

# THE EFFECTS OF BREED AND ENVIRONMENTAL FACTORS ON HELMINTH INFECTION OF SHEEP IN BAUCHI, NIGERIA.

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## SUMMARY

A study was conducted for one year, March, 1995 to February, 1996, to investigate the prevalence and seasonality of helminths in three breeds of sheep, Yankasa, Uda and Balami in Bauchi town. Eggs of Strongyles, Strongyloides and Moniezia were identified in the faecal samples. About 94.1% of the sheep examined were infected by one or more gastrointestinal helminths, while infection was not observed in 5.9% of the sheep examined. All factors considered namely, breed, sex, age of sheep and season had significant ( $P < 0.01$ ) effects on helminths infection. Yankasa was the most susceptible to infection while Balami was least. Females showed more susceptibility than males. The most burdened age group was 0-6 month followed by 7-12 month, 13-24 month while 24 month age group had the least helminths infection. Late rainy season had the highest helminths count followed by early dry season while late dry season had the least. More attention should therefore be paid to Yankasa, the 0-6 month age group, female sheep and late rainy season in helminths control.

**Keywords:** Helminths, Strongyles, Strongyloides, Moniezia

## INTRODUCTION

Sheep contribute an estimated 11% of the domestic meat supply of Nigeria (Otchere and Kallah 1990). Apart from contributing to valuable animal protein and occupation for millions of families, sheep also provide leather and other allied industrial raw materials. In spite of the contribution of sheep to the Nigerian economy, their productivity is low. Sheep production in Nigeria is hampered by inadequate supply of feeds, water, housing and ectoparasites control. Besides, helminths infection has generally been recognized as a major constraint to high productivity in small ruminants in Nigeria. The infection rates of helminths is aggravated by environmental factors such as climate, nutrition etc. The control of most of these environmental factors is expensive and beyond the reach of subsistent farmers who own most of the sheep. It would therefore be helpful if farmers could concentrate on rearing breeds that have relative advantage as regard helminths infection. As yet, however, it is not certain whether the helminths infection rates of the Nigerian sheep breeds, West African Dwarf (WAD), Yankasa, Uda and Balami are different.

This study was therefore designed to

- i. Examine the prevalence of helminths in sheep in the Bauchi area.
- ii. Identify any differential susceptibility of the sheep breeds to helminths infection.

- iii. Investigate the effects of some environmental factors on helminths infection.
- iv. Provide bench mark information for further studies into the reason for differential breed susceptibility should breed differences be observed.

## MATERIALS AND METHODS

Faecal samples for helminths determination and count were collected from sheep in one of the Bauchi Livestock Markets. Bauchi is on latitude 10°17'N, longitude 9°45'E and at an attitude of 690.2 meters above sea level. It has an average annual rainfall of 1091.4m. In general, the area can be described as a Savannah Woodland with a tropical climate.

*Type of sheep and management.* The sheep breeds available at the Bauchi livestock market were the Yankasa, Uda and Balami. These sheep were brought to the market from Bauchi town, the periurban areas of Bauchi and surrounding villages. The management system in Bauchi varied from free range grazing with little or no supplementation to tethering during the cropping season (April to November), while they were allowed to roam freely during the dry season. Even where intensive management has been attempted free grazing is encooperated during part of the day. Fresh faecal samples were collected at weekly intervals. The collections were done directly from the rectum using clean polythene bags. Egg determination and count were carried out using the usual modified McMaster Technique.

*Data analysis.* Four seasons were recognized; October to December, early dry season; January to March, late dry season; April to June, early rainy season and July to September, late rainy season. Four age groups were recognized, 0-6, 7-12, 13-24 and greater than 24 months. Chi-square tests (Little and Hills 1978) were carried out to determine the effects of breed, sex, age of sheep and season on helminths infection. Infection was also classified into single, double and triple infections corresponding to the presence of one, two or three species of helminths in the faeces.

## RESULTS AND DISCUSSION

Of the three hundred and six sheep examined; 81.4% were infected by helminths. The helminths identified were Strongyle, Strongyloides and Moniezia.

*Effect of breed of sheep on helminth infection.* Chi-square test ( $x^2 = 1.2$ ) showed non significant breed differences in the ratio of sheep infected to those not infected. The effect of breed on helminth burden in terms of egg count per gram (epg) of faeces also indicated significant ( $P < 0.001$ ) breed differences in helminth burden for all types of infection (Single, double and triple). Overall, Yankasa sheep were the most susceptible to helminth infection, followed by Uda while Balami was least.

Preston and Allonby (1979) had similarly found significant breed differences in susceptibility

Preston and Allonby (1979) had similarly found significant breed differences in susceptibility to helminth infection. They explained that the breed differences could probably be due to difference in acquired resistance to reinfection or because some breeds have better resistance than others.

*Effect of sex of sheep on helminth infection.* There was a significant ( $P < 0.01$ ) sex difference in the ratio of sheep infected to those not infected. Of the 167 males examined, 25% were not parasitised, while out of the 139 females examined 11% were not parasitised. In terms of egg burden (epg), there was a significant ( $P < 0.001$ ) sex differences in worm infection. Generally, female sheep were more burdened than males. Sex differences in helminth infection has been attributed to differences in sex hormones (Larry *et al* 1981).

*Effect of age of sheep on helminth infection.* Chi-square test ( $\chi^2 = 5.17$ ) showed non significant age differences in the ratio of sheep infected to those not infected. There were significant ( $P < 0.01$ ) age differences in helminth burden. The ranking of age groups in order of decreasing susceptibility were 0-6, 7-12, 13-24 and greater than 24 month age groups.

The probable explanation for the lower worm burden in sheep greater than 24 month of age compared to other age groups could be due to the so-called self-cure phenomenon (Assanji 1988) and/or high acquired immunity which increases with age. Thus a sheep may recover from helminth infection with increasing age and hence become resistant (Winkler 1982). He also stated that the low resistance to helminths in the 0-6 month age group could be due to low innate immunity in young sheep.

*Effect of season on helminth infection.* There were significant ( $P < 0.05$ ) seasonal differences in the ratio of sheep infected to those not infected. Of the 80 sheep examined during the early dry season, 16% were not parasitised. During the late dry season, on the other hand of the 71 sheep examined 22% were not parasitised. Similarly out of the 84 sheep examined during early rainy season, only 26% were not parasitised. However of the 71 sheep observed during the late rainy season, only 8% were not parasitised.

Significant ( $P < 0.01$ ) differences in helminth burden (epg) by season were also observed for all infection categories. Generally, helminth infection was highest during the late rainy season followed by early dry season, early rainy season, while late dry season had lowest.

The difference in helminth infection by season is probably due to climatic factors (Gibbs 1982). Temperature aids the hatchability of helminth eggs while moisture influences larval survival and migration to the pasture where they are easily ingested by the host (Soulsby 1982). The lower helminth infection in the dry than wet season is because dry conditions are generally not favourable for larvae development thus reducing the frequency of helminth infection.

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