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Meat Yield and Sensory Properties of Guinea Fowl Keets at 12 Weeks of Age

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ABSTRACT

In determining meat yield and sensory attributes of 12 weeks old guinea keets, ninety guinea fowl keets (*Numida meleagris*) at one-week old and of equal weights were fed conventional diet based on maize, sesame and groundnut meals (210.4 gkg-1 crude protein and 11.95 mJKg-1 ME) up to 12 weeks of age, then their meat parts yield, skin colour measurements and sensory characteristics were determined. The dressing percentage gave a mean value of 68.28, while the mean carcass parts yield showed the highest relative weights for the breast (28.1) followed by the back and neck (27.9), drum sticks and thighs (27.54) and the lowest for the wings (14.86). Hunter guinea fowl's skin colour measurements showed higher values, coinciding with the observed dark dressed carcass skin colour. Sensory properties scores for the tasted attributes showed that guinea meat have slightly desirable colour, moderately desirable flavor with moderate juiciness and tenderness.

Introduction

Guinea fowl (*Numidea meleagris*) is indigenous bird to most of the agroecological zones of both South Sudan and Sudan, as well as, to savannahs and semi-arid areas of Africa [1], it largely exists in a wild and to some extend as domesticated, where it serves as a delicacy while it constitutes a potential source of animal protein.

Guinea fowl meat is lean, it contain 80 – 87 % protein, more essential amino acids [2] and of lower cholesterol content than broilers. In contrast to chickens, guinea fowl was reported to have higher body weight and dressed carcass weight and less fats than chicken [3]. Cooking loss was reported to be higher in guinea fowl. Guinea fowl meat ranks over 60% (fair to good) for most of the evaluated parameters [4].

Reports and literatures on guinea fowl performance in captivity are scanty with little information on guinea fowl meat quality. However, its egg production is seasonal and low in wild (12 – 20/bird), but domesticated stocks start to lay at 28 – 32 weeks of age and yield 60 – 90 eggs per reproductive female per season [5]. Generally, guinea fowl is becoming extensively reared in Africa and efforts to utilize local guinea fowl for meat are being initiated including efforts to extend its eggs clutch and meat acceptability. The Present study was undertaken to evaluate guinea fowl keets meat yields and quality attributes under conventional husbandry and feeding system.

Materials and Methods

Husbandry and procedure

Ninety-unsexed guinea fowl keets (*Numidea meleagris*) were selected at one week of age on the basis of equal body weights and kept in group of ten birds per pen then reared on standard guinea keets starter ration (Table 1).

The diet was fed to nine groups of 10 keets each, the birds were kept in closed pens in an open-sided deep-litter poultry house and were allowed free access to feed and water. Continuous dim lighting was maintained through-out the experimental period of 12 weeks.

Table 1. Composition of the fed diet (gkg^{-1}).

Ingredient	Proportion
Maize	500.0
Groundnut meal	111.1
Sesame meal	100.0
Wheat bran	217.0
Filler[1]	32.9
Bone meal	5.0
Oyster shell	16.3
L-lysine HCl	9.7
Dl-methionine	2.0
Salt	4.0
Premix[2]	2.0
	1000.0
Calculated Composition	
ME, MJKg^{-1}	11.9
Crude protein	210.4
Lysine	13.0
Methionine	5.0
Crude fibre	63.0
Calcium	10.0
Phosphorus	5.0
Determined Analysis[3]	
Dry matter	948.4
Crude protein (Nx6.25)	208.9
Ether Extract	132.0
Crude fibre	48.0
ADF	135.0
ADL	40.0
Ash	13.31

[1] Sand was used as inert filler

[2] Vitamins and Minerals supplement provides (per Kg diet): Vit A15000 IU, vit D3 3000 IU, vit B1 2mg, vit B2 5.5mg, vit B12 0.01mg, D-calcium pantothenate 10mg, vit E 5mg, vit K 3mg, Niacine 25mg, choline chloride 129mg, Ethoxyquin

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10mg, Manganese oxide 32.26mg, Potassium iodide 0.706mg, cobalt sulphate 0.572mg, Zinc oxide 25mg, Copper oxide 2.588mg, Ferrocarbonate 40.646mg.

[3] Analysed values [6] are means of duplicate samples.

At the end of feeding period, the, birds were starved for 18 hours, weighed and slaughtered. Each bird was wet plucked, head and feet were removed and the carcass was eviscerated. The eviscerated carcass was weighed and dissected into breast, drumstick and thighs, wings and back plus neck. Each part was weighed into the nearest gram. Part yield refers to the part-weight:body-weight ratio. Drumsticksand thighs were subjected to colour measurements and then frozen (-20 C°) pending sensory evaluation.

