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Research Article

EFFECT OF EXTENSIVE SYSTEM OF MANAGEMENT ONTHE GROWTH PERFORMANCE OF RAM LAMB AND EWE LAMB IN SEMI - ARID ENVIRONMENT OF NIGERIA

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Free Range System of Management, Ram lamb (young male sheep), Ewe lamb (Female Young Sheep), Growth performance, Rump Tail, Vertebral Rump Tail, Girth Circumference, Head Length, Height at Withers

ABSTRACT

This research was carried out at the Department of Animal Science and Range Management Teaching and Research Farm, Modibbo Adama University of Technology, Yola, Adamawa State, to evaluate the growth performance of ram lamb and ewe lamb raised under natural grazing .The research was conducted by using four ramlambs and four ewelambs which lasted for three months (12 weeks). The data collected was subjected to Mann Whitney test such as Head Length (HL), Vertebral Rump Length (VRL), rump tail (RT), Height at withers (HW) and Girth Circumference (GC).The Mann Whitney testis the non-parametric analogue of the parametric unpaired test, as in non-parametric test, the actual measurement were not employed or used, instead the ratio of measurement were used. The values of the total Head Length (HL) were taken from week one to week twelve (12) and added together and divided by the total number of weeks (12 weeks) and finally obtained the average or mean value of the Head Length (HL), same procedure was followed for the vertebral rump length (VRL), rump tail (RT), height at withers (HT)and girth circumference (GC). The result obtained showed that ram lamb performed better than the ewe lamb under free range system of production. Thus, based on the experimental research, male put more weight compared with female counter part. Generally, it is very difficult to determine the growth performance of ram lamb andewe lamb, raised under natural grazing or production. However, this research find out the effect of extensive system of management on the growth performance of ram lamb and ewe lamb

INTRODUCTION

Small ruminants are one of the major sources of food and played an important role in social and economic aspects in developing countries. F.A.O, (2004) indicated that animal feeds have become an increasingly critical component of the integrated food supply chain, also sheep and goats have a lot of promise for increasing meat production, milk, wool and small holder's income due to their small size, low individual cost and the ability to adapt and survive in harsh environment. It is estimated that 50 percent of the world's sheep and goats population are found in the developing countries and efficient managements of ruminants in the country must therefore, pay attention to the types and quality of forage available and supplementation required to provide adequate feeds for the production of livestock Jockthan *et al*. (2013). Before feeding, lambs may either be self-fed or hand fed milk replacer (Awogbude, 1985). Self-feeding requiresless laborand allowsthe lambs to suckle as desiredand to set its own level of consumption, self-feedingalso help to prevent digestive upset (Tijjani, 1984 and Awogbude, 1985). However, extended period without feed may cause lambs to lose their desire to suckle (Bayer, 1986 and Tarfa, 1985). Lambsdon't have a functional rumen, when lambs drink milk; the rumen and

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reticulum are generally by passed. Suckling causes a reflex action bringing the walls of the reticulum together to form an esophageal groove leading directly to the omasum. This reflex is very important in newborn lambs, to ensure that antibodies in the colostrum are transported intact to the abomasum. The esophageal groove generally does not form when lambs are fed milk by a stomach tube. Without the reflex, the milk will end up in the reticulum and may cause bloating, as the milk will be poorly digested. During the first few weeks of a lamb's life, the rumen is very small and has no microbes. The rumen will become functional as the lamb begins to consume more plant material and the rumen is 'seeded' with microbes. Lambs are morelikely to start feeding on feed that is coarsely ground rather than plated (Njwe, 1992). However, high quality commercial feeds is acceptable and work well; at the beginning they consumed small amounts of dry feeds (Sumberg, 1985). Therefore, it is important that, Lamb must have early access to feed if they are to weaned at 20 to 28 days of age (Ogunsusi, 1985). The feeder should be constructed, so that lambs cannot stand, lay or play in the feed as described by (Lakpini, 2002).

