COMPARATIVE STUDY OF BODY WEIGHT OF SAVANNA BROWN GOATS OF DIFFERENT AGE GROUPS RAISED SEMI INTENSIVELY IN MINNA, NIGERIA

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ABSTRACT

Twelve weeks old experiment was conducted on the comparative study of the body weight gain of goats of different age groups raised semi –intensively. Fifteen savanna Brown goats of different age groups were randomly allocated to three treatments and replicated as treatment 1 (0-6months of age), treatment 2 (7months - 12 months of age) and treatment 3 (above one year of age) respectively. The animals were weighed weekly using mechanical weighing scale before they were allowed to go out for grazing in the morning. It was generally observed that significant differences ($p<0.05$) were maintained in the body weight of the three treatment groups, with T_3 (above one year of age) recording the higher body weight. The highest body weight gain differs significantly in different age groups of savanna Brown goats raised semi – intensively.

INTRODUTION

The importance of goats in the livelihood of rural African people can not be over emphasized. They play a pivotal role in rural economy as sources of employment, food and income generation (Aganga and Moganetsi, 1998). The total world population of goats in 2007 was estimated out about 850 million with a greater proportion of them found in low income food deficit countries (FAO, 2008). Goat production is a specialized business since its operation requires some skills like good feeding, proper health and housing management. A deviation from which may lead to a variety of problems such as disease outbreak, reduction in milk yield and poor skin production. The potential for improved small ruminant production in Nigeria appears high given wide distribution of abundant forage species of the tropics for utilization as food for optimum productivity by these small ruminants (IKhimioya, 2008). There in often a great need for herdsmen to know how much their animals weigh in order to make management decision on how much feed to give, when to breed, determination of dosages of various medications and Most importantly when to market either as weaned, growers or for slaughter (Otoikhian, 2008). It is in the light of the above that this study seeks to determine the body weight gain of savanna Brown goats of different age groups managed semi-intersively.

MATERIAL AND METHODS

Location of study area

This study was cairned out at the Research Farm of Federal University of Technology Minna, Gidan Kwano Campus in Bosso Local Government Area of Niger State, Nigeria which is located in the Southern Guinea Savanna Zone. The herd used consists of twenty five (25) savanna Brown goats which were properly identified with tags. Fifteen (15) animals were randomly selected and assigned into three (3) treatment groups. Group 1: young animals (kids aged 0-6 months) group 2: above 7 months -12 months of age and group 3: adult animals above a year. The experiment was conducted between the months of April - June, 2009. The three treatment groups were designated as T_1 T_2 and T_3 respectively.

Parameters measured

The body weight of the animals were taken weekly for a period of twelve (12) weeks (8.00 - 9.00a.m) using mechanical weighing scale before they were allowed to go out for grazing weekly on a natural range lands. Body weight gain were calculated by subtracting the first week body weight from the second week body weight from third week body weight till eleven week body weight from twelve week body weight for each treatment. All the data collected were subjected to Analysis of Variance (ANOVA) to determine whether there is significant difference between treatments under study. Further analysis was carried out using Duncan Multiple Range Test (DMRT) to separate the means for pair comparison between treatments.

RESULTS AND DISCUSSION

Results of body weight obtained are presented in Table 1.0 which indicates highly significant difference ($p<0.05$) in the weekly body weight

Table 1.0: Body weight of Savanna Brown goats at different age managed semi intensively

Week	T_1	T_2	T_3	L_S	SEM
Week 1	8.6±1.29^b	12.8±1.02^b	29.0±4.33^a	**	2.75
Week 2	8.8±0.97^b	13.6±0.87^b	28.4±4.66^a	**	2.68
Week 3	8.2±0.86^b	13.0±1.10^b	29.2±4.20^a	**	2.76
Week 4	9.0±0.86^b	13.7±1.27^b	29.3±4.30^a	**	2.71
Week 5	9.8±0.86^b	15.1±1.4^b	29.6±3.87^a	**	2.57
Week 6	11.0±0.71^b	16.0±1.10^b	30.3±3.74^a	**	2.50
Week 7	12.4±0.68^b	17.0±0.84^b	31.6±3.31^a	**	2.48
Week 8	13.2±0.58^b	17.2±0.97^b	32.6±3.31^a	**	2.37
Week 9	14.8±1.07^b	19.2±0.66^b	32.6±3.31^a	**	2.30
Week 10	14.2±0.73^b	18.4±1.50^b	33.0±3.56^a	**	2.47
Week 11	15.4±1.16^b	20.4±1.43^b	34.2±4.02^a	**	2.52
Week 12	14.2±0.73^b	19.4±1.6^b	33.2±3.43^a	**	2.45