Colour Measurement and Sensory Evaluation

Colour measurements were performed using Hunterlab Tristimulus Colorimeter Model D 25 M.2; Hunter lightness (1), redness (a) and Yellowness (b) were recorded.

Sensory panel session were conducted on two successive weeks to determine the quality of guinea fowl meat on selected sensory properties i.e., colour, tenderness, juiciness and flavor.

The legs (thigh and drum sticks) were thawed for 24 hours in a refrigerator (4C°), then wrapped individually in aluminum foil and roasted at 175 C° for 90 minutes. They were then cut into pieces and served warm.

Trays of samples were evaluated at each session by a panel of 12-15 semi-trained panelists [4 and 5]. Panelists were instructed to record their responses for each attributes (colour, tenderness, juiciness and flavor) on scale ranging from one to eight (eight being the most desirable).

Results and Discussion

The dressing percentage and carcass parts yield data are presented in Table 2.The dressing percentage expressed as percentage of body live weight gave a mean value of 68.28% which is in conformity with 68% and slightly higher than 67% obtained in previous studies [1 and 9], this slight differences with the previous findings could be attributed to differences in dietary regimes in those trials.

The results of guinea fowl carcass parts yield (Table 2) show that breast relative weight (28.1) ranked the highest, then followed by back and neck, drumsticks and thighs and the lowest were wings relative weights (14.86). The reason for this low proportion between the various parts of the body compared to that obtained by Agwunobi and Ekpenyong (1991) may be due to differences in dietary regimes or birds' growth performances which might be responsible for the variation in quantities of muscles, fat and bone.

Table 2. Dressing percentage and meat parts yield of guinea fowl keets slaughtered at 12 weeks of age.

Response	Mean value	± SEM
Dressing Percentage	71.06	1.3
Back and neck relative weight	27.00	1.8
Breast relative weight	27.86	1.1
Wings relative weight	14.86	0.9
Drumsticks and thigh relative weight	27.54	0.7

Values are means of 90 birds' ± standard error of the mean Hunter1, a and b colour scale components reported for guinea fowl skin colour (Table 3) are higher than these reported for broiler chicks [10] a fact which coincided with observed dark colour of guinea fowl dressed carcasses.

Table 3. Guinea fowl skin colour measurement.

Colour	Mean degree value	± SEM
[1] Drumsticks and thighs	47.03	1.51
[a] Drumsticks and thighs	3.87	0.47
[b] Drumsticks and thighs	6.80	1.28

Values are means of 90 birds' ± SEM

1 = degree of whiteness

a = degree of redness

b = degree of yellowness

The results of guinea fowl meat sensory analysis presented in Table 4, shows that the colour of cooked guinea fowl meat scored5.67whichisslightly desirable, which may be associated with the intense melanin pigment (dark colour) of guinea fowlskin. However, the rest of the attributes: flavour, juiciness and tenderness scored moderately desirable, moderately juicy and moderately tender, respectively, which are in conformity with the earlier findings that guinea fowl meat rankings were over60% (fair to good) for most of their evaluated parameters [11].

Table 4. Sensory Analysis of Guinea fowl Meat slaughtered at 12 weeks of age.

Colour	Score	± SEM
Colour-cooked	5.67	0.43
Flavour	6.00	0.31
Juiciness	6.33	0.33
Tenderness	6.57	0.29

Samples were rated at 8-point structured scales for the 4 tested attributes

Though some studies have demonstrated that guinea fowl contained more meat that was leaner, higher in protein and redder compared with chicken meat [3] and as guinea fowl age increases its meat increase in protein and fat content and shear force, whereas colour become darker, redder and yellower [3], however, these could not be ascertained in this studysince the keets were of 12weeks old and were not compared to chicken of similar age. Although the keets used in the present study were not from selected line, meat yield were comparable to those reported for other domestic fowl, however, appropriate selection and or dietary manipulation may greatly improve guinea fowl meat for tested attributes.

It seems guinea fowl's meat acceptance and its production factors can be enhanced through improvement in its growth rates and body confirmation, as well as, reproductive performance such that guinea fowl keets could reach the desired market weight at the desired age while reducing its production cost. However, the overall acceptability of guinea fowl keets' meat by the panelists was moderately desirable for most of the tested sensory attributes.

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