CARCASS YIELD AND INTERNAL ORGANS CHARACTERITICS OF WEANER RABBITS FED AFRICAN LOCUST BEAN (*Parkia biglobosa*) LEAF MEAL BASED DIETS

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ABSTRACT
This study was carried out at the Rabbitry unit of the Teaching and Research Animal farm of the federal University of Kashere to evaluate the carcass yield, cut-up parts and internal organs characteristics of weaner rabbits fed African locust bean leaf meal-based diets. A total of sixteen (16) weaner rabbits were allocated to four dietary treatments that are replicated four times with one rabbit per replicate in a completely randomized design (CRD). The experiment lasted for five (5) weeks. The results of the carcass yield showed that the carcass weight was significantly (P<0.05) affected, the values observed ranged from0.78-1.10kg, with treatment 3 having the highest value while the lowest was treatment 2. All other carcass yield parameters measured were similar. Cut-up parts measured were also similar except the thorax weight (11.79 -14.90%), where treatment 4 was significantly (P<0.05) higher. Likewise, all the internal organs measured were also similar except the weight of the legs (0.60 - 2.54%) that was significantly (P<0.05) different. This study, therefore, revealed that African locust bean leaf meal can be utilized to partially replace soya bean as dietary plant protein source without adverse effects on the carcass yield and internal organs characteristics of weaner rabbits.
Keywords: African Locust Bean leaf meal, Carcass Yield, Dietary plant proteins, Internal organs, Weaner rabbits.

INTRODUCTION

The increasing cost of the conventionally used protein sources for animal feeding is a challenge in many developing countries, particularly Nigeria (Ajimohun et al*.,* 2012). The high costs of animal feedstuff particularly of protein origin tend to suggest that alternative protein sources are to be explored (Afolayan et al*.,* 2012). The major conventional protein feedstuffs (soybean and groundnut cake) are greatly relied on for use in feed formulation, thus resulting in escalating cost of these conventional protein sources (Ajimohun et al*.,* 2012).The current situation in feed supply makes it imperative to source for other non-conventional feeds that are not used by man for feeding livestock which should not affect the production capacity of the animals, be available throughout the year and have good keeping qualities (Ahmed and Olorede, 2003). There is therefore urgent need to exploit available but relatively cheap feed resource especially those that are indigenous to our tropical environment (Esonu et al*.,* 2001).

Rabbits are monogastric animals or pseudo-ruminants that utilize fibrous plant and convert it into valuable animal protein (Ajimohun et al*.,* 2012). Incorporation of concentrates in rabbit's diet is very essential but the use of concentrates for feeding rabbits increases competition for grains with humans and agro-based industries (Egege, 1994). Presently, the scarcity and exorbitant cost of pelleted feeds make rabbit farmers to use un-pelleted feed, even though it has been established that rabbits perform better on pelleted feed (Whyte & Wadak, 2002).

There exist numerous species and varieties of plant protein sources that are yet to be exploited or under-utilized for livestock nutrition (Esonu et al*.,* 2001). Some of these novel sources may have promising and desirable nutritive quality for future inclusion in the diet of animals. Future use of non-conventional feed ingredients in farm animal nutrition is a possibility if efficiently and properly exploited (Esonu et al., 2001). Sources of protein for animal feeds are many and varied, with considerable opportunities for further diversification and substitutions. However, more research is required on alternative sources before many of the opportunities can be exploited in practice (FAO, 2004). One of this unconventional plant protein sources which have the potential for inclusion in animal feed is African locust bean leaf meal (Esonu et al., 2001). African Locust bean has a wide distribution ranging across the Sudan and Guinea Savannah ecological zones. Research studies and information about the use of African locust bean leaf meal in rabbit diets is scarce. Therefore, this study, was conceived to determine the effects of feeding African locust bean leaf meal as partial replacement for "Full-fat' soya bean on the carcass yield, cut-up parts and internal organs characteristics of weaner rabbits.

