*Ife Journal of Agriculture Vol. 10 Nos 1 & 2 1988*

# Performance of West African Dwarf Sheep on Panicum Maximum Pasture during Chronic Haemonchosis

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## Abstract

Twenty four lambs were placed on a 1.6 hectares of *B. maximum* pasture. The pasture was divided into four 0.4 hectare paddocks on each of which 6 lambs were maintained. Two groups of lambs were infected with 2000$L_3$ *H. contortus* while the other two groups were not infected. One group each from infected and non-infected groups was placed on protein suppliment of *Leucaena leucocephala* leaves at 50g/d for twelve weeks.

It was found that the daily weight gain of the non-infected supplemented group (146 ± 14g/d) was significantly higher $P < 0.05$ than the weight gains of the other groups, (108 ± 23g/d, 107 ± 20g/d). Protein supplementation reduced the faecal egg count and produced a "total self cure". The P.C.V. was not significantly affected ($P > 0.05$) either by the infection or protein supplementation as the values ranged between 30.1 and 31.3%.

## Introduction

Kuil (1970), Schillhorn van Veen (1973) and Ayeni *el al* (1982) have shown that, of the helminth infections in Nigerian sheep, the most prevalent and most pathogenic is haemonchosis caused by *Haemonchus contortus*. Ogunsusi (1978) reported the incidence of both acute and chronic forms of the disease. However most studies on sheep haemonchosis in Nigeria had been carried out on housed animals. The micro-environment provided on pasture differs from that found within enclosed animal pens. Environmental factors such as moisture content and temperature at ground level, oxygen and light may affect the course of the disease, and hence its effect on the animals. It is worth while to assess the effect of chronic haemonchosis on grazing sheep.

Evidence exists that plane of nutrition may affect the course of parasite infestation (Soulsby, 1968). This study is also designed to evaluate the effect of natural protein supplementation (high plane of nutrition) on the course and effect of chronic haemonchosis on sheep.

## Materials and Methods

(a) **Pasture:-** The experiment was carried out on a 1.6 Ha pasture planted to *Panicum maximum* Var. S112 that had not been grazed for two years prior to the experiment. The pasture was divided into 4 paddocks A, B, C, & D. of 0.4Ha each separated by barbed wire fences — with the two middle paddocks (B and C) separated by a double fence one metre apart. Pasture larval count was zero at the beginning of the trials.

(b) **Infection Materials:-** One diarrhoeic West African dwart goat was bought at the Ile-Ife goat market and slaughtered. The abomasum was ligated and severed. It was then split along the smaller curvature and the contents washed with physiological saline into a clean white-bottomed dish. Adult *Haemonchus contortus* worms were picked up with forceps

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into a screw-capped specimen bottle containing physiological saline. These worms were used to infect two worm-free WAD lambs per os. Faeces of these lambs were exained for worm eggs daily as from day 1 p.i. As from day 5 p.i., when faecal egg-output was high in these animals, faeces were bulk-collected from the lambs using faecal bags attached to harnesses. The faecal material was incubated in large brown screw covered bottles for 21 days at room temperature. Third stage larvae were then harvested from the culture using the Bearmann technique standardized at $80L_3$/ml and used immediately for infection of experimental animals by stomach tube.

**(c) Experimental animals**

24 WAD grower rams, aged about 6 months, were dewormed with Thibenzole (R) twice at fortnightly intervals indoors and fed concentrate at 1kg/day for four weeks. Faeces were examined twice weekly after the second deworming. The rams were then grouped into 4 of 6 animals each and allocated to the paddocks A, B, C and D. The animals were left in the paddocks for a period of 5 weeks for acclimatisation before infection. During this period there was no feed supplementation. Thereafter the animals were subjected to the following treatments.

Group A — no infection + 50g dry *Leucaena leucocephala* leaves per head per day.

Group B — no infection, no supplementation.

Group C — Each animal was infected with $2000L_3$ *H. contortus* (25 ml of larval suspension) by stomach tube + 50g dry Leucaena leaves/ram/day.

