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ON-FARM PERFORMANCE CHARACTERIZATION OF ECOTYPES OF DOMESTIC TURKEY (*Meleagris gallopavo*) IN SOKOTO STATE

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ABSTRACT

Fifteen flocks comprising 18 toms, 44 hens and 26 poults were monitored in Dange-Shuni, Wurno and Kware Local Government Areas between August and November, 2011. The study objectives were to establish the source of stock of the indigenous turkeys, to examine the problems associated with turkey rearing and to assess the production performance of the indigenous domestic turkey under the village production system Data were collected with the aid of structured questionnaire administered by personal interview with the sellers on the source of their birds, and the keepers to solicit information on the husbandry practices. Adult turkeys (toms and hens) and poults were weighed by means of 10kg and 1000g – capacity scales, respectively. Strains of the domestic turkeys found in the studied flocks included: 'Baki', 'Banasare', 'Yarkada' and 'Fari'. Average flock size was 5.86 ± 5.39 birds made up of 3 ± 2.12 hens, 1 ± 1.6 toms and 2 ± 3.78 poults. The results showed that 'Baki' (Black) strain was heavier than 'Banasare' and other strains. It was also shown that brooding hens were heavier than resting, laying and incubating hens. Average values for live weight of toms and hens were 5588.4 ± 1437.3g and 3816.4 ± 845.5g. Poults weighed 156.36 ± 49.92g at about two weeks. Live weight of hens varied according to physiological stage (incubating; 3611.3 ± 706.6g, brooding; 4162.1 ± 761.7g, resting; 3807.6 ± 909.6g, laying; 3691.6 ± 483.2g). These conclude on the values obtained for the monitored parameters provide baseline information for further research on improvement of performance of local turkeys at village level. It is therefore recommended that efforts should be made to conserve the local varieties of domestic turkeys in the study areas and alike with the involvement of the smallholder keepers.

INTRODUCTION

Turkey production in Nigeria has largely remained at the small holder level due to various reasons ranging from management problems to lack of incentives by government. There is obvious lack of specific requirements for turkey production in Nigeria, which may be attributed to low level of research in Nigeria. More so, the lack of interest in turkey production was mainly due to government policy that liberalized turkey importation since 1977. Exotic turkey breeds that are reared in Nigeria formed about 60% of the total turkey in Nigeria market, while the rest is supply by other sources including soldiers. In addition, turkey production has not been given

its rightful attention in Nigeria despite the fact that it is known to grow faster and bigger than other poultry breeds with high rate of return on investment (Mbanaor and Sampson, 2004).

Population of turkey in Nigeria was estimated to be (0.2 million), Chicken (72.4 million), Pigeon (15.2 million), Ducks (11.8 million) and Guinea fowl (4.7 million) (FDLPCS, 1992). Nigerians consume about 8.6g animal protein per day with turkey accounting for about 1.5g despite its great potentials in the supply of good quality protein and high rate of turnover of investment. According to FGN and UNICEF (1990) as cited by Mbanasor and Sampson, (2004), turkey has no consumption problems as 116 million Nigerians are active consumers (Mbanaor and Sampson, 2004).

Turkey production in Nigeria has largely remained at the smallholder level due to high cost of feed, inconsistency in feeding programmes, as well as lack of knowledge of the adequate levels of nutrient requirement. Research into nutritional aspect of turkey production in Nigeria is however beginning to receive attention (Okoli *et al*, 2009).

Turkey is not common among poultry growers in Nigeria: a number of farms are beginning to breed the bird at commercial level owing to increasing interest as a provider of meat complementing chicken. They are mostly located in urban areas and are gradually spreading even to village farms. The fast growth in the industry requires an intensive research approach to boast its production, especially considering its potentials (Ogah *et al*., 2011).

Turkeys have also been found to be of considerable economic and social significance in the traditional life of Nigerians, in that they are used as gifts during festivals like Christmas, both as sign of appreciation and expression of goodwill. Inspite of all these attributes of the local turkey in the diets of Nigerians, its production has remained very low compared to other poultry species (Peters *et al*., 1997)

This research aimed at on-farm characterization of indigenous domestic turkeys kept by smallholders has the following specific objectives: to establish the source of the indigenous turkeys sold at the Sokoto central market, to document the various strains existing in the study area, to describe the structure of the smallholder flocks and to assess the production performance of the indigenous domestic turkeys under the village production system.

MATERIALS AND METHOD

Study Area

The study was conducted in three Local Government Areas were turkey production is more prominent (Dange-shuni, Wurno, and Kware) of Sokoto State. Sokoto is located in the north-western part of Nigeria (latitude 14-15ºN and longitudes 4-5ºE). It has a maximum temperature of 41ºC and a minimum of 13ºC (attained in the months of April and January, respectively) (Mamman *et al*., 2000). It is characterized by alternating rainy and dry seasons. The annual rainfall is about 760mm (Ojanuga, 2004).