MATERIALS AND METHODS

Experimental Design

Four (4) experimental diets were formulated in which African locust bean leaf meal (ALBLM) partly replaced soya bean "full-fat" at 0 (control), 5, 10 and 15% levels designated as diets 1, 2, 3 and 4 respectively as shown in Table 1. Sixteen (16) weaner rabbits were used for the experiment with 4 weaner rabbits per treatment that were randomly allotted to four (4) replications of one weaner rabbit per replicate in a completely randomized design (CRD). The experiment lasted for five (5) weeks. At the end of the experimental period, two (2) weaner rabbits per treatment were randomly selected from the four (4) treatment and fasted for 12 hours weight, before slaughtering. The weights of the carcass, cut-up parts and internal organs were measured using sensitive balance while the lengths were measured using a ruler.

Data Analysis

Data generated were subjected to analysis of variance (ANOVA) using general linear model procedure of statistical analysis system (SAS, 2009). Where significant difference between the mean existed, Least Significance Difference (LSD) method was used to separate the means.

Table 1: Percentage composition of ALB Leaf Meal as Partial Replacement for 'Full-fat' Soya Bean in Weaner Rabbits Diets

	Diets			
Ingredients	**1**	**2**	**3**	**4**
Maize	55.41	55.41	55.41	55.41
ALBLM	0.00	1.53	3.05	4.58
Soya bean 'Full-fat'	30.54	29.01	27.49	25.96
Wheat offal	10.00	10.00	10.00	10.00
Bone meal	3.00	3.00	3.00	3.00
+Premix	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25
Methionine	0.30	0.30	0.30	0.30
Lysine	0.20	0.20	0.20	0.20
Total	100.00	100.00	100.00	100.00
Calculated Analysis				
Crude Protein (%)	18.00	18.00	17.50	17.00
ME (kcal./kg)	2,978.41	2,974.20	2,970.01	2,965.79
Crude fibre (%)	3.65	3.85	4.05	4.25
Calcium (%)	1.19	1.20	1.20	1.20
Phosphorus (%)	0.76	0.76	0.77	0.77

RESULTS AND DISCUSSION

The results of carcass yield and cut-up parts of weaner rabbits fed African locust bean leaf meal are shown in Tables 2 and 3. The dietary effects on slaughter weights, live weights and dressing percentages were similar ($P>0.05$), but carcass weight was significantly ($P<0.05$) affected across the treatment groups. The weights of the thigh, loin and kidney were not affected. This implies that the diets had no adverse effect on the carcass traits of Rabbits (Lukefar, 1990). A significant ($P<0.05$) difference in thorax weight was also observed, with diet 4 having the highest value. This finding demonstrated that certain feed formulations could significantly affect the development of thoracic components; the higher value in diet 4 suggests a favourable effect of this treatment on thorax growth. No significant differences ($P>0.05$) were observed in back weight percentages, suggesting that the treatments did not influence this parameter significantly. Breast weight percentages did not show significant differences as well. This aligns with research by Farouk et al. (2012), which indicated that breast weight is relatively consistent across different feeding treatments. Significant differences were noted in leg weight percentages, with diet 1 having the highest value which is in agreement with the findings of Eikelenboom et al. (2004), who showed that specific feeding regimes could significantly affect the proportion of leg weights.

