

PERFORMANCE AND CARCASS CHARACTERISTICS OF WEANER RABBITS FED WITH VARYING LEVELS OF SUN-DRIED SHEEP RUMEN CONTENTS AS A REPLACEMENT FOR MILLET OFFAL

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ABSTRACT

The research was conducted to evaluate the performance and carcass characteristics of weaner rabbits fed with varying levels of sun-dried sheep rumen contents (SDSRC) as replacement millet offal (MO). Fifty weaner mongrel rabbits of mixed sexes between 5 and 7 weeks of age were allotted to five dietary treatments replicated five times with two rabbits per replicate in a completely randomized design with SDSRC replacing MO at 0, 25, 50, 75 and 100% designated as diet 1, 2, 3, 4 and 5 respectively. Total, final, daily weight gains and feed conversion ratio were significantly influenced by treatment effects and all other growth performance parameters were similar. Live and carcass weight varied between 990.67-1580.00g and 737.00-1184.67g and were also affected ($P<0.05$). Pelt, head/legs, kidney and large intestine depicts significant difference among the diets. It can be deduced from the study, that SDSRC could replace MO at 75% level without placating performance and carcass attributes of growing rabbits. It was therefore recommended that rabbits keepers should incorporate when formulating diets in order to reduce cost of production.

Keywords: Weaner rabbits, millet offal, rumen content, performance and carcass

INTRODUCTION

The problem of inadequate protein supply in developing countries can be alleviated by increased rabbit production. High demand for animal and scarcity of resources has necessitated more research on livestock with short generation intervals (AbdulRashid and Juniper, 2016). Nutritionally, rabbit meat has a higher protein (20-21%), lower calories (1749kcal/kg) and lower fat content (10-11%) when compared with meat from most livestock species and is recommended for consumption for persons with cardiovascular illness (Monica *et al.*, 2010). Janieri (1987) reported that rabbit has the lowest cholesterol value of 169mg/100g (dry matter basis) when compared with beef (200mg), chicken (200mg) and pork (223mg) it is also low in sodium content. Rumen contents are very rich in crude protein (10-25%) and high (25%) in crude fibre. The later limits its use in poultry nutrition. Several experiments were conducted on the suitability of sun-dried rumen contents (SDRC) as feedstuff for livestock such as rabbits and poultry (Gwayo, 2007; Saidu *et al.*, 2022). Preliminary studies of Mohammed *et al.* (2011) indicated that differences exist between the rumen contents of cattle, camel, sheep and goat with respect to nutrient composition, amino acid profile, and microbial assay. The objective of the experiment is to evaluate the performance and carcass characteristics of weaner rabbit fed with different levels of SDSRC.

MATERIALS AND METHODS

The experiment was conducted at Bauchi State College of Agriculture, Bauchi Rabbitry Unit, located along Bauchi – Dass Road. The rumen contents were collected at Bauchi main abattoir from certified healthy sheep slaughtered immediately after the rumen was incised, the collection of the rumen contents was done in the early hours of morning while slaughter is going on to avoid mixing the rumen contents with that of other species of animals as while as their faeces and blood. The rumen contents were spread on concrete floor and sun dried for seven days by constant raking to ensure complete drying. Fifty mongrel weaner rabbits of mixed sexes between 5 and 7 weeks of age were purchased from rabbit keepers within Bauchi town and its environs. The weaner rabbits were allowed one-week acclimatization period, during which commercial growers mash (vital feed), groundnut haulms and water were supplied *ad libitum*. After the first week of acclimatization the rabbits were randomly allotted to five dietary treatments replicated five times with two rabbits per replicate in a completely randomized design. Five diets were formulated in which sun-dried sheep rumen contents replaced Millet offal at 0, 25, 50, 75 and 100% levels coded as diet 1, 2, 3, 4 and 5 respectively (Table 1). At the commencement of the experiment each rabbit was weighed to determine its initial weight using SF-400 digital weighing scale. Daily feed intake was calculated by subtracting the left over from the feed given to each rabbit on a daily basis. Each rabbit was weighed on weekly basis to obtain the weekly and daily body weight gain throughout the experiment. At the end of the experiment one rabbit was selected from each replicate for carcass and organ evaluation whereby they were starved for 12hrs,

parameters were measured using digital scale(g) and ruler(cm). Data collected were subjected to one-way analysis of variance (ANOVA) as completely randomized design using Statistical Package for Social Sciences (SPSS).