MATERIALS AND METHODS

The study was conducted at the Department of Animal Science and Range Management Teaching and Research Farm Modibbo Adama University of Technology, Yola, Adamawa State, Nigeria. It is located in the northern guinea savannah of Nigeria and lies between latitude 9^{O} and 14^{O}N and longitude12^{O}, 38^{o}E at altitude of 58.5m above sea level (Adebayor, 1999). Rainy Season begin in April and ends in October with a mean annual rainfall of 750 - 1050mm. The ambient temperature ranges from 18-40^{O}C (Akosim *et al*, 1999). The relative humidityranges from 20-80% with extreme low at 20-30% in January - March and start increasing from April and reached a peak in August and September (Adebayor, 1999).

Data Collection Techniques

Dentition

Appearance of teeth from both males and females was observed on weekly basis. It was carried out by opening the mouth of each of the animals in order to see the appearance of teeth's. Temporary (deciduous) are replaced by permanent incisors at more or less regular time intervals and usually three numbers of permanent incisors gives a fair estimate of age of the animals up to about 4 years.

Material used

The following are material and equipment used during data collection.

1. Weighing scale (5kg)
2. Measuring tape
3. Empty sack
4. Recording book/sheet
5. Ink (pen)

Live weigh gain (kg)

The experimental animals were weight for growth changes on weekly basis, the measurement taken include Crump Length (CL), Height at Wither (HW), Head Length (HL), Rump Length (RL), and Girth Circumstance (GC).

Statistical Analysis

The data collected from the experiment were subjected to the Mann Whitney test, the Mann Whitney Test is the non-parametric analogue of the parametric unpaired test, in non-parametric test, the actual measurement were not employed instead the ratio of the measurement were used.
The Mann Whitney Statistics

$$U = n_1n_2 + n_1(n_1 + n_2) - \frac{R_1}{2}$$

Where,

n_1 = Total number of observation in group 1
n_2 = Total number of observation in group 2
R_1 = Sum of ratio of group 1
R_2 = sum of ratio of group

RESULT

Table 1 Showed the Head Length of Ram Lamb and Ewe Lamb No. Of weeks RL (Ram Lamb) EL (Ewe Lamb) Ratio (RL) Ratio (EL)

No. of weeks	RL (Ram Lamb)	EL (Ewe Lamb)	Ratio (RL)	Ratio (EL)
1.	**28.5**	**16.3**	**2.4**	**1.4**
2.	30.4	18.9	2.5	1.6
3.	34.1	20.7	2.8	1.7
4.	36.9	22.6	3.1	1.8
5.	38.2	24.8	3.2	2.1
6	40.0	26.5	3.3	2.2
7.	40.7	28.2	3.4	2.4
8.	42.2	30.7	3.5	2.6
9.	44.6	32.5	3.7	2.7
10.	46.5	34.7	3.8	2.9
11.	48.9	36.8	4.1	3.1
12	50.6	40.2	4.2	3.4
	$n_1 = 12$	$n_1 = 12$	$R_1 = 40$	$R_2 = 27.9$

Where
n_1 = Total number of observation in group 1
$n_{2\,\text{Total}}$ number of observation in group 2
R_1 = Sum of ratio of group 1
R_2 = Sum of ratio of group 2

Head lengths (HL) are presented in table 1. The result 28.5 - 50.6 of ram lamb is higher than 16.3-40.2 of ewe lamb. Macdowell, (2002) observed that ram lamb usually performed better than ewe lamb in term of head length (HL) under free-range system of production, this was probably due to some physiological factors, genetic or environmental factors (Njwe, 1992). Sometimes, ewe lambs is infected with a disease known as pneumonia (at 2 week of age), coccidiosis (at 1-4 month of age) during the course of the experiment which easily increase the temperature from 41-42^{o}C, and the normal temperature is 38-40^{o}C, this result to decrease in their growth performance as observed by (Fancier, 1999)