The results of the internal organs characteristics of weaner rabbits fed African locust bean leaf meal-based diets are presented in Table 5. The highest liver weight in this study was lower than the upper limits of 3.33% and 4.46% in treatments 2, 3 and 4. As recorded for rabbits in the study by Tsado et al. (2018) and Makinde et al. (2015), respectively, the lungs percentages were higher than the values of 0.23% to 0.25% obtained for growing rabbits (Ojebiyi et al*.,* 2013). The results on the caecum, small intestine and large intestine were not significantly different across the treatment groups. The large intestines in T1 and T2 were larger than those of T3 and T4. However, with respect to the pancreas weight, treatments 1, 2, 3 and 4 were similar. The non-significant differences in heart weight suggest that thedietary treatments did not have a substantial impact on heart size or

cardiovascular health. The heart's role in pumping blood and maintaining circulation is crucial, but its weight is generally stable unless influenced by severe nutritional imbalances or health issues. This aligns with findings from Sese and Berepubo (1996), where variations in heart weight across diets were minimal, indicating that the diets did not significantly alter cardiovascular development. The non-significant differences in kidney weight indicate that the dietary treatments did not significantly impact kidney development. The kidneys' primary functions include filtration and excretion, but their weight remains relatively stable across different diets unless there are extreme dietary changes or health issues. This result is consistent with that of Ojebiyi, et al. (2013), who found minimal changes in kidney weight due to dietary treatments, suggesting that the diets did not significantly affect kidney function or size.

Table 2: Carcass Yield and Cut-up Parts of Weaner Rabbits fed Graded Levels of African Locust Bean Leaf Meal

			Diets		LSD
Parameters	**1**	**2**	**3**	**4**	
Live weights (kg)	1.05	1.03	1.33	1.20	0.39
Carcass weights (kg)	0.85^{ab}	0.78^{b}	1.10^{a}	1.00^{ab}	0.26
Dressing Percentages (%)	80.91	65.13	83.69	83.33	21.56
Back weights (%)	11.51	9.20	11.80	11.12	3.90
Thorax weights (%)	12.87^{ab}	11.79^{b}	12.88^{ab}	14.90^{a}	2.75
Thigh weights (%)	27.21	21.53	22.67	23.70	6.13
Loin weights (%)	10.32	7.50	8.16	8.93	3.59
Breast weights (%)	4.48	3.59	3.36	3.89	2.30
Head weights (%)	10.64	9.83	9.08	10.49	1.95
Legs weights (%)	2.54^{a}	1.93^{b}	1.60^{b}	1.88^{b}	0.39

$^{a, b}$ Means bearing different superscripts within the same row differ * = ($p<0.05$), NS = Not significant, LSD = Least Significant Difference

Table 3: Internal Organs Characteristics of Weaner Rabbits fed Graded Levels of African Locust Bean Leaf Meal

			Diets		
Parameters	**1**	**2**	**3**	**4**	**LSD**
Liver weights (%)	4.50^{a}	3.12^{ab}	3.95^{ab}	2.69^{b}	1.52
Spleen weights (%)	0.03	0.06	0.06	0.04	0.06
Pancreas weights (%)	0.02	0.02	0.02	0.03	0.05
Heart weights (%)	0.52	0.43	0.35	0.38	0.17
Kidney weights (%)	0.99	0.10	0.81	0.91	0.67
Lungs weights (%)	0.79	0.93	0.72	0.71	0.37
Small Intestine weights (%)	3.57	4.14	2.93	2.73	1.62
Small Intestine lengths (cm)	207.50	132.50	210.00	172.50	116.46
Large Intestine weights (%)	9.39	6.10	7.88	5.81	5.67
Large Intestine lengths (cm)	97.50	97.50	75.00	140.00	98.90
Caecum weights (%)	6.30	3.43	3.86	4.49	5.55
Caecum lengths (cm)	1.56	1.32	1.08	1.40	1.00

$^{a, b}$ Means bearing different superscripts within the same row differ * = ($p<0.05$), NS = Not significant, LSD = Least Significant Difference

CONCLUSION

Findings from this study revealed that most of the carcass and internal organs characteristics of weaner rabbits fed African locust bean leaf meal based diets measured were not affected. Thus, African locust bean leaf meal can be used as a non-conventional feed resources to partially replace 'Full-fat' soya bean up to 5% without deleterious effects on the carcass yield and internal organs characteristics of weaner rabbits.

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