Farmers Profile, Local Fowl and their Egg Quality in Imo State, Nigeria

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Abstract: The study was carried out to determine gender influence on the raising of local chicken in six randomly selected Local Government Areas (LGAs) of Imo State, Nigeria. Eggs produced by such local fowls were also assessed for their internal quality. A total of 300 families were visited. The mean populations of local fowls in the first 3 LGAs were 151, 411, 321, 273, while the second 3 LGAs yielded 243, 203, 157 and 273 cocks, hens, growers and chicks respectively. Women were more involved in rearing of the fowls than men and the management systems practiced was mostly semi intensive and extensive types. The cocks weighed more than the hens. Common diseases encountered included New Castle, coccidiosis and chronic respiratory disease (CRD) among others. Yolk index, Haugh unit, shell thickness and egg weight varied significantly ($p<0.05$) among the second set of LGAs. Conservation to stem extinction and improvement of the fowl needs to be encouraged.
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Introduction

The Nigerian local domestic fowl is said to have descended from the red jungle fowl and domesticated from Asia in 2500 B.C. (Rose, 1997). Indigenous or native poultry could be defined as breeds or varieties of any species of poultry, which have thus developed characteristics peculiar to a geographical location (Oluyemi, 1979).

The traditional chicken production in Nigeria is based on free range system where the fowls mostly scavenge for feed picking on food scraps and insects around the households (Aganga *et al*., 2000; Moreki, 2000). This system is described as a low input – low output system, where birds are given limited amounts of feed to supplement what they scavenge (Mc Ainsh *et al*., 2004). In consequent, the local chickens and their eggs tend to be smaller than those raised on intensive farms (Awolola, 1986; Lambrou, 1993). Badubi *et al.* (2006) in their survey reported that 64.3% indigenous poultry farmers did not provide housing for their chicken, while only 35.7% provided housing of some kind.

The Nigerian local fowl is hardy, resistance to disease and very broody. The hen hatches its eggs by sitting on and covering them with her wings. The birds are well adapted to the warm tropical environment (Nwakpu *et al*., 1999). Indiscriminate cross breeding with the imported breeds have been done in an exchange program for improvement of the fowl thus giving rise to offspring with low heritable traits that were lost in the subsequent generations as a result of uncontrolled breeding. Rural dwellers derive some of their animal protein intake from these local fowls. Most of the keepers of local fowl in Nigeria have been shown to be women. There is the need for continual routine monitoring of the production characteristics of these local fowls especially in the warm humid southeastern Nigeria were they form important components of integrated livestock production system (Okoli *et al.*, 2003; Okoli, 2004). Data generated from such routine studies will form base standard statistics for the conservation and improvement of the local domestic chicken.

In this study, a survey was conducted to determine gender influence on the raising of local chicken in six randomly selected Local Government Areas (LGAs) of Imo State, southeastern Nigeria as well as the quality of eggs produced by such local fowls.

Materials and Methods

Study area: The study areas made of six Local Government Areas were randomly selected from the set of 27 LGAs that make up Imo State to cover thirty towns and three hundred families in Imo State, southeastern Nigeria. The selected Local Government Areas (LGAs) were (1) Abor Mbaise (longitude 7^o 09' E – 7^o 19' E and latitude 5^o 19' N – 5^o 32' N), (2) Ahiazu (longitude 7^o 12´ E – 7^o 20´ E and latitude 5^o 30´ N – 5^o 38´ N), (3) Owerri West (longitude 6^o 52' E – 7^o 05' E and latitude 5^o 15' N – 5^o 34' N), (4) Ezinihitte Mbaise (longitude 7^o 15' N and latitude 4^o 45' E), (5) Obowo (longitude 7^o 25' N and latitude 6^o 60' E) and (6) Owerri North (longitude 7^o 16' N and latitude 4^o 45' E). Temperatures in the study area ranged from 32.1 - 29.1^{o}C (maximum) and 24.1 - 22.2^{o}C (minimum), while relative humidity in the areas ranged from 77 – 86% between May – July, 2008 that covered the period

of study (Source: Department of Meteorological Service, Owerri, Nigeria).

Data collection: A total of 300 local fowl keeping families were visited during the study. Interviews and structured questionnaires were used to obtain the local poultry farmers' profiles. Conventional criteria were used in identifying the birds used in the study. The fowls were small in size and the plumage lacked uniformity suggesting evidence of multiplicity of genes. Selection involves lost or imposition of genes that tends toward conferment of uniformity. The fowls matured early and their body weights were less than the hybrid. The beaks and claws were thin, long and curved and shanks thin, short and slanted modified for scavenging. The hen hatched its brood of chicks by sitting on the eggs. The adult fowls were very aggressive, strong and dominant cock sired most offspring in the neighborhood. Shank length was measured according to phase of growth using measuring tape and body weight with a manually operated scale. Age of cocks and hens was 1-2 years, growers 2-7 months and chicks day old to 5 weeks. The study lasted for eight weeks.

