EFFECT OF FEEDING GRADED LEVELS OF GLIRICIDIA LEAF MEAL (GLM) ON MEAT QUALITY OF WEANER RABBITS

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ABSTRACT
The aim of this study was to determine the effect of feeding graded levels of Gliricidia leaf meal (GLM) on meat quality of weaner rabbits. A total number of 27 mixed breed unsexed weaner rabbits of 6 weeks were divided into 3 dietary treatments (Treatment 1; control, Treatment 2; 25 % inclusion level of gliricidia leaf meal (GLM) and Treatment 3; 50% GLM). Fresh Gliricidia sepium leaves were harvested, shade dried and milled to produce leaf meal. Each treatment had 8 rabbits with 4 replicates of two rabbits each in a completely randomized design. Meat quality parameters were collected for evaluation. Data were analysed using descriptive statistics and ANOVA at α 0.05. The physicochemical property (cold shortening) was significantly (P<0.05) higher in rabbits fed control with the least recorded in rabbits fed 25.0% GLM. Under the thermal shortening, the rabbits fed 50% GLM had the highest significant (P<0.05) with the least in rabbits fed 25.0%. The Oxidative rancidity indicates highest significant different fed control with least fed with 25.0% of GLM. There were no significant differences obtained in all the physical properties except the cooking loss loin. The cooking loss loin was highly significant in rabbit fed 25.0% GLM with least value obtain in rabbit fed control diet. In conclusion dietary treatments with varying Gliciridia leaf meal up to 25.0% inclusion level is highly significant different in physical properties and chemical.
Keywords: Gliricidia leaf meal, physicochemical, meat quality, weaner rabbits and oxidative rancidity

INTRODUCTION

The search for alternative feed resources for farm animals as a way of reducing production costs, and making livestock products more readily available to the populace in the tropics is far from over (Herbert, U 1998). A situation in which the average Nigerian still consumes only about 7.4g of animal protein per day (FAOSTAT. 2005), which is still far below the recommended animal protein level of 35g per required by an average adult human for proper health, is undesirable. It is known that some tree legumes in the tropics, notably *Gliricidia sepium* have attracted attention for their ability to provide large quantities of high quality forages all year round as well as their ability to maintain a sustainable environment and soil fertility through nitrogen fixation (FAO 2000). The use of these legumes as livestock feeds has the potential of significantly bringing down the cost of commercial livestock feeds, which are very high in Nigeria, primarily because the conventional ingredients used to supply the protein components in these feeds also serve as food for humans, and as raw materials in industries. However, studies by Akpata (1989), Aletor and Aledetimi (1989) and Ologhobo *et al.* (1993) have shown that the use of some legumes as protein sources could produce some undesirable physiological and biological alterations when such legumes are fed in their raw state to monogastric animals, which may be manifest in the carcass characteristics and meat qualities of the animals. Since these qualities reflect the physiological responses of animals to their health, environment and nutrition (Ologhobo *et al*. 1993) values reported for rabbits in the temperate zone may not be useful in assessing the health and nutritional status of rabbits in the production. This study was therefore carried out to ascertain the effect, on the carcass characteristics and meat quality of rabbits, of feeding diets in which soybean meal (SBM) was replaced at varying levels with Gliricidia-based diet to rabbits' production.

MATERIALS AND METHODS

This experiment was carried out at Animal Products Laboratory of Animal Production Department Faculty of Agricultural Science University of Jos, Jos, Plateau State Nigeria located between latitude 9^0 E55' North of the Greenwich meridian and longitude 8^0 E54' East of the Equator

Experimental site/study location: The research was carried out at Dagwom farm division of the National Veterinary Research Institute (NVRI) Vom, Jos south Local Government Area of Plateau State Nigeria. Experimental Diet: Fresh *Gliricidia sepium* leaves were harvested, shade dried and milled to produce leaf meal. Three diets were formulated to contain *Gliricidia sepium* leaf meal (GLM) at 0 (control), 25.0% and 50.0% levels.

Experimental Animals and Data Collections: A total number of 27 mixed breed unsexed weaner rabbits of 6 weeks was divided into three dietary treatments (Treatment 1; control, Treatment 2; 25 % inclusion level of Gliricidia leaf meal (GLM) and Treatment 3; 50% GLM) of 9 rabbits each.

Meat quality evaluation

Water holding capacity: was determined according to Wardlaw and Maccaskill, (1973).

pH: according to method described by (Oyewole and Ogwegbu, 1986).

Cold shortening and thermal shortening

$$\text{Cold shortening} = \frac{\text{Initial length} - \text{final length}}{\text{Initial length}} \times 100$$

$$\text{Thermal shortening} = \frac{\text{Initial length} - \text{final length}}{\text{Initial length}} \times 100$$

Cooking yield

$$\text{Cooking yield} = \frac{\text{Weight of cooked meat}}{\text{Weight of raw meat}} \times 100$$

Oxidative rancidity: Thiobarbituric acid value (TBA) was estimated by modified methods of (Wardlaw *et al,* 1973).

Experimental design: A completely randomized design was used for this experiment (CRD).

Data Analysis: All data that were generated were analyze using SPSS version 25 and differences between

means were separated using the DUNCAN'S multiple range test.