Group D — Infected as in Group C but without supplementation. Stalt-lick and water were given to the animals *ad-lib* in large plastic bowls.

To avoid pasture difference effect, group A exchanged paddocks with group B fortnightly whilst groups C and D did likewise.

**(d) Evaluation criteria**

The rams were weighed individually using a Salter's hanging balance incorporating a jute-bag at their being brought to pasture and thereafter at weekly intervals over a period of 21 weeks. Weighing was done between 8 a.m. and 9 a.m. on weighing days.

At the time of weighting, rectal faecal samples were collected from each animal and examined for worm eggs (e.p.g.) using the modified Mcmaster technique (George 1969).

Jugular blood was also collected from each animal using heparinized vacutainer tubes for parked-cell-volume (PCV) determination utilizing the Hawksley microhaematocrit centrifuge.

**Statistical analysis:—**

Weight gains, epg and PCV were subjected to statistical analysis using the analysis of variance (Steel and Torrie, 1960).

## Results and Discussion

**Body weight gain:** Average daily weight gains of the rams are shown in Table 1. Analysis of liveweight gains showed that supplementation significantly increased ($P < 0.05$) the weight gains of uninfected rams Groups A Vs Group B but that, in the presence of chronic *H. contortus* infection, the *Leucaena* had no effect (Groups B, C and D). Although the experiment was not replicated, the design of the experiment (with the animals exchanging paddocks fortnightly) would not allow any comparison of weight gains of group A with B and group C with group D to be confounded by pasture differences. Overall, the leucaena supplementation had no effect on live weight gains of infected animals. A possible explanation for this is that the availability of pasture throughout the trial period was unexpectedly high and therefore the leucaena formed a relatively small proportion of the feed intake. A notable feature of the experiment was the high rate of growth observed in animals feeding solely on *P. maximum* pasture even during the dry season when the trials were conducted. Growth rates were between 1½ — 2 times higher than when the animals were kept indoors and fed mainly on concentrates.

**Faecal egg count:** Fig. 1 shows the pattern of faecal egg count in the faeces of infected rams. Worm egg-output started at week 4 p.i. in both supplemented and non-supplemented rams. However, the non supplemented rams had a peak egg-output at week 10 whilst the supplemented group Peaked 1 week later. Thereafter egg out-put declined rapidly and between weeks 14 and 16 none of the rams in the supplemented group had eggs in the faeces. During this period, the non-supplemented group was shedding an average of 50. Thereafter e.p.g. rose in both groups however at a higher rate in the supplemented group than in the non-supplemented group. Although none of the rams was slaughtered at anytime for worm counts, one may assume that there was some degree of "self cure which was total in the supplemented group between weeks 14 and 16 p.i. during which a new patency might have occured. The fact that the second rise in egg-output was higher in the supplemented group is also indicative of the effect of the rapid loss of worms from an earlier infection (Ogunnusi 1978).

**PCV:** Throughout the trial, all the animals had PCVs which were within the normal range. However the PCV of the infected, non-supplemented group was consistently lower than that of any other group (Fig. 2). Clinical anaemia was not detected in any group. These findings agree with those of Ross and Armour (1960) and Ogunsusi (1978) who found no anaemia in sheep chronically infected with *H. contortus*. The rams involved in this trial were of the Haemoglobin type HbAA (Gray and Ayeni unpublished 1981). This may also account for the lack of notable symptoms of anaemia usually associated with *H. contortus* infection as such animals are resistant to *H. contortus* (Preston and Allonby 1979).

