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Herd composition and productivity indices of ruminant animals in Teaching and Research Farm, Federal University of Kashere Gombe, Gombe State

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Target Audience: *Policy makers, Ruminant farmers, Livestock officers*

Abstract

The research was conducted at the ruminant section of Animal Science Teaching and Research Farm Federal University of Kashere. The variables of interest and data collected were weaning weight, parturition interval, and litter number at birth. Others are weight at birth, mortality rate, survival rate, attrition percentages and productivity index. The data collected was analyzed using derived models by Wilson and Mason (1983) as presented. The results indicated that weaning weight for the cattle is 80.5±2.5, for the sheep 15.0±2.0, for the goat 14.7±2.0 Parturition interval for the cattle 260±11, sheep 150±9, for the goat 150±8. Litter number at birth for cattle 1, sheep and goat 1.61 and 1.81. Weight at birth was 420.5in cattle ±2.0, sheep and goat 45.5±2.0 and 43.5±2.0. Number of Parturition in cattle was 4.5, 7.3 in sheep and 9.5 in goats3 and 9.5. Mortality rate in cattle 0.2, sheep 0.25 and goat 0.29%. Estimated Individual flock weight in cattle was 332, sheep 40.5 and goat 38.8. Initial flock size was 32 for cattle, sheep 35 and goat 34. Final flock size in Numbers was cattle 27, sheep 26 and goat 28. Flock exits were cattle 7, sheep 9 and goat 7. Attrition percentages for cattle were 15.6, sheep 25.7 and 20.6. The study concluded that that the productivity parameters of cattle sheep and goats in teaching and research farm Federal University of Kashere were better in Cattle and Goats. Attempt should be made in improving their performance by keeping proper productivity records.

Key Words: *Herd Composition, Productivity Indices, Ruminant Animals*

Description of Problem

Animal Productivity is one parameter frequently used to express the potential performance of a particular production system. Herd composition and productivity indices of cattle, sheep and goat of ruminant animal are very important resource information that plays a predominant role in the sustenance of the live hoods of impoverished families especially in the rural area of tropical countries (1; 2 and 3). Nigeria has population of estimated of 34.5million goats, 22.1million sheep and 13.9million cattle. According to (4) and (5), the larger proportion of these animals' population are however largely concentrated in the northern region of the country. Specifically, about 90 percent of the country's cattle population and 70 percent of the sheep and goat populations are concentrated in northern region of the country which is likely to have been influenced by the ecological condition of the region that is characterized by low rainfall duration, lighter sandy soils and longer dry season. Among the livestock that makes up the farm animals in Nigeria, cattle, sheep and goats constitute the farm animals largely reared by farm families in the country's Agricultural system. A study by (6; 7 and 8) showed that in the humid zone of northern

Nigeria, 37% of the households kept goats and 8% sheep, the average flock sizes being 5.2 goats and 6.5 sheep. According to (8), the comparative figures in the southern part of the country were 27% (goats) and 23% (sheep), with average flock sizes of 4.4 (goats) and 4.9 (sheep). Factors affecting variation in productivity rate, response to nutrition and or heredity are clearly stated such as age and condition of ewe, but the influences of other factors such as parturition interval, weaning weight and are not clearly understood, in as much as season of year has a marked effect on performance rate. Whatever their level of production, livestock in developing countries provide millions of families with better nutrition, family income and employment opportunities, draft power and a more balanced agriculture.

According to (9, 10), the productivity data of ruminants' animal in the semi- arid zone can be cross-analyzed through breed degree of mobility and farming system. The problems affecting ruminant's animal in semi -arid environment like Nigeria includes inadequate basic performance data and record keeping (11). Other challenges are seasonally related issues, low level of nutrition, and high level of pre-weaning mortality resulting from parasite and infectious disease and bad managements of economy. These constraints are interactive and are often aggravated in traditional husbandry systems by lack of flock management. The knowledge on genetic capacity of most of the indigenous breed is further limiting factors, but an improved performance potential arising from selection or cross breeding the best productive indices, good nutrition and flock management remain a viable tool for general herd improvement. The productivity of most ruminants' species is not documented therefore breeding programmers and other intervention packages with respect to production and performances is lacking. It is important to note that sheep and goat population is increasing much faster in developing countries than in developed ones. This may be explained by the ability of ruminant to survived and produce in poor environment on low - cost feeds, their particular adoptability to arid conditions and their suitability for the small capital scarce family farms in developing countries. The objective of the study is to analyze the productivity indices of the indigenous breeds of ruminants in the teaching and research farm of Federal University of Kashere,