Table 2 Showed the Vertebral Rump Length Ram Lamb and Ewe Lamb

No. of weeks	RL (Ram Lamb)	EL (Ewe Lamb)	Ratio (RL)	Ratio (EL)
1.	**40.7**	**30.1**	**3.4**	**2.5**
2.	42.6	32.5	3.6	2.7
3.	45.5	35.9	3.8	2.9
4.	47.6	37.5	3.9	3.1
5.	49.8	39.4	4.2	3.2
6	51.4	41.4	4.3	3.5
7.	54.6	43.7	4.6	3.6
8.	56.8	45.8	4.7	3.8
9.	58.2	48.7	4.9	4.1
10.	60.5	50.0	5.0	4.2
11.	62.4	53.8	5.2	4.5
12	65.1	55.6	5.4	4.6
	$n_1 = 12$	$n_1 = 12$	$R_1 = 53$	$R_2 = 42.7$

Where:
n_1 = Total number of observation in group 1
n_2 = Total number of observation in group 2
R_1 = Sum of ratio of group 1
R_2 = Sum of ratio of group 2

Vertebral rump lengths (VRL) are presented in table 2, the result 40.7- 65.1 of ram lamb was higher than 30.1-55.6 of ewe lamb and the difference could be attributed to the effect of nutritional imbalance, metabolic upset, poisons and inherited trait which can be prevented or corrected by sound management techniques Kellems and Church,(1998). Despite the fact that ram lamb recorded a diseases whichreadily affect their head length (Gefu *et al,* 1984), thus, (Fancier, 1999) also observed that, ram lamb performed better in rump length than ewe lamb under free range system of production this is because a healthy baby lamb show interest in dry feed at 10days of age, thus, they might be able to start easily on dry palatable feeds like maize offal, oat, soya beans meal in addition to commercial feeds

Table 3 Showed the Rump tail of Ram Lamb and Ewe Lamb

No. of weeks	RL (Ram Lamb)	EL (Ewe Lamb)	Ratio (RL)	Ratio (EL)
1.	**30.2**	**20.8**	**2.5**	**1.7**
2.	32.8	22.7	2.7	1.9
3.	34.6	24.6	2.8	2.1
4.	37.5	28.8	3.1	2.4
5.	40.1	30.1	3.3	2.5
6	42.0	32.1	3.5	2.7
7.	45.5	34.9	3.8	2.9
8.	47.7	38.5	3.9	3.2
9.	50.8	40.5	4.2	3.4
10.	54.6	42.6	4.6	3.6
11.	55.9	46.2	4.7	3.9
12	58.4	49.3	4.9	4.1
	$n_1 = 12$	$n_1 = 12$	$R_1 = 44$	$R_2 = 34.4$

Where:
n_1 = Total number of observation in group 1
n_2 = Total number of observation in group 2
R_1 = Sum of ratio of group 1
R_2 = Sum of ratio of group 2

Rump tails (RT) are presented in table 3, The results indicated that 30.2 - 58.4 ram lamb was higher than 20.8 - 49.3 ewe lamb, this indicates that male (ram lamb) performed better than female (ewe lamb) under natural grazing due tothe facts that most of the forages in the region (Tropic) are depleted or reduced in terms of nutrients. Thus, because of the depletion of nutrient it cannot support adequate growth and development as indicated Nuru, (1999). The result also revealed that, the rump tail of ram lamb was higher than ewe lamb which agreed with the report obtained by Osinowo and Ogusuji, 2002 that the differences could be attributed as a result of the physiological factor of ram lamb in terms of digestive capacity, efficiency of nitrogen utilization and recycling of nitrogen, the result also confirmed that rump tail was higher in ram lamb compared toewe lamb in white Fulani sheep.