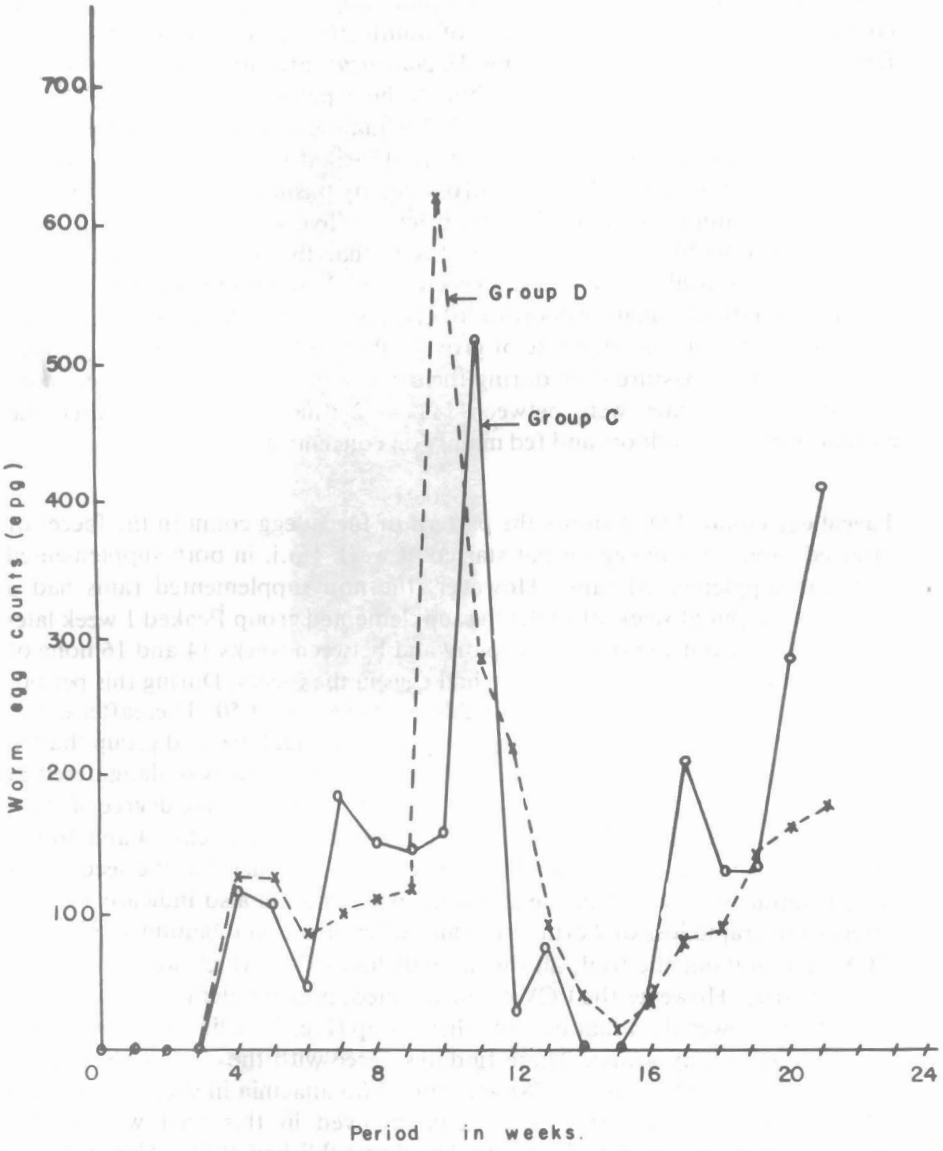


Fig.1: Faecal egg output of pastured WAD rams infected with *H. contortus* with (o) or without (●) Leucaena supplementation.

