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Carcass Characteristics of Rabbit Does Fed *Aspilia africana*

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***Abstract* – The study was carried out with thirty (30) dutch breed rabbit does aged 5 to 6 months to determine the effect of feeding *Aspilia africana* on the carcass characteristics of rabbit does. The animals were housed singly in rabbit hutches made of wood and wire-mesh. Two weeks pre-experimental quarantine period was allowed to enable the animals adjust to the new environment. The experiment was in a completely randomized design with three treatment groups. The treatment consisted of mixed forages (made up of *Panicum maximum, Ipomea batatas leaves, Centrosema pubescens and Musa sapientum leaves)* without *A. africana* (T_1; control), fresh *A. africana* (T_2) and wilted *A. africana* (T_3). Each treatment was replicated 5 times with 2 replicates. The same concentrate diet was fed to the rabbits in all the treatment groups throughout the period of the experiments. At the end of the experiment, two does in each treatment group were slaughtered for carcass evaluation. The results obtained showed that the initial body weight of the rabbit does was 1.74kg. Does in T_2 and T_3 had significantly higher ($P<0.05$) live weights 3.20kg and 3.05kg respectively than T_1 (1.45%); higher carcass weights of 2.95kg and 2.81kg respectively than T_1 (1.20kg) and also higher dressing percentages of 92.51% and 92.03% respectively than T_1 (83.46%). The organ weights for T_2 (liver: 37.00g and kidney: 207.00g) and T_3 (liver: 30.30g and kidney: 171.70g) were higher than T_1 (liver: 17.88g and kidney: 156.15g), suggesting that *Aspilia africana* is nutritionally suitable for feeding rabbits and can be tolerated by rabbit does.**

***Keywords* – *Aspilia Africana,* Carcass, Characteristics, Does, Rabbit.**

I. INTRODUCTION

Animal scientists in developing countries had for long identified the cost of finished livestock feed as most economically limiting factor in the industry [1]. A study of the intensive livestock industry in Nigeria indicates that although there is widespread interest in animal farming, such enthusiasm has been greatly dampened by the phenomenal rise in cost of feed caused by the high cost of the major energy and protein ingredients such as oil seed cakes, maize, guinea corn, soybean and fish meal [2]. High cost of animal feeds poses serious challenges on profitable rabbit production in the country. High feed costs are mostly the case and their availability is not secured. The insecurity according to [3] is due to seasonal fluctuation following unpredictable climatic conditions. This calls for brainstorming as nutrition is among the key factors in determining animal performance [4]. Thus, the need for alternative nutrient sources for this micro-livestock in the country. The search for alternative feed ingredient for livestock feeding has continued to attract the attention of researchers especially in the developing nations of the world [5]. This can be attributed to increasing competition between man, industries and livestock for the major available ingredients for food, industrial raw materials and feed in order to survive [6]. Feed as part of the general input in animal production in general accounts for about 75 – 80% of the cost of production [7]. Reference [8] also noted that competition between humans and animals for available grains makes nutritional requirements at reasonable cost more difficult to achieve. In a bid to search for alternative feed ingredients, it is important that the ingredient being considered should have a better or at least a comparable nutritive value with the conventional being replaced at an equal or lower cost [9]. A possible option of exploring into the utilization of ingredients or substitutes which do not form part of food for humans and industry was suggested by [3]. Thus, forages can favourably fit in as a substitute.

Forage could play important roles in being converted into useful products (meat and pelt) [10]. Forages are currently being relished by small ruminants and could be offered to rabbits for improved performance. They may be eaten directly from the natural growth of the plants or as coppice (cut and carry) [10]. One of such plants is *Aspilia africana* [11]. There is therefore the need to determine the nutrient composition of any feeding material being considered and its effects on test animals before one can say whether or not such feeding material would partly or completely replace those that are conventionally being used. Should such an intention be satisfied, it will help to take pressure off conventional protein and energy ingredients such as maize, guinea corn, soyabeans and groundnuts [12]. The green plants of various sources have long been recognized as the cheapest and most relatively abundant sources of protein [13]. *Aspilia africana* as one of the plants analyzed by [14] for its chemical composition, vitamins and minerals was found to contain the following constituents comprising alkaloids (1.24 to 1.48mg/100g), saponins (1.4 to 1.72mg/100g), flavonoids (1.46 to 1.86mg/100g), phenols (0.06mg/100g) and tannins (0.04 to 0.05mg/100g). It contains ascorbic acid, riboflavin and thiamin. It is a good source of minerals such as Ca, P, K, Mg, Na, Fe and Zn. Reference [11] reported a significantly higher RBC, Hb and PCV values for rabbit does fed *Aspilia africana.*

The quality of nutritional materials made available to an animal exerts influence on the value of its carcass [15]. Proper understanding of the concept of 'carcass' may be of help in the evaluation of meat quality [16]. Carcass is that part of animal which remains after slaughter and removal

of external and internal by-products. It consists of four main components which are muscle, connective tissues, bone and fat [17]. In addition to age, breed and species, plane of nutrition and dietary manipulations exert several influences on the development of carcass traits, organ and certain muscles [17]. Research findings by [18] indicated that feeding high fiber diets reduce body and liver fat depositions, increases carcass yield and laid down tissues. Reference [19] stated that dietary fibre may increase length and thickness of the gastro-intestinal tract, thus reducing processing yield and carcass value. Reference [20] reported a dressing percentage of 74% for rabbits in Nigeria. Reference [21] reported dressing percentages of 50.56 – 57.01% and [22] and [23] reported 50 – 56%. Increase in organ weights has numerous advantages. References [24] stated that increase weight of kidney may result in better homeostasis as well as increase in production of erythropoietin. Reference [25] suggested that in most species, the kidney is both the sensor organ and the major site of erythropoietin.

