalent species in this work. Then, by mid-winter, the dry period and the scarce rains would minimize larva availability in plots, which is reflected in the decrease of epg towards spring [8]. In addition, a strengthened immunity

of one-year-old calves would contribute to a reduction in GIN ovi position. Until mid-winter, significant LWG differences were recorded as a response to treatments, which was evidenced in the decrease of epg. Similar responses of LWG to treatments were reported in the central region of Argentina, which were attributed to the effect of mixed parasite infections due to *Ostertagia Trichostrongylus*, *Cooperia* and *Haemonchus* [5]. However, the responses obtained in this work were due to an infection caused almost exclusively by *Cooperia* and to a lesser degree *Haemonchus*. Differences in LWG among groups in response to treatments showed the effect of GIN subclinical infections on growing beef cattle in the NOA region and indicate the need to further study control strategies that are suitable for different production systems.

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