RESULTS

Figure 1 shows the effect of Gliricidia leaf meal on Physicochemical. The physicochemical the cold shortening indicates highest significant different in rabbit fed control with least in rabbit fed 25.0% GLM, under the thermal shortening the rabbits fed 50% GLM indicates the highest significant different with the least in rabbits fed 25.0%, the Oxidative rancidity indicates highest significant different fed control with least fed with 25.0% of GLM.

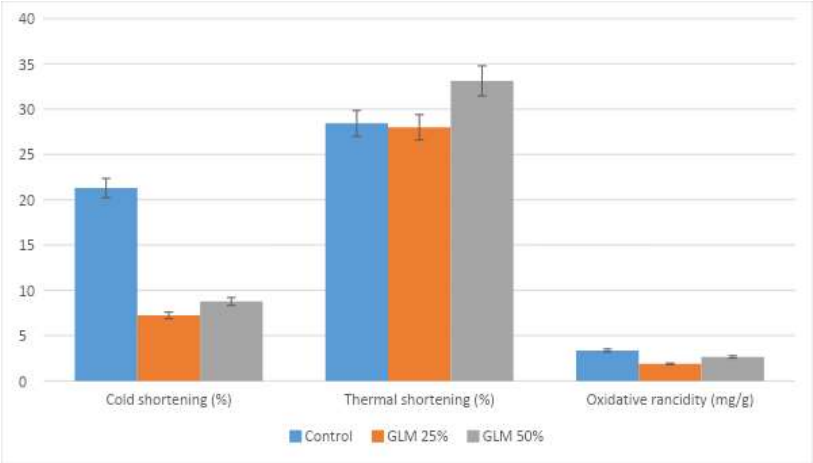

Figure 1: Effect of Gliricidia leaf meal on Physicochemical properties of rabbit meat

Table 1 shows the effect of Gliricidia leaf meal on Physical Properties There were no significant different obtained in all the physical properties except the cooking loss loin. The cooking loss loin was highly significant in rabbit fed 25.0% GLM with least value obtain in rabbit fed control diet.

Table 1: Effect of *Gliricidia sepium* leaf meal on Physical properties

Parameters	Control	25% GLM	50% GLM	SEM
Cooking Loss Loin (%)	17.27[b]	21.61[a]	16.82[b]	4.66
Cooking Loss thigh (%)	23.13[a]	20.47[ab]	17.23[b]	4.77
pH	6.98	6.85	6.97	0.03
Water holding capacity (%)	55.00	44.44	46.11	2.60

[a, b] Means in the same row not sharing superscript are significantly different at P<0.05.

GLM = Gliricidia leaf meal

SEM = Standard error mean

DISCUSSION

Meat quality is usually defined as a measurement of attributes or characters that determine the suitability of meat to be eaten as fresh or stored for reasonable period without deterioration (AOAC 2000). Meat quality and consistency are important in ensuring consumer satisfaction. Quality of meat is affected by the genetic propensity of the animal, how the animal is reared, and the nutritional status during production. These factors affect the fat, lean and connective tissue component of meat and therefore influence meat quality. Genetic differences are being understood as genetic markers are being developed for many major quality characteristics within species. As the production segment selects animals to maximize quality, reduction in meat quality can be obtained. However, these animals must be fed and reared to maximize quality. Quality also is strongly influenced by conditions at the slaughter plant. How animals are handled pre-slaughter affects the rate of rigor mortis. The application of stunning and exsanguination methods that ensure reduced animal stress are important to meat quality. The application of electrical stimulation and how the carcass is chilled influence the rate of rigor mortis and subsequent meat quality. In this study, the physicochemical the cold shortening indicates highest significant different in rabbit fed control with least in rabbit fed 25.0% GLM, under the thermal shortening the rabbits fed 50% GLM indicates the highest significant different with the least in rabbits fed 25.0%, the Oxidative rancidity indicates highest significant different fed control with least fed with 25.0% of GLM. The cooking loss loin was highly significant in rabbit fed 25.0% GLM with least value obtain in rabbit fed control diet. Similarly, the sensory evaluation the colour indicates highly significant different in control with least in rabbits fed 25.0% GLM, aroma indicates highly significant different in control with least in rabbit fed 50.0%, flavour having highly significant different in rabbit fed 50.0% GLM with least in control, juiciness indicates highly significant different in rabbit fed 50.0% GLM with least in control, tenderness indicates highly significant different in control with least rabbit fed 25.0% GLM, texture indicates highly significant different in rabbit fed 25.0 with least in control and overall acceptability shows highly significant different in rabbit fed 25.0% with least fed control which agrees with the finding of Amata I.A.(ElMasry *et al* 2012) the effect of feeding Gliricidia leaf meal on the hematological, serological and carcass characteristics of weaned rabbit in the tropics. Also, this result was in agreement with the result of (Amata 2010) who work on Effects of *Albizia julibrissin* Leaf Meal on the Carcass and Sensory Characteristics of Local Rabbits (*Oryctolaguscuniculus*). The result obtained could be due to the bioactive compound presence in the Gliricidia.

CONCLUSION

In conclusion dietary treatments with varying Gliciridia leaf meal up to 25.0% inclusion level is highly significant different in physicochemical properties. Dietary treatment has no adverse effects to meat quality.

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