

PREVALENCE OF GASTROINTESTINAL HELMINTHS AND WEIGHT CHANGES IN SEMI-INTENSIVELY MANAGED SAVANNA BROWN GOATS FED SUPPLEMENTAL MAIZE AND MINERAL SUPPLEMENT

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ABSTRACT

The study investigated the prevalence of gastrointestinal helminths and weight changes in semi-intensively managed savanna brown goats of different ages fed supplemental maize bran and mineral supplement in Karshi, Abuja. The experimental design was randomized complete block design (RCBD) using 3 treatments having 3 replicates. Eighteen (18) experimental animals weighing between 1.7 - 12kg and their ages ranging between 1-6 months, 7-12 months and 12 months and above were used. T₁ were without supplement, T₂ were supplemented with 1kg of maize bran daily for 12 weeks but without salt lick while T₃ were supplemented with 1 kg of maize bran daily and salt lick. The faecal samples were examined weekly using simple floatation and sedimentation techniques for the presence of helminths. The parasites isolated were *Ostertagia sp.*, *strongyloides sp.*, *Trichuris sp.* and *schistosoma sp.*, respectively. The animals fed supplemental diets (T₂ and T₃) had significantly (P<0.05) higher weight gain at weeks 8, 11 and 12 than T₁. It is recommended that public awareness programme be step up in the study area on the zoonotic importance of the parasites isolated and that livestock farmers be adequately sensitized to the effective use of maize bran and mineral supplementation during the dry season period when feed resources are very scarce.

Keywords: Prevalence, semi-intensive management, supplemental feeding and gastrointestinal helminths.

INTRODUCTION

The keeping of small ruminants is a common practice in most urban and semi-urban areas in Africa (Kanyari *et al.*, 2009). In Nigeria and West Africa, goats are reared traditionally at subsistence level. They are usually left to scavenge and cater for their own nourishment (Opera *et al.*, 2010).

However, with limited grazing spaces, urban farmers are forced with the challenge of effective management of these ruminant stocks. As a result of this, the animals are readily predisposed to some disease conditions which include helminthosis (Kagira and Kanyari, 2008). According to (Kagira and Kanyari, 2008), parasitic diseases constitute a major impediment to livestock production in sub-Saharan Africa owing to direct and indirect losses they cause.

Goats as small ruminants have some advantages over larger animals such as cattle, because of their lower purchase price, high fecundity and prolificacy, they have ability to survive on low quality diet in difficult conditions in spite of

these advantages, they are also prone to infection with gastrointestinal parasites (Anaeto, 2009). Studies across the country have shown that gastrointestinal parasites are widespread in Nigeria and that their effect limits livestock production. (Jatau *et al.*, 2011). Therefore, this study intends to assess the effect of supplementary feeding on parasitic infestations in goats raised semi-intensively.

MATERIALS AND METHODS

The study was carried out in Abuja Municipal Area Council (AMAC) livestock farm/clinic, Karshi, situated in Federal capital Territory (FCT) for a period of 12 weeks. The Federal Capital Territory lies within latitudes 9° 21'N and 9° 25'N of the equator and within longitudes 5° 45' E and 7° 39' E. The annual total rainfall is in the range of 1100mm to 1600mm (Yahaya *et al.*, 2014).

Source of experimental animals, management and design

The animals were sourced locally from different markets, Dei-dei and Karshi markets in Bwari

and Abuja Municipal Area Council of the FCT. Eighteen (18) Savanna Brown goats weighing between 1.7 – 12kg and their ages ranged between one month and one year were used in this experiment. They were divided into three age groups, 1- 6 months, 6 – 12 months and 12 months and above respectively. The experiment was arranged in Randomized Complete Block Design (RCBD).

Treatment one (T_1) were without any supplement, Treatment two (T_2) were supplemented daily with 1kg of maize bran without saltlick while treatment three (T_3) were supplemented with 1kg of maize bran and saltlick. The experimental animals were screened against ecto and endo- parasites using Terramycin long acting (TLA) at a dose rate of 2ml per 5kg of life bodyweight. Albendazole were administered orally at the doze rate of 1 mg/1kg body weight.

Determination of Gastrointestinal Parasites

Fresh samples of faecal samples were collected from the rectum of each animal weekly for a period of 12 weeks. Two procedures, floatation technique and sedimentation method as described by Khin – Khin (2007) and Thieupont (1979) were used in fecal analysis. The simple floatation technique was used to identify nematodes and cestodes while the sedimentation method was used to identify trematodes.

Determination of Weight Changes

The weight of each animal was determined weekly using the HANA mechanical scale. The weight changes in each animal were determined by subtracting the weight obtained in previous week from that of the preceding week.

Supplementary feeding

1000 grams of maize bran was given to each treatment per day, except treatment one (T_1) that was not given the supplement. The maize bran was purchased from milling centres within the study area and was properly sun dried to avoid bacteria and fungal growth. Commercially made mineral salt lick was used. The mineral components of the saltlick were: iron (Fe), calcium (Ca), Magnesium (Mg), phosphorous (P), sodium chloride (NaCl), manufactured by parcel Agro Tech Ltd, Nigeria. The proximate analysis of the maize bran used was carried out in the Animal Production Laboratory of school of Agriculture and Agricultural Technology, FUT, Minna.

