CARCASS CHARACTERISTICS OF GROWING RABBITS FED GRADED LEVELS OF TIGER NUT (*CYPERUS ESCULENTUS*) IN PLACE OF WHEAT OFFAL

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ABSTRACT
An experiment was conducted to determine the effect of using Tiger nut waste (TNW) to replace wheat offal as a fibre source in growing rabbit's diets. Thirty unsexed growing rabbits weighing about 930-980g and 6-7 weeks old were arranged into five dietary treatments on weight equalization basis. The experimental diet had wheat offal replaced at 0, 15, 30, 45 and 60% levels with tiger nut waste (TNW) regarded as T1, T2, T3, T4 and T5 respectively. The rabbits were fed the experimental diets for 10 weeks ad-libitum while cool clean water was offered liberally throughout the period. Two rabbits were used per replicate and each treatment had three replicates. They were housed in fifteen disinfected hutches for the experiment. At the end of the trial, a rabbit per replicate was severed and fasted for 12 hours before being sacrificed through severance at the jugular following the standard applicable at the Yaba College of Technology Teaching and Research Farm. They were used to estimate the carcass parameters. The result shows that the dressing percentages, final weights and the slaughtered weights were not significantly ($p>0.05$) affected by the dietary treatment. Meanwhile, the dietary treatment significantly influenced ($p<0.05$) the kidney, although the level did not constitute any threat to the rabbits. The liver was, however, statistically similar across the treatments. It was concluded that rabbit's diets can be incorporated with up to 60% TNW replacement of wheat offal for better dressing percentage and higher live weight and it is hereby recommended.

Keywords: Tiger Nut, Wheat offal, Replacement, Rabbits, Carcass

INTRODUCTION

The cost of wheat offal which is regarded as the conventional livestock's source of fiber have become a subject of concern lately due to its continuous increase in price (Mafimidiwo *et al.,* 2022). Meanwhile, dietary fibre cannot be casually waved aside in fiber sensitive livestock such as rabbits. Fiber help in increasing the feed retention time in the gastro-intestinal tract of livestock thus increasing the feed's exposure time to enzyme's action. Digestible fiber apart from being capable of generating energy for livestock also aids in gut motility (Gidenne and Michalet-Dorean,2002) thus preventing issues such as diarrhea but in high levels can lead to a condition of gut impaction and structural frame yield may result (Njoku *et al*., 2015). Rabbit production can however have its cost of feed reduced considerably if alternative sources of fibre (Adeyeye *et al*., 2018) to wheat offal can be sourced. Tigernut is a perennial tuber in the range of cassava with its sugar solubility, ease of microbial digestion and generation of high energy. Tiger nut is produced in the Northern part of Nigeria in large quantities, eaten by many while its seed is thrown away. This seed is rich in crude fiber at almost to nothing cost and easy to dry before being incorporated into livestock feed. Its nutrient content especially the waste's fiber is comparable to that of wheat offal. When lower cost per kilogram meat through efficient rabbit production is achieved, there can be an improvement in animal protein consumption in most developing countries of the world (Inyeyang and Ukpong, 2019). Therefore, the research aims at estimating the effect of utilizing TNW to replace wheat offal on carcass characteristics of rabbits.

MATERIALS AND METHODS

Experimental site, Experimental diet preparation and Animal allotment

Thirty grower (New Zealand x California) breed of rabbits weighing about 930-980g and 6-7 weeks old were procured from Institute of Agricultural Research and Training Ibadan and conveyed into the Teaching and Research Farm of the School of Agricultural Technology, Yaba College of Technology, Epe Lagos lying on latitude 6.58°N, longitude 3.98°S (Google Earth, 2024) for the experiment. Prior to their arrival, fifteen hutches were cleaned and disinfected. Each hutch was supplied with a feeding and drinking trough. The rabbits were

distributed on a weight equalization basis into five dietary treatments after observing two weeks of stabilization in the new environment. Five experimental diets containing tiger nut waste at 0, 15, 30, 45 and 60% replacement for wheat offal (NRC, 2012) Table 1. Six rabbits were allotted per treatment with two rabbits per replicate and each treatment having three replicates. The feeding trial lasted for ten weeks.

Table 1: Showing Ingredients and Nutrient composition of experimental diets.

Material	T1 0%	T2 15%	T3 30%	T4 45%	T5 60%
Maize	30	30	30	30	30
Soybean meal	14	14	14	14	14
Blood meal	1.0	1.0	1.0	1.0	1.0
Palm kernel cake	10	10	10	10	10
Wheat offal	38	32.3	26.6	20.9	15.2
Tiger nut waste	-	5.7	11.4	17.1	22.8
Molasses	2.5	2.5	2.5	2.5	2.5
Bone meal	2.0	2.0	2.0	2.0	2.0
Limestone	2.0	2.0	2.0	2.0	2.0
Salt (Nacl)	0.35	0.35	0.35	0.35	0.35
Premix	0.05	0.05	0.05	0.05	0.05
Lysine	0.05	0.05	0.05	0.05	0.05
Methionine	0.05	0.05	0.05	0.05	0.05
Total	**100**	**100**	**100**	**100**	**100**
Calculated Analysis (%)					
Crude protein	18.34	18.20	18.04	17.60	17.46
Crude fibre	7.25	7.52	7.58	8.17	8.43
Ether Extract	2.82	3.28	3.72	4.24	4.69
Ash	3.41	3.83	3.61	3.38	3.16

Data Collection

At the end of the feeding trial, a rabbit per replicate was weighed, separated into different compartments and fasted for twelve hours. They were later sacrificed by severing them through the jugular vein. They were defurred through flaring and then eviscerated using a sharp knife. The carcass weight was determined according to Jensen (1984). The cut parts and organ weight were expressed as a percentage of the live weight. The dressing percentage was also calculated (Table 2).