Egg analysis was done in the Department of Animal Science & Technology, Federal University of Technology, Owerri. This was done by selecting randomly three eggs per LGA per week for eight weeks for assessment of external and internal egg parameters. Micro meter screw gauge and vernier calipers were used to determine height and width of albumen, yolk and shell thickness while electronic weighing scale employed for egg and shell weights. Haugh unit calculated by using the formula: $HU = 100\log (A+7.57-1.7W^{0.37})$ according to Haugh (1937), where HU represented Haugh unit, A represented albumen height (mm) and W represented weight of the egg in grams. Card *et al.* (1979) scored AA for a Haugh unit of 72 and above to indicate freshness of an egg. The yolk colour was determined by using yolk colour chart supplied by Roche Germany. The colours were graded (1-14) in increasing order of colour blend and intensity of the yolk. Data analysis was done using analysis of variance and separation of means done by using least significant different method by Njoku *et al.* (1998).

Results and Discussion

The results are presented in Tables 1-6 (a&b) as shown below.

Table 1a: Personal Profiles of Local Chicken Farmers in the LGAs

LGAs	Sex		Education		Other Occupation					All
	Male	Female	Formal	Informal	Farming	Trading	Civil Servant	Farming& Trading	Artisan & Farming	
1.	Nil	50	50	Nil	3	18	24	2	3	Nil
2.	2	48	48	2	14	20	10	5	1	Nil
3.	Nil	50	49	1	5	Nil	21	21	3	Nil

Table 2a: Flock Structure, Size, Mating Ratio of Local Chicken in the LGAs

LGAs	Cocks	Hens	Growers	Chicks	Flock/Household	Cock:Hen Ratio
1.	45	149	124	86	16.50	1:3
2.	64	159	119	109	13.13	1:2
3.	42	103	78	78	9.83	1:2

Table 3a: Management Practices in the LGAs

LGAs	Provision of shelter		Medical treatment				Frequency of cleaning sleeping pen				Feeding		Frequency of watering		Common diseases encountered			
	Yes	No	Daily	Weekly	Monthly	>Monthly	Daily	Weekly	Monthly	>Monthly	Scavenging	Supplement	Frequent	Not frequent	Fowl pox	New Castle disease	Coccidiosis	Chronic respiratory disease
1.	50	Nil	Nil	Nil	Nil	50	50	Nil	Nil	Nil	50	Nil	Nil	50	10	Nil	Nil	Nil
2.	49	1	Nil	Nil	Nil	50	50	Nil	Nil	Nil	49	1	1	49	20	Nil	2	Nil
3.	49	1	Nil	Nil	Nil	50	50	Nil	Nil	Nil	50	Nil	Nil	50	50	Nil	2	Nil

Table 4a: Weight (g) of the Flock

Chicken type	LGAs 1	2	3	SEM
Cock	1015.41	999.89	1019.72	11.84
Hen	863.20	875.20	880.00	14.77
Grower	344.49	322.79	374.33	17.00
Chick	33.09[b]	53.91[a]	31.71[b]	7.69

Note: Means in a row with different superscripts a and b are significantly different (P<0.05). SEM= Standard Error of Mean

Table 5a: Shank Length (cm) of the Fowls

Chicken type	LGAs 1	2	3	SEM
Cock	7.68	7.54	7.39	0.04
Hen	6.64	6.08	6.27	2.29
Grower	3.99[a]	3.44[b]	3.57[b]	0.20
Chick	2.18	2.12	2.28	0.13

Note: Means with superscript a and b in a row are significantly different (P<0.05). SEM= Standard Error of Mean

Table 6a: Egg Quality Parameters

Parameters	LGAs 1	2	3	SEM
Average egg weight (g)	38.06	37.79	37.51	0.85
Hen day egg production (%)	50.35	46.05	47.68	12.72
Albumen height (mm)	0.51	0.54	0.52	0.07
Albumen width (mm)	6.01	6.26	6.05	0.37
Yolk height (mm)	1.29	1.34	1.23	0.11
Yolk width (mm)	4.14	4.17	4.18	0.33
Albumen index	0.084	0.086	0.086	0.01
Yolk index	0.31	0.32	0.29	0.02
Yolk colour	8.67	8.67	8.78	0.18
Shell weight (g)	3.68	3.70	3.82	0.29
Shell thickness (mm)	0.30	0.25	0.26	0.03
Haugh unit	18.72	20.16	20.11	1.76