Materials and Method

The research was conducted at Animal Science Teaching and Research Farm Federal University of Kashere which is situated about 70 kilometers away from Gombe, the capital of Gombe State. The ruminant livestock population in the farm comprising of cattle, sheep and goats are the experimental animals for the study. Separate recording data sheets were used to enter information on cattle, sheep and goats production parameters in the farm from the records available. Verbal interviews with the farm attendants and their supervisor were also conducted to obtain basic information about the productivity parameters of the animals. The variables of interest and data collected include weaning weight, parturition interval, litter number etc.

The data collected was Analyzed using derived models by (12) as presented below:

1. Live Weight per Parturition (Y) = $\frac{LWW}{SPI} \times 365$ *Where Y = Live weight per parturition,, LWW= Litter*

LWW= Litter live weight at weaning; SPI = Subsequent parturitioninterval

2. Recruitment ration = $\frac{Es + Esl + Esi + Cni}{}$ *Where Es = Exit from Sales, Esl= Exits from Slaughter*

IFs

Esi= Exit from Social interaction, Cni =Change in Net Inventory; IFs=Initial flock size

3. Productivity Index = $\frac{365\ (N-1) \times ALs \times AS \times AW}{Ta - Ti}$ *Where N = Number of Paturation,*

ALs= Average litter Size at birth; AS= Average Suvival rate until weaning, AW=Average weaning weight, Ta =Age at present parturition, Ti =Age at first parturation

4. Mortality rate = Number of dead animals / Live Animals X 100.
5. Survival rate = (Percentage number of (infected) survived animals recorded compared to live and healthy animals).

Other parameters measured includes Weight at birth (kg), Number of Parturition, Estimated Individual flock weight (kg), Initial flock size in Numbers, Final flock size in Numbers, Change in Inventory and Flock exits in Numbers (Sales, Death etc), Survival rate until weaning and Attrition percentage.

Table 1: Cattle goats and sheep population / average ages in teaching and research farm Federal University of Kashere

						Calves		
Cattle Breed	Cows	Bulls	Dry	Lactating	Heifers	Males	Female	Total
Whites Fulani, Age (Years)	2 (3.5)	5 (3.8)	3 (3.2)	4 (3.6)	4 (2)	2 (0.6)	2 (0.83)	22
SokotoGudali, Age (Years)	0	0	2 (3)	0	0	0	0	2
Red Bororo, Age (Years)	1 (4)	0	2 (3.5)	0	0	0	0	3
Total	3	5	7	4	4	2	2	27
						Kids		
Goats Breeds	Does	Bucks	Dry	Lactating	Young	Males	Female	Total
Maradi , Age (Years)	5 (3.3)	1 (3)	0	3 (3.2)	1 (2)	2 (0.4)	1 (0.25)	13
Red Sokoto , Age (Years)	2 (2.7)	4 (3.5)	0	2 (2.5)	0	1 (0.45)	1 (0.4)	10
Sahel , Age (Years)	0	1 (3)	0	0	0	0	0	1
Boar , Age (Years)	0	2 (3.3)	0	0	0	0	0	2
Total	7	8,00	0	5	1	3	2	26
						Lambs		
Sheep Breeds	Ewes	Rams	Dry	Lactating	Young	Males	Female	Total
Yankasa, Age (Years)	0	2 (3.3)	0	1 (2.5)	1 (2)	0	1 (0.33)	5
Uda, Age (Years)	2 (3.7)	4 (2.9)	3 (2.3)	4 (3.5)	4 (2.8)	2 (0.42)	1 (0.33)	20
Balami, Age (Years)	0	0	0	1 (3)	1 (1)	0	1 (0.25)	3
Total	2	6	3	6	6	2	3	28

