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OriginalArticle

Effects of Feeding *Albizia Julirissin* leaf Meal on the Carcass and Sensory characteristics of Rabbits

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ABSTRACT

A study was conducted at the Meat Processing Unit of the Department of Animal Science, University for Development Studies, Tamale to assess the carcass and sensory characteristics of local rabbits fed *Albizia julibrissin* leaf meal (AJLM) at 0% (T0), 5% (T1), 7.5% (T2) and 10% (T3) inclusion levels. Twenty, eight-week old crossbred rabbits were used. Parameters recorded included live weight, lung weight, heart weight, liver weight, kidney weight, empty intestine weight, carcass dressing weight, cold carcass dressing weight, hot and cold carcass dressing percentages. The carcass characteristics data were analyzed using ANOVA of Genstats 4th edition.Sensory analysis was also conducted on the chest and thigh muscles to determine the influence of AJLM on rabbit flavor, colour, tenderness, juiciness, off-odour and overall liking using the British Standard Institution procedure.There was no significant difference ($P>0.05$) observed in all carcass characteristics except hot carcass dressing percentage ($P<0.05$). There were also no significant differences ($P>0.05$) in the sensory attributes except off-odour ($P<0.05$). AJLM inclusion of up to 10% level does not affect the carcass characteristics and eating quality of rabbit meat.

Keywords: *Albizia julibrissin* leaf meal, sensory, carcass characteristics, local rabbits.

INTRODUCTION

According to the FAO (1998), animal protein intake in developing countries is still far below the required standards. To bridge this gap, measures have been put in place, among them is to encourage developing countries to research and improve the productive potentials of local breeds rather than depend on exotic breeds which are usually not well adapted to the environment and management conditions in those countries (FAO, 1998). The supply of proteins from traditional livestock such as cattle, goat, sheep, pig and poultry is inadequate. This has led to a shift in emphasis on enhancing productivity of these animals. Rabbits have been identified to possess the potentials of becoming an important source of animal protein with its ability to utilize forage efficiently, which is a cheaper feedstuff (Anugwa *et al.,* 1982 and Egbo *et al.,* 2001). Rabbits can be maintained solely on green feeds together with

household vegetable waste. World production of rabbits (*Oryctolagus Cuniculus*) has been estimated to be around 1,200,000 tons per annum (Lebas and Colin, 1992). The world's production of rabbit meat was estimated to be 1.5 million tons per annum in 1994. This represents a per capital annual consumption of 280g per person per year (Moreki, 2007). In order to boost rabbit production in northern Ghana, there is the need to explore the availability and utilization of more feed resources for feeding and balancing of the diets of rabbits (Aduku and Olukosi, 1990).

Albizia julibrissin is a plant which abounds in northern Ghana but with under exploited potentials as a feedstuff. The plant is a small deciduous tree growing to 5–12 m tall, with a broad crown or arching braches (Wang *et al.,* 2006). The leaf meal of the plant is reported to have approximate compositions of 22.74% crude protein, 5.59% ether extract and 9.85% crude fibre. According to Dei *et al.,* (2012), the leaves are useful as egg yolk colourant for layer chicken. Recent experiments involving the feeding of *Albizia julibrissin* leaf meal in broiler chicken indicated that 5% inclusion level was ideal for their optimum growth and carcass characteristics (Eshie, 2013). However, based on the positive results obtained from research by Dei *et al.*, (2012) and Eshie (2013), involving the feeding of *Albizia julibrissin* leaf meal in poultry in northern Ghana, this research also seeks to explore the possibility of feeding it to rabbits in the same agro-ecological zone. The findings from the study will help augment the already existing information on the use of forage crop legumes available for feeding rabbits in northern Ghana and Ghana as whole. This study was to determine the effect of the varied levels of *Albizia julibrissin* leaf meal on sensory and carcass characteristics of rabbits.

MATERIAL AND METHODS

The experiment was conducted at the Animal farm and Meat Units of the Department of Animal Science, University for Development Studies, Nyankpala campus, Tamale. Twenty, 8 week old local rabbits consisting of 4 males and 16 females were used. Four experimental diets with substitution levels of *Albizia julibrissin* leaf meal at 0 %(T1), 5% (T2), 7.5%(T3) and 10% (T4) were used. AJLM was used to replace varied levels of combination of wheat bran, soya bean meal and sheanut cake in the diets. The diet was formulated using the trial and error method. The rabbits were randomly assigned to the four dietary treatments in a completely randomized design with five rabbits per treatment. The experiment on carcass characteristics was done by slaughtering all the rabbits from all the five replicates per treatment for carcass evaluation. The rabbits were weighed and slaughtered. The live weight, dressed carcass weight (Hot), cold carcass weight**,** carcass dressed weight, hot carcass dressing percentage, cold carcass dressing percentage, viscera weight which included the lung weight, heart weight, liver weight, kidney weight and empty intestine weight from individual rabbits in each treatment.

Sensory Evaluation

Rabbits were sticked for effective bleeding and skinned for storage in a freezer for three days. They were then deboned to obtain the thigh muscles for the sensory analysis. Pieces of the thigh muscles from each rabbit was cut and placed in an electric oven at 150^{o}C for twenty minutes. The meat were then wrapped in aluminium foil and coded for the panelist to taste. Twenty trained panelist were selected randomly among students in the University for Development Studies for the sensory evaluation. The samples were coded according to treatments. Pieces of bread and water were available to neutralize the mouth after tasting each product. Panelists were provided with response form consisting of a five-point scale according to the British Standard Institution (1993) procedure. The attributes tested were colour, off - odour, juiciness, tenderness, rabbit flavor and over-all liking.