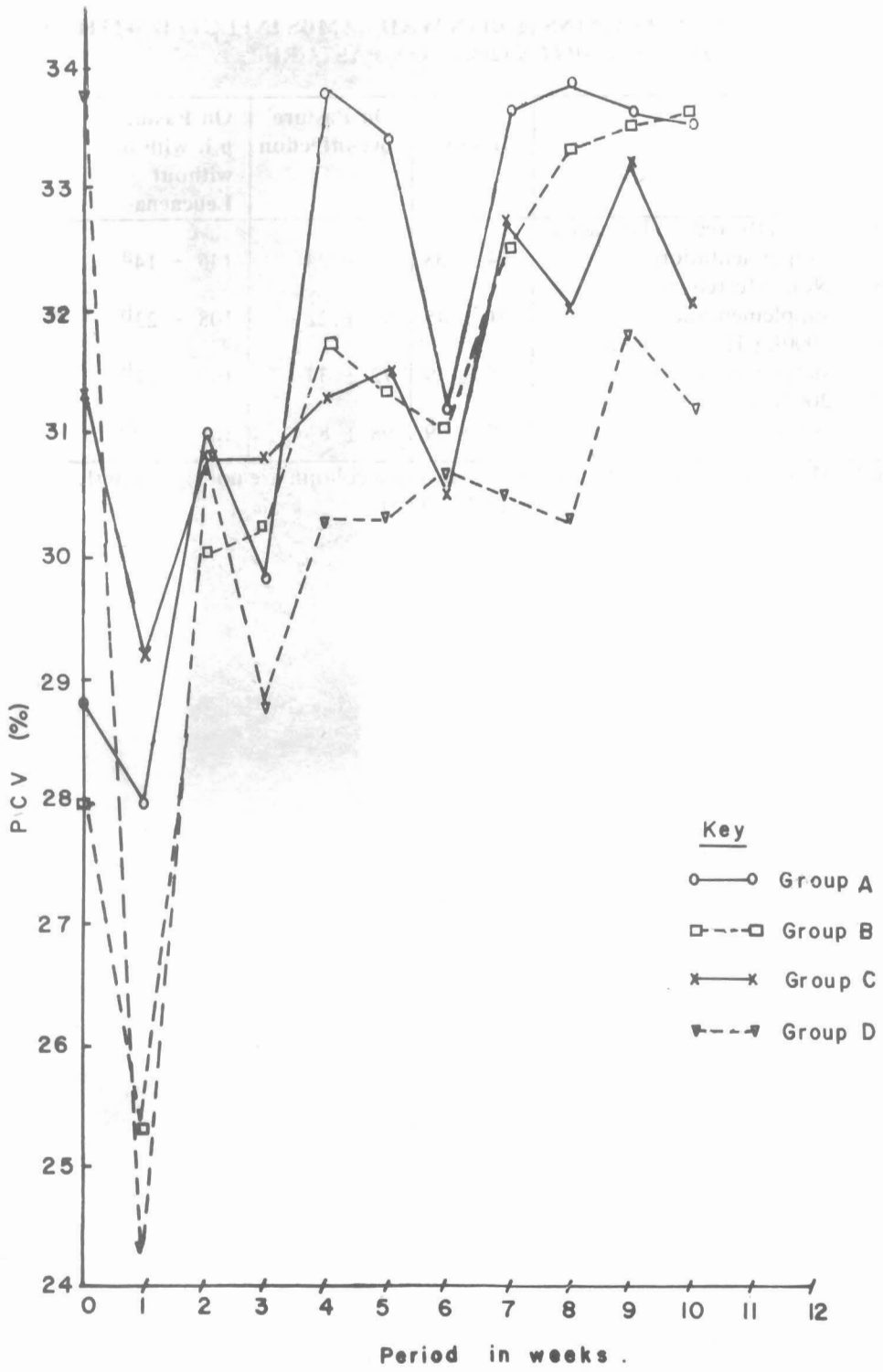


Fig. 2 : Post infection weekly PVC of each group of rams.

**Table 1: LIVE WEIGHT GAINS (g/d) IN WAD LAMBS INFECTED WITH *H. CONTORTUS* (2000L ON PASTURE)**

| | | Indoors | On Pasture pre-infection | On Pasture p.i. with or without Leucaena |
|---|---|---|---|---|
| A | Non-infected + Leucaena supplementation | 64 ± 38 | 95 ± 24 | 146 ± 14[a] |
| B | Non-infected, no supplementation | 51 ± 45 | 98 ± 22 | 108 ± 23[b] |
| C | 2000L$_3$ H.C. + Leucaena supplementation | 50 ± 19 | 72 ± 34 | 107 ± 27[b] |
| D | 2000L H.C., no supplementation | 49 ± 39 | 98 ± 8 | 105 ± 20[b] |

a, b: Means superscripted by the same letters in a column are not significantly different (P. 0.05).

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