Table 1: Composition of Experimental Diets Containing Sun-dried Sheep Rumen Contents (SDSRC) as a Replacement for Millet offal

Ingredients	Diets				
	1(0%)	2(25%)	3(50%)	4(75%)	5(100%)
Maize	35.4	35.4	35.8	35.4	35.4
Soybean meal	11.9	11.9	11.5	11.9	11.9
Millet offal	30.0	22.5	15.0	7.5	0
SDSRC	0	7.5	15.0	22.5	30.0
Bone meal	2.0	2.0	2.0	2.0	2.0
G/nut haulms	20.0	20.0	20.0	20.0	20.0
Premix*	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25
Lysine	0.1	0.1	0.1	0.1	0.1
Methionine	0.1	0.1	0.1	0.1	0.1
TOTAL	100	100	100	100	100

RESULTS AND DISCUSSION

Table 2 shows the growth performance of weaner rabbits fed with varying levels of SDSRC. Initial weight, final weight, total weight gain, total feed intake, daily feed intake, daily weight gain and feed conversion ratio were the parameters measured. The results revealed non-significant difference ($p>0.05$) amongst the treatment means in initial weight, total feed intake and daily feed intake, the highest average initial weight was recorded in diet 3(706.00g) and diet 2(420.00g) had the least. The slight differences in mean daily feed intake (71.09-83.63g) of the present study agrees with the result obtained by (Gwayo, 2017) but disagrees with the one reported by Mohammed *et al.* (2005) of 49.02-51.05g and 8.69-11.07g respectively. The differences could be attributed to the different climatic conditions where the experiments were conducted as ambient temperature may influence feed intake and weight gain of rabbits. There was significant difference ($p<0.05$) in final, total, daily weight gains and feed conversion ratio. The values of final total feed intake and total weight gain reported in this study compare favourably with results obtained in similar studies (Maidala *et al.*, 2020; Mohammed *et al.*, 2005) in which graded levels of dried rumen content were incorporated into the diets of growing rabbit at various inclusion levels.

The carcass characteristics of weaner rabbits fed varying dietary levels of SDSRC as a replacement for millet offal are presented in Table 3, the rabbit's live weight varied between 990.67-1580.00g for those fed diet 5 and 4 respectively and there is significant ($p<0.05$) difference among the diets. The carcass weight follows the same pattern as live weight where the least value was recorded in diet 5(737.00g) and highest in diet 4 (1184.67g). However, dressing percentage is not influenced by the diets ($p>0.05$), where the least dressing percentage is in diet 5(74.40%) and the highest in diet 3(75.47%), the pelt, head/legs as well as the kidney were affected by the dietary treatments ($p<0.05$), with the least value in diet 5(80.67g), 2(118.67g) and 4 and 5(0.68%) and the highest values in diets 4(143.00g), 4(174.66g) and 2(1.08%). All the visceral with the exception of large intestine were not affected ($p>0.05$) by the diets. However, the large intestine differed ($p<0.05$) with lowest value in diet 5(57.33g) and the highest was observed in diet 4(80.00g).