Statistical Analysis

Data collected were subjected to one-way analysis of variance (ANOVA) in a completely randomized design (CRD). The significant means were separated and compared using Duncan multiple range test (Duncan, 1955) of SAS (2002) at 5% level of probability.

RESULT AND DISCUSSION

The live weight observed in this research report (1.69-2.01kg) was higher than (1.18-1.28kg), eviscerated weight (1.21-1.56kg) was equally higher than (0.65-0.81kg) reported by Mafimidiwo *et al*. (2022) when urea-molasses treated maize cob was used to replace wheat offal in weaned rabbit's diet.

Similarly, the dressing percentage observed in this research (61.10-77.61%) was higher than the normal range of 50-56% (Fielding,1991) and was higher than the values earlier reported (Njidda and Isidahomen 2011; Mafimidiwo *et al*. (2022) which are 45.30-50.18 and 50.65-63.55% respectively. This could suggest that age and body weight are part of the determinant of fibre utilization in rabbits. Older rabbit may have developed a better digestive system and microbes that will be capable of breaking down fibre better than weaned rabbits. The weights of the limbs, trotters, loins and racks observed in this work were in tandem with that of Odeyinka *et al*. (2007) who fed agro-industrial waste to rabbits and recorded no significant difference ($p<0.05$) in theweights for head, trotter, rack and limbs but differs with the earlier report of Mafimidiwo *et al.* (2022) who reported significant differences in head, trotter, limbs and rack of rabbits fed urea-molasses treated maize cob as replacement for wheat offal. The values observed in this report depict higher weight in the cut parts mentioned

which was in agreement with Njoku *et al*. (2015) who observed that higher fiber in the diets of livestock could lead to a higher visceral mass yield in livestock. Organ (kidney and liver) weight observed in this work were significantly ($p<0.05$) affected by the dietary treatment, while the kidney weight (0.59-0.93%) aligned with previous findings (Mafimidiwo *et al.* (2022: 0.64-0.94%), liver weights (0.21-0.29%) were lower than previously reported values (2.39-3.35%), Critically, despite the statistical difference in liver weights, all values observed in this experiment fall within the normal physiological range for rabbits, indicating that the dietary treatments, even at the highest TNW inclusion, did not pose a health risk as reflected in these organ weights.

Table 2: Carcass Characteristics of growing rabbits fed TNW as replacement for wheat offal

Parameters (kg)	T1 (0%TNW)	T2 (15%TNW)	T3 (30%TNW)	T4 (45%TNW)	T5 (60%TNW)	SEM	P-value
Live weight	1.88	2.01	2.00	1.78	1.69	0.06	0.36
Slaughtered weight	1.80	2.09	1.94	1.76	1.60	0.08	0.35
Defured weigh	1.71^{ab}	1.91^{a}	1.85^{a}	1.50^{b}	1.51^{b}	0.06	0.05
Eviscerated weight	1.39^{ab}	1.56^{a}	1.48^{ab}	1.23^{b}	1.21^{b}	0.05	0.10
Dressing Percentage	73.94	77.61	74.00	69.10	71.60	0.04	0.21
Cut part (% of LW)							
Whole GIT	10.64^{c}	12.44^{b}	14.50^{a}	9.55^{c}	10.21^{c}	0.01	0.00
Fore Limb	9.68	9.75	9.43	10.21	9.51	5.36	0.33
Hind Limb	17.18	16.72	16.68	12.79	16.75	10.83	0.25
Rack	11.33	9.83	9.70	12.12	10.41	2.66	0.67
Loin (g)	22.52	23.28	24.83	24.05	22.76	1.55	0.42
Head (g)	8.88	9.63	8.88	8.48	8.94	0.54	0.35
Trotter (g)	1.92	2.04	1.90	1.85	1.76	0.14	0.51
Tail (g)	0.37^{b}	0.33^{b}	0.30^{b}	0.94^{a}	0.53^{ab}	0.56	0.05
Organ weight (% of Lw)							
Heart	0.30	0.30	0.35	0.32	0.32	0.05	0.66
Kidney	0.59^{b}	0.73^{a}	0.68^{ab}	0.73^{ab}	0.93^{a}	0.35	0.04
Liver	0.26^{ab}	0.27^{a}	0.21^{b}	0.25^{ab}	0.29^{ab}	0.07	0.23
Lung	0.89	0.65	0.88	0.77	0.87	0.11	0.70

CONCLUSION AND RECOMMENDATION

From this research results, it could be concluded that tiger nut waste can be used to replace wheat offal up to 60% for better weight, improved dressing percentage and perfect organ size. It is therefore recommended.

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