Data Collection

Data were collected with the aid of structured questionnaire administered by personal interview with the sellers on the source of their birds, and the keepers to solicit information on the husbandry practices. Preliminarily three to six fortnightly visits were paid to the study flocks,

during which data were collected on flock size and live weight of the turkeys. The hens and their poults were weighed during each monitoring visit to the studied flocks, individually using a 10kg and 1000g weighing scales, respectively. The toms were weighed only once with 10kg scale.

Each flock was visited 3-6 times fortnightly for performance monitoring during which data were collected on hen weight, poults weight, flock size and composition, preferred colours (white or coloured), and perception about indigenous turkey rearing in the area among others. Photographs of the various strains found in the flocks were taken. The study was conducted between August and November, 2011.

Data Analysis

The data collected were analyzed using descriptive statistics such as mean, standard deviation and proportion. Analysis of variance (ANOVA) was used to establish any significant effect across the performance of the birds considering the effects of strain, and location (Gomez and Gomez, 1984).

The analysis was carried out using the Statistical Package for the Social Sciences (SPSS, 2007).

RESULTS AND DISCUSSION

Strains of Turkey in the Study Flocks

There were mainly four strains of domestic turkey in the study area: 'Baki', 'Banasare', 'Yarkada' and 'Fari' based mainly on plumage colour.

'Baki' (Black)

The 'Baki' (Black) strain is solid shiny black with a greenish patch on top and dull black under; it does not have any other colour in its plumage. Eye colour is dark brown, shanks and toes are pink, black beak, and the caruncle is red.



Plate 1: BAKI (Black) STRAIN AT WURNO

‘Banasare’ (Black, White, Gray and Brown)

The ‘Banasare’ (black, white, gray and brown) strain has a numerous different colour patterns of black, white, gray and brownish colour on its tail feather and wings, almost similar to that of ‘Yarkada’. Black beard, its head is red to bluish, shanks and toes are pale pink and the beak is grayish brown, (Plate 2).



Plate 2: BANASARE (Black, White, Gray and Brown) STRAIN AT WURNO

‘Yarkada’ (Reddish brown, Black and White)

The ‘Yarkada’ (reddish brown, black and white) strain is similar to ‘Banasare’ only that its wings are complete black and with reddish brown colour dominating the tail feathers and with shiny black and white colour patterns. Its head and caruncle are red to bluish, shanks are pale pink and eyes are dark brown, (Plate 3).



Plate 3: YARKADA (Reddish brown, Black and White) STRAIN AT DANGE

‘Fari’ (White)

The ‘Fari’ (white) strain has a white plumage, its head and caruncle are red to pinkish, shanks and toes are pinkish white in colour with brown eyes, black beard and pinkish in colour, (Plate 4).



Plate 4: FARI (White) STRAIN AT WURNO



Plate 5: BROODING HEN AT DANGE.



Plate 6: INCUBATING HEN AT WURNO



Plate 7: SCAVENGING TURKEYS AT DANGE

Flock Structure

The overall mean flock size was 5.86 ± 5.39 birds (Means and standard deviations of flock structure as shown in Table 1). The highest flock size was the flock with 10.75 ± 8.99 located in Dange. The flock with the least number was located in Kware with mean of 4.00 ± 0.00 as a result of inadequate attention given to and domestic sales and consumption of the turkeys. The results obtained from this study also agreed with that of Mallia (1999).

Table 1: Means and standard deviations of flock structure

Location	No.	Mean	S.D.
Overall	*15*	5.86	5.39
Dange	4	10.75[a]	8.99
Wurno	9	4.11[b]	2.08
Kware	2	4.0b[c]	0.00

Production Performance

Live weight of toms

Overall mean live weight of tom was 5679.20 ± 1073.60g (Means and standard deviations of weight of toms according to strain of turkey as shown in Table 2). The highest in the present study was 6067.70 ± 728.3 in the 'Baki' strain. The least tom weight belonged to the 'Banasane' strain with mean of 4902.30 ± 1307.5g even though they are all adult turkeys. The value recorded in the present study is higher than the value recorded by Ilori *et al*., (2010) of 2869.68 ± 46.08g for local turkey in Ogun state at 20 weeks of age considered to be adult turkey. No age determination was carried out for the toms covered in this study.

Table 2: Means and standard deviations of weight of toms according to strain of turkey.