However, the effects of feeding *Aspilia africana* on carcass characteristics of rabbit does has not been evaluated. The present study is therefore, designed to accomplish this fundamental task.

II. Materials and Methods

A. Location and Site of Experiment

The research was conducted in the Rabbitry Unit of the Teaching and Research Farm of the College of Animal Science and Animal Production, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria.

Umudike bears the co-ordinate of $5°28^{1}$ North and $7°31^{1}$ East and lies at an altitude of 122m above sea level. It is located within the tropical rainforest zone and the environment is characterized by an annual rainfall of 2177mm.

B. Experimental Animals and Management

Thirty (3) sexually mature nulliparous does of dutch breed aged 5-6 months sourced from Akwa Ibom State were used for the study. A two week pre-experimental quarantine period was allowed to enable the animals adjust to the new environment. The animals were identified with numbered wooden tags. The animals were housed singly in rabbit hutches made of wooden frame and wire mesh. The animals were fed forages and concentrate diet (500 gram of forage per kilogram body weight). The composition of the concentrate diet is presented in table I. Fresh and clean water was liberally given to the animals. Routine inspection and regular cleaning was carried out. At the end of the experiment at about 18weeks, two does in each treatment group were weighed before slaughtering for carcass evaluation. The mode of slaughtering was by severing the jugular vein and whole carcass weighed. Record on dressing percentage was taken.

C. Experimental Design and Data Collection

The experiment was a completely randomized design with three treatments. The treatments consisted of mixed forages such as *Ipomea batatas* leaves, *Centrosema pubescens, Panicum* maximum without *A. africana* (control; T_1), fresh *A. africana* (T_2), wilted *A. africana* (T_3). Ten (10) does were randomly assigned to each treatment. Each treatment was replicated 5 times with 2 does per replicate.

Data were collected on the weights of the does before slaughtering, the carcass were also weighed. Weight measurements were taken using weighing balance. The organs were weighed using electronic scale.

D. Data Analysis

The data generated were analyzed using ANOVA. Significant means were separated using LSD according to the methods of [26].

III. Results and Discussion

The results of the carcass characteristics of does fed *Aspilia africana* is presented in Table II. The liveweights of the does showed significant differences ($P<0.05$) with highest mean value recorded in T_2 does, followed by T_3 while does in control (T_1) had the lowest mean value. There were also significant differences ($P<0.05$) in the carcass weight and dressing percentages between the treatment groups. These followed similar trend as the liveweight. The dressing percentages obtained in this study were higher than the 74% reported by [17] for rabbits in Nigeria. It is also higher than 50.56 – 57.01% reported by [21]; 50 – 56% by [22] and [23] indicating that *Aspilia africana* is a superior quality forage, nutritionally suitable for feeding rabbits.

The organ weights among the various treatment groups did not differ significantly ($P>0.05$). However, the weights of kidney and liver were numerically higher in does in T_2, followed by T_3. The increase in the weights of the organs may be beneficial to the animal since the advantages of the increased organ weight are numerous. Increased weight of kidney may have resulted in better homeostasis as well as increase production of erythropoietin as reported by [24]. The increased size of the kidney may be associated with the significant increase in PCV produced by does fed *Aspilia africana* as reported by [11]. The productions of red blood cells are known to be regulated by erythropoietin. In most species, the kidney is both the sensor organ and the major site of erythropoietin as observed by [25] and this may be the case with T_2 and T_3. Thus, it is logical to deduce that the increased weights of the kidney and liver occasioned by *Aspilia africana* is also responsible for increased packed cell volume as observed by [11]. Thus, *Aspilia africana* may provide a useful agent in the management of non-responsive anaemia in both humans and animals. The does in T_1 have the lowest numerical mean values for liver and kidney, which could explain the reason for the lower PCV obtained for does in the control group (T_1) compared to the does fed *Aspilia africana* (T_2 and T_3) as reported by [11].

IV. Conclusion and Recommendation

The three treatment groups compared favourably with each other. Does fed *Aspilia africana* showed superiority in values for all the parameters investigated. Does fed *A.*

africana showed significant increase in liveweights, carcass weight, dressing percentages and had higher values for the organ weights which suggests that *Aspilia africana* can improve the carcass characteristics of rabbits fed with it. It is recommended for fattening rabbits and also recommended for feeding anaemic animals.

Table I: Percent composition of concentrate ration

Ingredients	**T_1**	**T_2**	**T_3**
Maize offal	45.5	45.5	45.5
Palm kernel cake	30	30	30
Soybean meal	20	20	20
Blood meal	2.0	2.0	2.0
Bone meal	2.0	2.0	2.0
Vitamin-mineral Premix	0.25	0.25	0.25
Salt	0.25	0.25	0.25
	100	**100**	**100**

Table II: Carcass characteristics of does in the different treatments

Parameters	**T_1**	**T_2**	**T_3**	**SEM**
Liveweight (kg)	1.45^b	3.20^a	3.05^a	0.37
Carcass weight (kg)	1.20^b	2.95^a	2.81^a	0.36
Dressing percentage (%)	83.46^b	92.51^a	92.03^a	2.65
Organ weights (g):				
Liver	17.88	37.00	30.30	7.54
Kidney	156.15	207.00	171.70	23.88

a,b,c, means in same row with different superscripts are significantly different (P<0.05)

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