Means followed with the same superscript indicated along the row are not significantly different (P>0.05)
T1 = 0 – 6 months T2 = 7 – 12 months T3 = 1 year and above ** = significant at 1%

among different age groups of savanna Brown goats managed semi- intersively. However, T_3 recorded the highest body weight. This is reflection of ages of the goats which varied out at onset of the experiment, older goats weighed more than the younger ones. A graphical illustration of the pattern of body weight gain in the three treatment groups are shown in fig. 1: In the first week of study, no weight was gained by animals in any of the three age groups, however, in the second week of study, a remarkable decline in weight was recorded in the older animals (above 1 year old). This rose sharply in the third week of study after which it declined. The patterns of weight gain among all the groups were very erratic. Nonetheless, a higher weight gain were recorded in T_1 (1.4) and T_2 (2.2) at 7th and 11th week respectively (fig. 1). Occasionally, weekly losses in weight as recorded in this study may be due to helminth infestation as confirmed in a similar study (Amoran, 2007) where helminthes load on the weekly faecal samples collected from difference age of goats were found eggs and larval stages of *Fasciola gigantica* and *Haemonchus contortus*. The retrogressive consequential effect of these parasitic worms in the system of goats could cause serious economic losses through reduction in weight gain as well as increased mortality (Hussein et al., 1983). Lack of strategic deworming programmes within the community might likely be the cause of this, as the experimental animals grazes freely and mix – up with other animals from the neighbourhood. The highest body weight gains among goats in T_1 and T_2 as illustrated in fig 1 confirmed earlier report (Hussein et al., 1983) that at less than a year, goats gain more weight and utilize feed more efficiently than older animals, improved nutritional condition may also increase weight gains of goats. Similarly, Carles (1985), confirmed that if nutrition is improved upon at 4 to 6 months of age, there will be strong interaction with parasitic burden, as such, this could be taken to account for the occasional loss of weight in goats in (0 – 6 months) and even subsequent abnormal pattern of growth in the goats. It could be concluded that goats in T_1 and T_2 shows remarkable increase in weight gain even though they were managed semi-intensively. Those in T_3, being older recorded the least value for body weight gain.

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COMPARATIVE STUDY OF BODY WEIGHT GAIN IN SHEEP OF DIFFERENT AGE GROUPS RAISED SEMI-INTENSIVELY IN MINNA, NIGERIA

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ABSTRACT
A twelve week old experiment was conducted on the comparative study of body weight gain in sheep of different age groups raised semi-intensively. Twelve sheep of different age groups were allocated to three treatments of four replicates: treatment one (0 – 6 months), treatment two (1 – 2 years) and treatment three (2 years above) respectively. The animals were weighed weekly using mechanical weighing scale before they were allowed to go out for grazing in the morning. There were highly significant differences in body weight gains at 5% ($p<0.05$) and 1% ($p<0.01$) levels respectively between the three treatment groups. The level of variability in standard error of means is higher in treatment two (T_2). It was concluded that body weight gain differs significantly in different age groups of sheep raised semi-intensively.

INTRODUCTION
Production of sheep is a specialized business since its operations require some management skills like good feeding, proper health and grazing management, a deviation from such skills (managements) may lead to variety of problems such as disease outbreak, parasitic infestation, reduction in weight gain, reduction in milk yield and poor skin production (Adegbola, 2002).

The potentials for improved small ruminant production in Niger State appears very high given wide distribution of forage species for utilization as food and availability of abundant water bodies for optimum productivity by these small ruminants (Adama, 2008).

Growth, usually defined as increase in size or body weight at a given age is one of the important selection criteria for the improvement of small ruminants such as sheep. The indigenous bread of sheep mainly kept for meat in Nigeria, Yankasa sheep is the most numerous and most widely distributed throughout the various ecological zones particularly Guinea and Sudan savanna vegetation belts (Afolayan, 1996).

There is often a great need for livestock herdsmen to know how much their animals weigh in order to make some management decisions on how much feed to give, when to breed, determination of dosages of various medications and most importantly when to market either as a weaner, growers or for slaughter (Sigh et al, 2004). It is in the light of all these, that this study seeks to determine the body weight gain in sheep of different age groups raised semi-intensively which could provide a reference baseline data that could be of benefit to the livestock farmers within the immediate environment.

MATERIAL AND METHODS
Location of study area
This study was carried out at the Research Farm of Federal University of Technology, Minna, Gidan-Kwano campus in Bosso Local Government Area of Niger State which is located in the Southern Guinea savanna zone. Minna has a land mass of 28.5km square and lies between longitude 6° 29'E and latitude 9° 31'N. The average temperature ranges over the period is 27 – 39°C with an average monthly rainfall of 1200mm (students hand book, 2008).

Experimental animals and management
Twelve (12) heads of sheep were used for this study. They were randomly selected from a total of 26 heads of sheep in the farm. The experiment was conducted between the months of April – June, 2009. Each animal was properly identified with a tag. They were randomly assigned into three treatment groups of four replicates per group respectively. The groups comprised of young animals i.e. lambs of 0 – 6 months (T_1), adults of 1 -2 years of age (T_2) and those above 2 years of age (T_3) respectively. They were designated T_1, T_2 and T_3 and managed semi-intensively.