Results and Discussion

Table 1 shows Cattle breed composition, population and average ages in Teaching and Research Farm Federal University of Kashere. In general, there were twenty-seven cattle separated into three breeds, namely white Fulani, Sokoto Gudali and Red Bororo breeds. Among the breeds, White Fulani was twenty two representing 81.5% of the total herd composition. There were two Sokoto Gudali dry cows without heifers or calves. Similarly Red Bororo breeds had only four years aged cow and two dry cows with an average age of 3.5 years. This result suggests that the future expansion of the herd depend on the productivity parameters of white Fulani cattle which are composed of heifers and both male and female calves as suggested by 11 and 13. The table shows that dry cows were seven,

bulls five while milking cows and heifers were four each.

Table 2 shows Goat's population and average ages. There were twenty-six goats in the farm. Maradi breed aged two to three year were the predominant breed in the herd representing 50% of the total herd composition. There were five does, one buck, three milking does with two male and one female kid respectively. The Red Sokoto breed were ten comprising of two does, four 4 bucks and two milking does with one male and one female kids. The Sahelian and the Boar breeds have only one and two bucks respectively.

Generally, the number of bucks in the goat herd is eight representing (30.77 %.) This implies that the ration of male to female is higher and may be a factor for lower kids in the herd as a result of competition during service or mating and subsequent fertilization. There were twenty-eight sheep comprising of Yankasa five, Uda Twenty and Balami three breeds. The Sheep herd is composed mainly of Uda breeds accounting about (71.4 %) of the total sheep population.

Table 2: Means of Parameters Composing the Productivity Indices of Cattle Sheep and Goats at F.U.K Teaching and Research Farm (± s.e.) of flock average

S/N	Parameter	Cattle	Sheep	Goat
1	Age at first parturition (years)	3.5	1	1
2	Age at present parturition (years)	4	2.2	2,1
3	Weaning weight of Litter (Kg)*	80.5±2.5	15.0±2.0	14.7±2.0
4	Parturition interval (days)	260±11	150±9	150±8
5	Litter number at birth	1	1.61	1.81
6	Mortality rate	0.2	0.25	0.29
7	Weight at birth (kg)	420.5±2.0	45.5±2.0	43.5±2.0
8	Number of Parturition	4.5	7.3	9.5
9	Est. Individual flock weight (kg)	332	40.5	38.8
10	Initial flock size in Numbers	32	35	34
11	Final flock size in Numbers	27	26	27
12	Change in Inventory	5	9	7
13	Flock exits in Numbers (Sales, Death etc)	7	10	11
14	Survival rate until weaning	0.8	0.75	0.71
15	Attrition percentage	15.6	25.7	20.6
17	Live Weight per Parturition	113.0	36.5	35.7
18	Recruitment ratio	0.38	0.54	0.52
19	Productivity Index	64.5	39.06	53.28

*(at 24, 13 and 13 weeks of age for Cattle, Sheep and Goats respectively)

The result in Table 2 shows the productivity indices of the animals Cattle Sheep and Goats in the teaching and research farm of Federal University of Kashere. The Age at first parturition (years) shows that the average value for both cattle breeds was three and half years and one year for both sheep and goats. However, the age at present parturition was four years for cattle while there was a difference of 0.1 in sheep and goat. The weaning weight of Litter (Kg) indicated that calves were weaned at the average weight of (80.5±2.5 kg) while sheep and goats are weaned at the weight of (15.0±2.0 kg) and (14.7±2.0 kg) respectively.

Productivity indices of ruminant's animals were highlighted by (14; 15 and 16).

Parturition interval (days) show similar values in sheep and goats of 150 days while in cattle's it was about a year (260) days. Litter number at birth indicated that cattle produces single calves while twining occurs in sheep and goats with an average figure of (1.61) and (1.81) litters respectively. Mortality rate was higher in goats (29.0%) followed by sheep (25%) and (20.0>in cattles).

Conclusion and Applications

1. The study concluded that that the productivity parameters of cattle sheep and goats were better in cattle and goats, hence, attempts should be made in improving their production.
2. With good information about the animal's genetics, better selection decisions can be made to improve herd performance.
3. Records of production parameters should be properly kept for future uses by researchers and or individual farmers.

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