Statistical Analysis

The data obtained on body weights were subjected to analysis of variance (ANOVA) using statistical Analysis system (SAS) 2008: version 9.2. Significance was determined at ($P<0.05$), Duncan's multiple Range Test was used to separate the means. Similarly, prevalence rates of infection for the isolated parasites were determined using descriptive percentages.

RESULTS AND DISCUSSION

The result of gastrointestinal helminths isolated based on age groups as presented in Table 1 revealed highest prevalence rate in two age groups showing 54.2% (less than 6 month) and 41.7% (12 months and above), with lowest prevalence rate of 26.4% obtained for 6 -12 months age group. The parasites isolated throughout the experimental period with varying degrees of prevalence across the various age groups were; *Ostertagia sp.*, *Strongyloides sp.*, *Trichuris sp* and *Schistosoma sp* respectively. Table 2 shows the weekly weight gain of experimental goats. The result shows that T_2 and T_3 had significantly ($P<0.05$) higher weight gain in week 8, 11 and 12 when compared to T_1 . However, T_3 has significantly ($P<0.05$) higher weight gain from week 8, 10, 11 and 12 when compared with T_2 within the same period. The drop in the weekly mean weight of the experimental animals without supplement agrees with the report of Hughes and Kelly (2006) that parasitic diseases inflict severe economic losses on the livestock industry and adversely affect the health, weight gain, feed conversion efficiency and reproduction of animals. *Strongyloides sp.*, *Trichiuris trichura* and *Schistosoma mansoni* isolated in this work are of public health importance because of the zoonotic nature of these parasites. World Health Organization (WHO) (2002) estimated that there are 1056 million persons infected with *T. trichiuria* globally. It has also been reported by the same organization that 200 million people in 76 countries are infected continuously or intermittently with schistosomiasis with about 200,000 persons dying annually from the disease. Similarly, all these parasites isolated have adverse effect on the health of livestock ruminants. The result also indicated that the youngest group of animals was the most infected as compared to the older ones. The result agrees

with the reports of Adama *et al.* (2012); Biu *et al.* (2009) that young animals and those with low immune status due to malnutrition and the effect of other diseases are more likely to be affected by gastrointestinal helminths.

CONCLUSION

Semi-intensively managed system of rearing, combined with supplementation using maize bran and minerals increased the animals resistance to infection, resulting in a low prevalence rate and increased weight gain. Also, parasites of public health significance namely: *Strongyloides sp.*, *Trichuris sp.* And *Schistosoma* species were isolated from the experimental animals. Similarly, relatively younger animals were more prone to infection than older animals. It is recommended that regular deworming programmes should be encouraged in the study area for animals and humans; this is because some of the parasites ova and larva identified in the study area are of zoonotic importance. Farmers should also be adequately sensitized to the effective supplementation of maize bran and salt lick during the dry season periods when feed resources are very scarce.

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Table 1 Prevalence rates (%) of gastrointestinal helminths in goats of different age groups raised semi-intensively and fed maize bran

Age Group	No. of Animals	Prevalence rate (%)	OS	Prevalence (%) St	Tr	Sc
1-6 Months	6	54.2	51.3	30.8	17.9	0
6-12 Months	6	26.4	52.6	0	42.1	5.3
Above 1 year	6	41.7	53.3	30.0	16.7	0
Os	<i>Ostetagia sp</i>	Group 1 1-6 months; St	<i>Strongyloides sp</i>	Group 2 6-12 months		
Tr	<i>Trichuris sp</i>	Group 3 above 1 year; Sc	<i>Schistosoma sp</i>			

Table 2 Weekly mean weight gain of goats fed maize bran and raised semi-intensively

Parameters	T ₁	T ₂	T ₃	SEM	LS
WK 1	6.0	4.3	6.2	0.9	NS
WK 2	6.4	4.7	7.0	1.0	NS
WK 3	7.3	6.7	8.0	1.2	NS
WK 4	6.6	6.8	9.6	1.5	NS
WK 5	6.7	8.0	7.8	1.5	NS
WK 6	6.3	8.8	9.2	2.1	NS
WK 7	8.6	10.5	10.3	1.9	NS
WK 8	5.8 ^b	10.2 ^b	12.5 ^a	1.4	*
WK 9	6.5 ^c	9.1 ^{ab}	10.1 ^{ab}	1.6	*
WK 10	7.1 ^c	10.1 ^b	10.2 ^a	1.4	*
WK 11	9.3 ^c	10.3 ^b	13.9 ^a	2.6	*
WK 12	4.6 ^c	9.5 ^b	13.9 ^a	1.9	*

abc = Mean denoted by different superscripts are significantly different (p<0.05)

KEY

SEM = Standard error of mean; LS = Level of significant; * = Significant; NS = Not significant

T₁ = Treatment 1 (Animals not given supplement but only grazing); T₂ = Treatment 2 (Animals fed maize bran only + grazing); T₃ = Treatment 3 (Animals fed maize bran + salt lick + grazing)