Sensory Treatments

Sample 101: Product with no AJLM (Control); Sample 102: Product with the five percent (5%) AJLM treatment; Sample 103: Product with seven and a half percent (7.5%) AJLM treatment and Sample 104: Product with the ten percent (10%) AJLM treatment.

Data Analysis

Data collected on carcass and sensory characteristics were analyzed by means of analysis of variance (ANOVA) using GENSTATS (4^{th}Edition).

RESULTS AND DISCUSSION

Effects of ALM on the carcass characteristics of rabbits

Table 1 shows the carcass characteristics of the experimental animals. In terms of carcass characteristics, there was no significant difference ($P > 0.05$) in all parameters measured among treatment means except for hot carcass dressing (%) which showed significant difference ($P < 0.05$). In terms of absolute values, animals on the control T0 had the highest final live weight at the end of the experiment with animals on T3 having the least final live weight gain even though the difference was not significant ($P<0.05$). Lung weight, heart weight and liver weight of rabbits on all the treatments showed no differences ($P<0.05$). There was however marginal differences between means recorded. The weight of kidneys and intestine (empty) showed no significant difference ($P<0.05$) in animals fed AJLM based diets and the animals on the control. However there were numerical differences between means recorded. Animals in T0 had larger organs.

Table 1: Carcass Characteristics of rabbits fed AJLM

Parameters	T0	T1	T2	T3	S.E.D	P-Value
Live weight (g)	1196.0	1096.0	1033.0	1007.0	107.7	0.339
Lung weight (g)	7.00	8.00	6.00	6.20	0.780	0.081
Heart weight (g)	3.24	2.60	2.76	2.33	0.411	0.206
Liver weight (g)	34.2	32.6	32.4	26.2	3.99	0.236
Kidney weight (g)	10.25	8.20	8.00	7.40	1.092	0.093
Intestine Empty Weight (g)	83.5	94.6	75.6	74.6	7.50	0.061
Carcass Dressing Weight (g)	647.0	564.0	565.0	510.0	62.6	0.223
Hot Carcass Dressing (%)	54.05^{a}	51.08^{b}	54.68^{a}	50.70^{b}	1.479	0.034
Cold Carcass Dressing Weight (g)	635.0	555.0	546.0	498.0	61.7	0.214
Cold Carcass Dressing (%)	53.10	50.30	52.82	49.60	1.489	0.075

NB: S.E.D – Standard error of differences of means; P-value –Probability value
Means with the same superscripts on the same row are not significantly different.

Organ weight decreases as inclusion levels increases. The size of organs might have been influenced by the presence of anti-nutritional factorsin AJLM based diets. This finding can be supported with the report by Parigi-Bini and Xiccato (1998) that the presence of anti-nutritional factors such as mimosine, a toxic amino acid can cause growth depression at higher inclusion levels. The weight of carcass after removal of all internal organs was not different for animals from all treatments.

However, marginal differences were observed. Hot carcass dressing percentage showed significant differences ($P>0.05$). The internal organs of some animals were quite heavy at slaughter since there were fat deposits. There were no differences ($P>0.05$) in cold carcass dressing percentage even though there were moisture losses in the carcass due to freezing. The findings showed that at the end of the experiment, AJLM based diet did not have adverse effects on the carcass characteristics.

Effects of AJLM on the sensory characteristics of rabbits

Sense of sight is used to evaluate the general appearance such as colour of the product. The results showed that inclusion of AJLM at different levels did not affect ($P>0.05$) the

appearance of the meat from the rabbits. This implies that rabbit meat from animals fed AJLM would equally be patronized as the control. Juiciness refers to the availability and amount of moisture in the meat. There were no significant differences (P>0.05) in the juiciness of the meat of rabbits from all treatments. However meat from rabbits on T2 was considered to be juicer than those on T0, T1 and T3. Meat from rabbits on T2 was significantly different (P<0.05) from that of rabbits on other treatments in terms of off-odour.

Table 2: Sensory characteristics of meat from rabbits fed different levels of *Albiziajulibrissin*

Parameters	T0	T1	T2	T3	S.E.D	P-value
Colour	1.900	2.200	2.100	2.100	0.2729	0.735
Juiciness	2.35	2.70	3.00	2.30	0.306	0.084
Off-Odour	1.70^{b}	2.15^{b}	2.95^{a}	2.35^{b}	0.329	0.003
Tenderness	1.95	1.85	2.25	2.25	0.306	0.440
Rabbit Flavour	2.10	2.50	2.35	2.60	0.299	0.373
Overall liking	1.950	1.850	2.400	1.900	0.2568	0.129

NB: S.E.D – standard error of differences of means; P-value –Probability value
Means with the same superscripts on the same row are not significantly different (P>0.05)

This may be due to factors associated with storage after slaughter. Meat from rabbits on T2 was considered by the panel to have the highest off-odour. It can be observed that, as the AJLM inclusion levels increased from 0 to 7.5 percent, the off-odour characteristics increased. No significant differences (P>0.05) were observed in the tenderness of the meat products from rabbits among the treatments, indicating that AJLM had similar effect on the tenderness of the meat of the rabbits as the standard diet. There were no differences (P>0.05) in rabbit flavor as AJLM inclusion levels increased. However numerical differences showed that meat products from rabbits on T3 had more flavour followed by those on T1, then those on T2 with animals in T0 having the least flavour. No pattern was observed in the flavour of meat from the rabbits. There were no significant differences (P>0.05) in the overall acceptance of the products. However meat products from rabbits on T2 diets were preferred much compared to that of rabbits on the other treatments.

CONCLUSION

AJLM inclusion of up to 10% level does not affect the carcass and sensory characteristics of rabbit meat.

RECOMMENDATION

Farmers can use up to 10% AJLM in rabbit diet. Subsequent experiments should be carried out and inclusion levels of AJLM should be increased.

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