Strain	No.	Mean	S.D.
Overall	*15*	5679.2	1073.5
'Banasare'	5	4902.2[b]	1307.5
'Baki'	10	6067.7[a]	728.3

Live weight of hens

The overall mean live weight of hens recorded was 3816.4 ± 845.5g. The value obtained does not agree with that of Ilori *et al*. (2010). However, the 'Baki' strain with mean body weight of 3847.9 ± 771.5g was the heaviest, followed by 'Banasare' strain with mean body weight of 3705.9 ± 1.2g while the 'Yarkada' strain recorded the least mean weight of 3642.5 ± 432.2g.

Live weight of hens across locations

The highest mean live weight of turkey was recorded in Kware Local Government Area with 4221.1 ± 577.7g. The least mean live weight recorded was 3490.3 ± 627.5g in Wurno Local Government. The differences were significant ($P < 0.05$), the observed variation may be as a result of differences in genetic potential, management or slight difference in climate between the locations.

Hen live weight as influenced by physiological stage

The hen weight did not vary significantly between the physiological stages. The physiological stage with the highest mean live weight was the brooding (4162.1 ± 761.7g) (Means and standard deviations of live weight by physiological stage in as shown in Table 5). Plate 5 shows a brooding hen with her poults at Dange. The average mean weight recorded for hens in resting and laying stage were 3807.6 ± 909.6g and 3691.6 ± 483.2g, respectively. The least mean weight was recorded by incubating hens (3611.3 ± 706.6g). Plate 6 shows an incubating hen at Wurno which means the physiological stage does not have any abnormal effect on their body weight.

Live weight of poults

The overall mean of poult weight was 609.60 ± 473.89g at about 42.90 ± 5.62 days (6 weeks) (Means and standard deviations of poult weight according to strain as shown in Table 6). The highest mean weight was recorded by 'Banasare' strain (746.0 ± 557.5g) while the least mean weight recorded was 524.8 ± 398.5g for 'Baki' strain. The variation might have result from genetic make-up of the different strains since they reared under the same extensive of local farmers.

Table 3: Means and standard deviations of live weight of hens by strain

Strain	No.	Mean	S.D.
Overall	*143*	3816.4	845.5
'Banasare'	23	3705.9[b]	1.2
'Baki'	114	3847.9[a]	771.5
'Yarkada'	6	3642.5[c]	432.2

Table 4: Means and standard deviations of live weight of hens by location

Location	No.	Mean	S.D.
Dange	47	4140.4 [a]	1.03
Wurno	74	3490.3 [b]	627.5
Kware	22	4221.1[a]	577.7

Table 5: Means and standard deviations of live weight by physiological stage

Characteristic	No.	Mean	S.D.
Overall	*143*	3816.4	845.5
Incubating	19	3611.3[b]	706.6
Brooding	18	4162.1[c]	761.7
Resting	94	3807.6[a]	909.6
Laying	12	3691.6[b]	483.2

Table 6: Means and standard deviations of poult weight according to strain

Strain	No.	Mean	S.D.
Overall	*60*	609.6	473.89
'Banasare'	23	746.0[a]	557.5
'Baki'	37	524.8 [b]	398.3

Reproduction Characteristics

The farmers in the study area reported that their turkeys become sexually matured at the age of 7-9 months or they start reproducing at second laying point with their hens. The clutch size reported in this area range from 7-12 eggs, and average incubation period of 28-30 days. Turkeys lay eggs 2-3 times in a year. These findings are comparable with those of Peters, Ikeobi and Bamkole (1997).

Source of Stock

Most of the farmers obtained their parent stock from market, some got theirs from neighbors and friends and few got their as gifts. The farmers offer their turkey to the neighbors, in farm markets or in village markets. Peters, Ikeobi and Bamkole (1997) reported similar findings.

Average Cost Price of Turkeys

Personal Communication with Sambo Maikaji, (2011). Chief of Turkey Sellers Sokoto Central Market. Sokoto State, Nigeria said that the tom price ranges from ₦5,000 to ₦7,000 and ₦10,000 or above during festivals. Hen price ranges from ₦2,500 to ₦4,000 and ₦5,000 or above during festivals while poults price ranges from ₦1,200 or above, all these prices depends on weight and size of the turkey or periods of the year.

Management System

Most of the farmers raised their turkey under free-range system where they are housed in the night and supplemented with feed in large outdoor pens. In the morning they are given some feed and then set free to wander and scavenge for food in the nearby farm land and empty lots, (Plate 7). Mallia (1999) reported that free-range poultry were fed on household scrap, discarded farm produce and grains. They are raised together with chickens and other poultry in most regions.

CONCLUSION

The result obtained shows that 'Baki' strain is heavier than 'Banasare' and other strains. Live weight of hens was found to vary according to physiological stage. The values obtained for the monitored parameters provide baseline information for further research on improvement of performance of local turkeys at village level. Efforts should be made to conserve the local varieties of domestic turkeys in the study area with the involvement of the smallholder keepers.

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