EFFECT OF REPLACING MAIZE OFFAL WITH RUMEN CONTENT ON CARCASS CHARACTERISTICS OF WEANER RABBITS

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ABSTRACT

This study was carried out to evaluate the effect of replacing maize offal with rumen content on carcass characteristics. The experiment was conducted at the Bauchi State College of Agriculture Rabbitry unit. Fouty five weaner rabbits were allotted to five dietary treatments replicated three times with three rabbits per replicate in complete randomized design. The experiment lasted eight weeks. Five diets were formulated with sun-dried rumen content replacing maize offal at 0, 25, 50, 75 and 100% designated as diet 1, 2, 3, 4 and 5 respectively. Feed and water were supplied ad libitum. Parameters were measured were carcass yield, weight of organs and gut characteristics. Results showed that there were no significant differences (p>0.05) in all the parameters except Intestinal length and stomach. Therefore, it can be inferred from this research that sun-dried rumen content should be included in the diet of weaner rabbits without affecting their carcass traits and health condition

Keywords: Carcass, Rumen content, Maize offal, Rabbits

INTRODUCTION

Due to the ongoing increase in the expense of producing cattle, sheep, goats, and poultry, people are now looking into less popular but potentially useful sources of animal protein, such as rabbits (Shuaibu, et al., 2020). The prolific nature of rabbits, coupled with their short gestation period and generation interval, makes them the animals of choice for multiplication and short way of increasing animal protein intake.(Saidu, et al., 2022) The problem of inadequate protein supply in developing countries can be alleviated by increased rabbit production. High demand for animal protein and scarcity of resources have necessitated more research on livestock with short generation intervals. Rabbit production is suitable because as non-ruminant herbivores, rabbits do not compete directly with man for cereal and legume grains. Rabbits are also favoured over other livestock species because of their high fecundity, low cost of investment, short generation interval and ability to utilize diverse forages (Apori et al., 2014). 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 person with cardiovascular illness. Rumen content is substantial wastes generated daily at abattoirs (Maina, et al., 2022). Agbabiaka et al. (2011) reported that rumen digester is the partially digested forage mainly found in the rumen of ruminant animals and fairly rich in crude protein content of (18.52%) however, if properly treated could be useful for livestock feed since it is relatively cheap, locally available and constitutes disposal problem at the abattoir. This study was designed to evaluate the effect of replacing maize offal with rumen content on carcass characteristics

MATERIALS AND METHODS

The experiment was conducted at the Rabbitry Unit of Bauchi State College of Agriculture Teaching and Research farm, Bauchi State. The rumen contents to be used in this research was collected from Bauchi main abattoir immediately after the rumen has been incised. The rumen contents were spread on plastic trays after the sun rise and was taken indoors after sun set. This was done for seven (7) days to ensure complete drying. Fouty five (45) weaner rabbits of mixed sexes between 5 and 7 weeks of age were randomly allotted to five dietary treatments replicated three times with three rabbits per replicate in a completely randomized design. Five diets were formulated where rumen contents replaced maize offal at 0, 25, 50, 75 and 100% levels coded as diets 1, 2, 3, 4 and 5 respectively (Table 1). One rabbit per replicate was randomly selected, weighed and starved overnight (12hrs). The fasted weight was recorded in the morning before slaughter. The organs such as lung, kidney, liver and heart were removed from individual carcasses in all the treatment groups and weighed using a sensitive weighing scale and expressed as the percentage of live weight.

RESULTS AND DISCUSSION

The effects of varying levels of rumen content as a replacement for maize on carcass characteristics and organ weights of weaner rabbits are presented in Table 2. The live weights of rabbits across treatments ranged from 832.50g to 1077.50g, with no significant differences (P>0.05) observed among treatments. Similarly, carcass weights (400.00-525.00g) and dressing percentages (44.21-48.74%) were not significantly affected by dietary treatments. These results align with findings by Saidu, et al. (2022), who reported that the replacement of maize

Table 1: Composition of Experimental Diets Containing Rumen Contents as a Replacement for Maize Offal