Table 2: Performance of Weaner Rabbits Fed Graded Levels of SDSRC as Replacement for Millet Offal

Parameters	Diets					SEM
	1(0%)	2(25%)	3(50%)	4(75%)	5(100%)	
Initial weight (g)	442.67	420.00	706.00	632.33	436.67	38.31 ^{NS}
Final weight (g)	1314.33	1074.67	1518.00	1627.67	1006.00	48.51*
Total weight gain (g)	871.66 ^{ab}	645.67 ^{bc}	812.00 ^{ab}	995.33 ^a	569.33 ^c	25.19*
Total feed intake (g)	4343.50	3981.00	4682.57	4438.40	4593.57	435.12 ^{NS}
Daily feed intake (g)	79.94	71.09	83.63	79.19	82.05	2.43 ^{NS}
Daily weight gain (g)	15.57 ^a	11.53 ^{bc}	14.49 ^{ab}	17.77 ^a	10.17 ^c	0.45*
Feed conversion ratio	5.30 ^{ab}	6.24 ^{ab}	5.83 ^{ab}	4.48 ^{ab}	8.62 ^b	0.40*

^{abc} - Means bearing different superscripts within a row are significantly different ($*=p<0.05$) SEM - Standard error of mean NS - Not Significant ($p>0.05$)

The SDSRC were used primarily to supply fibre at the expense of millet offal. The dressing percentage (74.40 to 75.47%) recorded in this study were higher to the 45.30 to 50.18% reported by Njidda and Isidahomen (2011), that fed up to 8% sesame meal and that of Ogunsiye *et al.* (2014) (47.69 to 50.98%). The high dressing percentage could be attributed to the age, weight and content in the digestive tract at slaughtering.

Table 3: Carcass Yield, Organ and Gut Characteristics of Weaner Rabbits Fed Graded Levels of SDSRC as Replacement for Millet Offal

Parameters	Diets					SEM
	1(0%)	2(25%)	3(50%)	4(75%)	5(100%)	
Live weight(g)	1326.67 ^{ab}	1061.33 ^b	1256.33 ^{ab}	1580.00 ^a	990.67 ^b	49.57*
Carcass weight (g)	991.67 ^{ab}	797.33 ^b	951.33 ^{ab}	1184.67 ^a	737.00 ^b	39.22*
Dressing percentage	74.68	75.00	75.47	75.46	74.40	0.40 ^{NS}
Pelt (g)	117.00 ^{ab}	88.67 ^{ab}	94.00 ^{ab}	143.00 ^a	80.67 ^c	5.62*
Head/legs (g)	147.67 ^{ab}	118.67 ^b	144.33 ^{ab}	174.66 ^a	125.67 ^b	4.24*
Heart %	0.25	0.25	0.21	0.29	0.30	0.61 ^{NS}
Liver %	3.25	3.34	2.91	2.47	3.03	0.01 ^{NS}
Lung %	0.75	0.85	0.74	0.59	0.56	0.13 ^{NS}
Kidney %	1.00 ^a	1.08 ^a	0.69 ^b	0.68 ^b	0.68 ^b	0.03*
Caecal weight (g)	24.33	17.33	15.00	23.33	20.67	0.98 ^{NS}
Large intestine weight (g)	64.33 ^{ab}	64.33 ^{ab}	74.33 ^{ab}	80.00 ^a	57.33 ^b	2.20*
Small intestine weight (g)	54.33	42.33	40.67	56.33	41.33	2.02 ^{NS}
Large intestine length (cm)	39.67	43.00	38.67	45.00	41.33	1.03 ^{NS}
Small intestine length (cm)	259.33	230.00	242.66	319.67	263.67	12.46 ^{NS}
Caecal length (cm)	36.67	39.33	40.33	37.67	44.00	1.39 ^{NS}

^{ab} - Means bearing different superscripts within a row are significantly different (*= $p < 0.05$) SEM - Standard error of mean NS - Not significant ($p > 0.05$)

CONCLUSION

Based on the results obtained it can be deduced that, Sun-dried sheep rumen content can replace 75% of millet resulting into advantage of reduced feed cost (₦/kg), thereby increasing the profit margin of the producer without compromising performance and carcass attributes.

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