Body weight gain measurement
The body weight was taken for a period of twelve (12) weeks using mechanical weighing scale before they are allowed to go out for grazing between 8:00am to 9:00am. Four animals were weighed per

treatment group in a week which translates to a total of 144 readings throughout the study period.
The data obtained were preliminarily analyzed using analysis of variance (SPSS, 2005). A further analysis was carried out to separate the means using Ducan multiple range test (DMRT, 1955).

Table 1: Body weight gain in sheep of different age groups raised semi-intensively

Weekly weight gain	0-6	1-2 years	2 years above	LS	SEM
Week 1	11.125 ± 1.297^{c}	$24.250+2.175^{b}$	37.50 ± 1.041^{a}	**	3.35
Week 2	11.50 ± 1.04^{c}	24.00 ± 1.78^{b}	36.75 ± 1.31^{a}	**	3.19
Week 3	11.63 ± 0.99^{c}	23.75 ± 1.70^{b}	36.25 ± 1.03^{a}	**	3.10
Week 4	12.00 ± 1.137^{c}	24.25 ± 1.75^{b}	36.125 ± 1.087^{a}	**	3.053
Week 5	11.63 ± 1.14^{c}	24.13 ± 1.59^{b}	36.00 ± 1.15^{a}	**	3.08
Week 6	12.00 ± 1.22^{c}	24.88 ± 1.59^{b}	37.50 ± 1.19^{a}	**	3.22
Week 7	14.13 ± 1.66^{i}	25.00 ± 1.58^{b}	37.75 ± 1.03^{a}	**	3.01
Week 8	12.75 ± 1.23^{c}	25.13 ± 1.85^{b}	37.38 ± 0.94^{a}	**	3.12
Week 9	13.25 ± 1.16^{c}	27.38 ± 1.78^{b}	37.75 ± 1.03^{a}	**	3.11
Week 10	14.00 ± 0.98^{c}	26.75 ± 2.15^{b}	38.50 ± 1.02^{a}	**	3.12
Week 11	14.25 ± 1.051^{c}	26.63 ± 2.14^{b}	38.13 ± 0.88^{a}	**	3.04
Week 12	14.13 ± 0.97^{c}	26.75 ± 2.37^{b}	$38.75+0.609^{a}$	**	3.13

* Level of significance at 5% ($p<0.05$) level
** Significant at 1% ($p<0.01$) level
Means followed by same letters indicated in rows are not significantly different at 5%.

RESULTS AND DISCUSSION

The preliminary analysis was carried out using analysis of variance indicated that there is highly significant difference between the group means even at 5 and 1% respectively. A further analysis was carried out to separate the means using DMRT and the ranks of the means are indicated in superscripts following the means. The "a" rank indicated that body weight gain is higher in treatment three (T_3) followed by treatment two (T_2) and treatment one (T_1) respectively.
Throughout the experimental period (12 weeks), the trend in body weight gain followed the same pattern, showing weight gain to be more pronounced in treatment three (T_3) while treatment one (T_1) recorded the lowest weight gain. In all, body weight gain was significantly different among the three treatment groups. The level of variability of the standard error of means (SEM) was highest in treatment two (T_2).
The significant differences in body weight gains observed in the three treatment groups is worthy of note. This is because the three groups involved animals of different ages whose feed intake, nutrient requirements, nutrient digestibility and utilization differs (Richard et al, 1999; Coffey et al, 2004). Similarly, feed intake and requirements at adult age in small ruminants is higher, this is because adequate nutrition is required for growth and reproductive functions such as improved conception rates which may translate into young birth weights (Alexander, 1984; Mukasa, 1994). At adult age in small ruminants, the body physiology performs at optimal level which allows for optimum feed in take and nutrient digestibility as a result of a well developed gastrointestinal tract particularly rumen.
The weight gains observed at the early part of the experiment (April - May), were much lower than in the later past of the study. This confirms the findings of (Leng, 1990; Bayracktar, 2003) that the period being a dry season, it is possible that a low protein: energy ratio obtained from the feeds, pastures and crop residues at this period translates into high heat increament in the rumen and high metabolic heat production in the body, which at times interacts with the climate to produce heat stress which inturn reduces feed intake.
Environmental factors of rainfall and available pasture as well as regular deworming against helminth worms might have influenced the appreciable body weight gains obtained in the later past of the study. The grazing land around the experimentally farm where the animals were kept is under restriction to entry and grazing by livestocks from the neighbouring communities. As such, experimental animals had opportunity to graze

optimally on the available pastures in the grazing land.

Variability observed in the standard error of means (SEM) observed in treatment two (T_2) maybe due to the fact that animals in this group are transiting from young age to the age of puberty. As such, high level nutrition is needed for their body growth and reproduction at this age (Parr et al, 1986).

In conclusion, the result of this study showed that body weight gain in sheep kept semi-intensively differs significantly with age and seasons of the year.

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