Table 1b: Personal Profiles of the Local Chicken Farmers

LGAs	Sex Male	Female	Education Formal	Informal	Other Farming	Occupation Trading	Civil servant
1.	19	31	37	13	5	35	10
2.	16	34	36	14	9	30	11
3.	10	40	31	19	11	26	13
Total	45	105	104	46	45	91	34

Table 2b: Flock Structure, Size and Mating Ratio of the Local Fowls

LGAs	Flock Structure Cock	Hen	Grower	Chick	Cock: Hen Ratio	Flock Type Cock	Hen	Per House Grower	Hold Chick
1.	82	55	59	101	1:1	2.36	2.20	3.32	2.43
2.	73	68	46	72	1:1	2.44	2.11	2.59	2.12
3.	88	80	52	100	1:1	2.80	2.42	3.05	2.53
Total	243	203	157	273					

Table 3b: Management Practices of Local Fowls in the LGAs

LGAs	Provision Yes	Of Shelter No	Medic- Yes	ation No	Frequency Daily	of Weekly	Cleaning Monthly	Pen >Monthly	Feeding Scavenging	Regime Supplement	Frequency of Watering Frequent	Not frequent	Common Diseases Encountered Chronic respiratory disease	Coccidiosis
1.	40	10	Nil	50	5	45	Nil	Nil	47	3	5	45	Nil	15
2.	43	7	Nil	46	6	44	Nil	Nil	146	4	9	41	20	Nil
3.	45	5	Nil	50	Nil	50	Nil	Nil	49	1	10	40	20	Nil

Table 4b: Weight (g) of the Flock

	LGAs			
Chicken Type	1	2	3	SEM
Cock	1247.00	1193.00	1417.00	26.00
Hen	703.00^{b}	804.00^{b}	1105.00^{a}	41.00
Grower	236.00	266.00	242.00	13.00
Chick	26.31	25.81	25.40	0.26

Note: Means within row having different superscripts a and b are significantly different (P<0.05), SEM= Standard Error of Mean.

Table 5b: Egg Quality Parameters of the Birds

	LGAs			
Parameters	1	2	3	SEM
Average egg weight (g)	33.64	33.91	33.47	0.42
Hen day production (%)	50.00	48.71	50.00	0.36
Albumen index	0.34^{a}	0.30^{b}	0.32^{ab}	0.01
Haugh unit	41.59^{a}	39.23^{b}	42.57^{a}	0.62
Shell thickness (mm)	0.21^{b}	0.22^{b}	0.46^{a}	0.05
Shell weight (g)	4.70^{a}	4.38^{b}	4.04^{a}	0.11
Yolk colour	8.00	7.75	8.38	0.31
Yolk index	0.43	0.50	0.32	0.02

Note: Means with different superscripts a, b and ab in a row are significantly different (P<0.05). SEM= Standard Error of Mean.

The farmers profile indicated more women than men as keepers of local fowls in the local government areas (LGAs). This result is supported by Nwakpu *et al.* that stated that more women were involved in local chicken rearing than men. Most of the farmers had formal education and apart from raising birds were involved in other fields of endeavour. Flock size per household as well as mating ratio differed among the LGAs. Provision of shelter was done for the chicks under a semi intensive system of management except very few less than 2% of the population of the poultry farmers in the area did not provide shelter. Therefore most of the local chicken rearers provided one kind of shelter/pen. This is not in line with that reported by Badubi *et al* that most of the farmers did not provide shelter. Medical treatment of birds was absent and this must have adversely affected the population recorded for the fowls in all the LGAs.

Common diseases observed in all the local governments were chronic respiratory disease (CRD), coccidiosis and New Castle disease. But CRD and coccidiosis were more common. The significant difference (P<0.05) in the body weight of the chicks same as within the cocks and hens in the LGAs (Table 4) could be partial since there was bulking of the birds e.g., for the chicks aged 0-5 weeks (chick phase) were weighed and grouped together. Also was the shank length disparity as observed. The egg parameters (Table 5b) showed significant difference (P<0.05) in the albumen index, Haugh unit, shell thickness and weight and yolk index. Though the score of the Haugh unit suggested that eggs were not fresh (Card *et al*., 1979). The yolk colours were mostly moderate yellow. The results of the egg quality analysis did not suggest eggs of high quality.

Conclusion

In the study birds thrived without medicaments. The local fowls need to be conserved since they possess traits of future importance in being hardy and adapted to the harsh environment and were resistant to diseases. To bridge the gap inherent in inadequate intake of animal protein local chicken might be the choice especially for the rural populace.

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