Table 4 Showed Height at Withers of Ram Lamb and Ewe Lamb

No. of weeks	RL (Ram Lamb)	EL (Ewe Lamb)	Ratio (RL)	Ratio (EL)
1.	38.1	40.3	3.2	3.4
2.	48.8	42.1	4.1	3.5
3.	50.4	45.8	4.2	3.8
4.	52.7	49.5	4.4	4.1
5.	54.5	52.1	4.5	4.3
6	56.7	58.1	4.7	4.8
7.	58.1	60.8	4.8	5.1
8.	60.2	67.0	5.0	5.6
9.	62.5	69.4	5.2	5.8
10.	65.3	75.2	5.4	6.3
11.	68.1	78.8	5.7	6.6
12	70.0	80.6	5.8	6.7
	$n_1 = 12$	$n_1 = 12$	$R_1 = 57$	$R_2 = 60$

Where:
n_1 = Total number of observation in group 1
n_2 = Total number of observation in group 2
R_1 = Sum of ratio of group 1
R_2 = Sum of ratio of group 2

Heights at withers (HW) are presented in Table 4, the result 40.3 - 80.6 ewe lamb performed better than 38.1 -70.0 ram lamb, this could be attributed to feeding under natural grazing system of production, and lambs are susceptible to pneumonia from two weeks to six month of age Lakpini, (1986).

Table 5 Showed the Girth Circumference of Ram Lamband Ewe Lamb

No. of weeks	RL (Ram Lamb)	EL (Ewe Lamb)	Ratio (RL)	Ratio (EL)
1.	**30.2**	**40.4**	**2.5**	**3.4**
2.	36.7	44.2	3.1	3.7
3.	40.6	47.1	3.4	3.9
4.	45.2	50.7	3.8	4.2
5.	48.3	54.8	4.0	4.6
6	51.1	57.7	4.3	4.8
7.	54.5	60.2	4.5	5.0
8.	57.6	64.7	4.8	5.4
9.	60.2	68.6	5.0	5.6
10.	62.1	70.7	5.4	5.9
11.	67.3	74.6	5.6	6.2
12	69.5	78.0	5.2	6.5
	$n_1 = 12$	$n_1 = 12$	$R_1 = 51.6$	$R_2 = 59.2$

Where:
n_1 = Total number of observation in group 1
n_2 = Total number of observation in group 2
R_1 = Sum of ratio of group 1
R_2 = Sum of ratio of group 2

Table 6 Showed The Growth Performance of Ram Lamb and Ewe Lamb.

No. of weeks	RL (Ram Lamb)	EL (Ewe Lamb)	Ratio (RL)	Ratio (EL)
1.	**28.8**	**5.2**	**2.4**	**1.7**
2.	30.8	7.8	2.6	2.2
3.	40.2	9.5	3.4	2.9
4.	48.5	11.6	4.0	3.2
5.	50.0	13.8	4.2	3.4
6	54.9	16.5	4.6	4.0
7.	56.3	17.4	4.7	4.3
8.	58.6	19.1	4.9	4.7
9.	60.8	21.6	5.1	5.0
10.	63.7	23.4	5.3	5.2
11.	65.9	25.3	5.5	5.5
12	70.4	28.3	5.9	5.7
	$n_1 = 12$	$n_1 = 12$	$R_1 = 52.6$	$R_2 = 47.8$

Where:
n_1 = Total number of observation in group 1
n_2 = Total number of observation in group 2
R_1 = Sum of ratio of group 1
R_2 = Sum of ratio of group 2

Live weight gain are presented in Table 6, the result 28.8 - 70.4 of male sheep (ram lamb) revealed higher weight gain than 20.2 - 60.3 female sheep (ewe lamb) under natural grazing or free-range system of production which agreed with the finding of Rahjhan, (2001). This could be attributed to physiological and nutritional condition, that male sheep (ram lamb) put more weight than the female sheep (ewe lamb) under natural system of grazing, also harsh environmental condition will influence the reproductive performance of ewe lambs Kellems and Church, (1998)

Recommendation

Farmers should be educated and enlightened on the need toimproveon the existing natural pasture by planting difference forages alongside the existing once. Government and other private organization should invest in range management so that there will be available and improved feeds for our livestock. More research should be conducted to explore the livestock sector.

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