Ingredients	1(0%	2(25%)	3(50%)	4(75%)	5(100%)
Maize	32.0	32.8	33.8	34.6	35.4
Soybean meal	15.3	14.5	13.5	12.7	11.9
Maize offal	30.0	22.5	15.0	7.5	0
Rumen content	0	7.5	15.0	22.5	30.0
Bone meal	2	2	2	2	2
G/nut haulms	20	20	20	20	20
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**

with alternative feed ingredients did not negatively impact carcass yield and quality in growing rabbits. The weights of various organs including head, legs, tail, pelt, liver, kidney, heart, and fat deposits showed no significant differences ($P>0.05$) across treatments. The liver weights ranged from 2.16g to 2.69g, while kidney weights varied between 0.57g and 0.79g. These findings corroborate with Makinde et al. (2019), who observed that organ weights remained within normal physiological ranges when rabbits were fed non-conventional feed ingredients, indicating no detrimental effects on organ development. The gastrointestinal parameters, intestinal length showed no significant differences among treatments, ranging from 237.00cm to 312.00cm. Similarly, intestinal weight (3.65-4.32g) and caecal length (56.50-71.50cm) were not significantly affected by dietary treatments. These results are consistent with findings by Olafadehan et al. (2020), who reported that rabbits can maintain normal gut development when fed various agricultural by-products. However, stomach weights showed significant differences ($P<0.05$) among treatments, with T3 recording the highest value (8.03g) and T5 the lowest (5.16g). Similar adaptations in digestive organs were reported by Obadire et al. (2020) when studying alternative feed ingredients in rabbit nutrition. The absence of significant differences in most parameters suggests that rumen content can effectively replace maize in weaner rabbit diets without compromising carcass characteristics or organ development. This finding is supported by recent work from Saidu, et al. (2022), who demonstrated the potential of agricultural by-products as alternative feed ingredients in sustainable rabbit production systems. Fat deposition, which ranged from 0.17g to 0.35g across treatments, showed no significant differences ($P>0.05$), indicating that energy utilization was similar across the different dietary treatments. These results align with findings by Muhammad et al. (2022), who reported that properly processed alternative feed ingredients could maintain normal fat metabolism in growing rabbits. The consistent organ weights and gastrointestinal measurements across treatments indicate that the rabbits maintained normal physiological functions regardless of the level of rumen content in their diet. This observation supports research by Oloruntola et al. (2021), who emphasized the importance of monitoring organ development as indicators of dietary adequacy and animal health in rabbits fed alternative feed ingredients.

Table 2: Carcass Yield, Organ and Gut Characteristics of Weaner Rabbits Fed Varying Levels of Rumen Content as Replacement for Wheat Offal

Treatment	T1	T2	T3	T4	T5	SEM
Live weight	1077.50	970.00	905.00	1000.00	832.50	255.63^{NS}
Carcass weight	525.00	475.00	400.00	450.00	400.00	136.01^{NS}
Dressing percentage	48.18	48.74	44.21	44.88	48.18	2.37^{NS}
Head	10.70	10.91	10.62	10.61	11.12	0.71^{NS}
Legs	2.94	3.08	3.21	3.02	2.78	0.48^{NS}
Tail	0.41	0.30	0.23	0.36	0.30	0.10^{NS}
Pelt	6.00	5.79	6.03	6.03	6.43	1.05^{NS}
Liver	2.35	2.37	2.69	2.38	2.16	0.27^{NS}
Kidney	0.79	0.57	0.72	0.71	0.66	0.10^{NS}
Heart	0.27	0.21	0.22	0.21	0.30	0.09^{NS}
Fat	0.35	0.21	0.17	0.17	0.30	0.09^{NS}
Intestinal length	2045.00^{ab}	312.00^{ab}	257.00^{ab}	270.00^{ab}	237.00^{ab}	24.39
Intestinal weight	4.32	3.77	3.65	4.01	4.22	0.85^{NS}
Caecal length	56.50	68.00	56.50	65.50	71.50	17.08^{NS}
Caecal length	8.39	9.21	8.90	9.92	7.68	0.99^{NS}
Lungs	0.69	0.78	0.78	0.97	0.73	0.21^{NS}
Stomach	6.99^{ab}	5.84^{bc}	8.03^{a}	6.47^{abc}	5.16^{c}	0.61

^{ab}– Means bearing different superscripts within a row are significant different ($P<0.05$)
SEM – Standard error of means
NS – Not significant ($P>0.05$)

CONCLUSION AND RECOMMENDATION

Based on the results obtained it can be concluded that rumen content can replace 100% of maize offal as dietary source of fibre for weaner rabbits without adverse effects on their carcass attributes as such farmers can process and include it in rabbit feeds.

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