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Chicken Management Systems and Egg Production in Delta State Nigeria

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Abstract: The study was necessitated by the need to stir the minds of chicken egg producers towards adopting the best chicken management system. The extensive system of rearing chicken for egg is old and still remained the most popular in the study area. Commercial eggs production was carried out on a large scale by the few farmers who practiced the intensive (battery cage) chicken management system. A significant ($p < 0.05$) and high degree of positive relationship ($r = 0.70$) was found between chicken management system and level of egg production. Majority of the farmers would require general education, fund and technical training in poultry production to enable them adopt the intensive (battery cage) management system of rearing chickens for egg production. Mostly local chickens were reared under the extensive system. No matter the popularity, the extensive system of rearing chickens lacks the potential for increased egg production. Egg protein is regarded as luxury to the extent that children who consume eggs are regarded as thieves among most of the poor in Nigeria. More poultry farmers need to embrace the intensive (battery cage) system in order to meet the egg protein needs of the people of Delta State, Nigeria.

Key words: Chicken, management system, egg, production level, delta state, Nigeria

INTRODUCTION

The various chicken management systems in the tropics could be classified into the extensive, semi-intensive and intensive systems. Izunobi (2002); Omoruyi *et al.* (1999) and Akinsanmi (1994) described in detail, the extensive, semi-intensive and intensive systems of poultry management in Nigeria. However, Adegbola *et al.* (1986) described four systems of poultry management in the tropics namely traditional, free range, restricted range and intensive systems. Williamson and Payne (1978) observed that the major advantages of the range rearing system were that the birds acquired part of their diet by scavenging for herbage, seeds and insects and that the birds usually remained healthy. The system exposed birds to predators and unfavorable weather conditions.

On the advantages of the deep litter and battery cage chicken rearing system. Omoruyi *et al.* (1999) explained that the advantages included proper accommodation, prompt culling of unproductive birds, proper control of diseases and predators, good record keeping and high egg production. The disadvantages included high capital investment, problem of cannibalism and diseases outbreak. Williamson and Payne (1978) earlier reported that the revolution in poultry production methods had not affected the subsistence and small-scale producers in myriads of villages through out the tropics. Millions of people still depended upon back yard or small-scale production for the supplies of egg and poultry meat. Henning *et al.* (2007) reported that 84% (59.6 million) of Myanmar's total chicken population were kept under scavenging conditions while only 12% (8.7 million) were commercial layers and 4% (2.9 million) were commercial broilers.

The extensive or free range system of poultry production had continued to thrive in the tropics in spite of new technologies. Law and Payne (1999) affirmed that the growth in the poultry industry had been made possible by the introduction of intensive production systems utilizing new technologies. The strong link existing between the people and extensive poultry production systems in the tropical countries and Nigeria in particular is worth a gradual research effort with a view to making the people embrace modern poultry production technologies. The study was designed to evaluate the relationship between chicken management system and level of egg production.

MATERIALS AND METHODS

Structured questionnaire were used to collect data from extensive, semi-intensive and intensive (battery cage) producers of chicken eggs. A pre-research survey was carried out to determine the population of people engaged in egg production in the three senatorial districts. The population of intensive chicken egg producers was easily got from the Ministry of Agriculture and Natural Resources. The snow-ball sampling technique described by Ladele (2004) was used to derive the population of extensive and semi-intensive egg producers. Ten percent (10%) of extensive, semi-intensive and intensive egg producers in each senatorial district were selected to constitute the sample made up of 241 (Table 1). The respondents were dichotomized into educated and not educated using the functional literacy level of Junior Secondary School as cut-off point. Simple percentages, Chi square test and contingency coefficients were used in the data analysis.

RESULTS

Chicken management systems and major breeds of birds: More people were engaged in the extensive system of egg production. 98.71% of chickens reared under the extensive system were local breeds while 1.29% were exotic. Out of the total birds kept under the semi-intensive system, the exotic and local breeds were 42% and 58%, respectively. All the layers kept under the intensive (battery cage) system were exotic breeds (Table 2)

Management systems and level of egg of production: Under the extensive system only five out of the respondents produced 1-3 crates of eggs per day. One respondent produced 1-3 crates of eggs daily under the semi-intensive management system. The respondents produced different number of crates of eggs per day under the intensive system (Table 3). The egg production level for the three management systems were represented by a Bar Chart. The mid-point of the class interval multiplied by the observed frequency represented the production level on the Y- axis.(Fig. 1). The management systems were represented on the X-axis. There was a significant ($p < 0.05$) and high positive relationship ($X^2 = 228.88$; $r = 0.70$) between egg production level and management system.

Management systems and selected socio-economic variables: The relationships between management systems and selected socio-economic variables were tested by the use of Chi square test. The degree of relationships were further tested by the use of contingency coefficient. A significant ($p < 0.05$) and fairly positive relationship ($X^2 = 121.64$; $r = 0.58$) was found between management system and level of education. A significant ($p < 0.05$) and positive relationship was found between management system and availability of fund ($X^2 = 204.77$; $r = 0.68$), between management system and age ($X^2 = 35.04$; $r = 0.36$), and between management system and technical training needs ($X^2 = 96.51$; $r = 0.54$). The relationship between management system and number of house-hold ($X^2 = 6.19$; $r = 0.17$); between management system and poultry production experience ($X^2 = 12.05$, $r = 0.22$) were not significant ($p > 0.05$).

DISCUSSION

The popularity of the extensive system among farmers in the study area is apparently hinged on the low costs of production and lack of technical know-how. Chukwuji and Inoni (1999) found that the size of poultry business was influenced by factors such as amount of capital available, size of market and level of anticipated profit. Adegbola *et al.* (1986) stated that the extensive systems was cheap in terms of labour, material and other costs. The extensive chicken production system could be described as a low input-low out put system where the

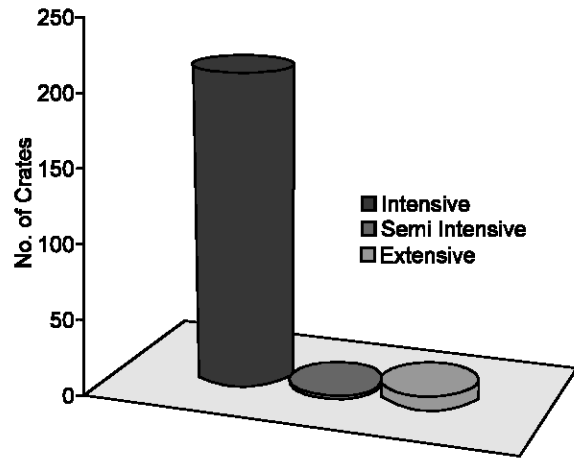


Fig. 1: Management Systems and Egg Production Level

Table 1: Sample size distribution

Management system	District	Population	Number selected
Extensive	Central	721	72
	South	857	86 (210)
	North	515	52
Semi-intensive	Central	12	1
	South	25	3 (5)
	North	11	1
Intensive	Central	54	5
	South	80	8 (26)
	North	125	13
Total		2402	241

Table 2: Management systems and major breeds of layers

Management System	Breeds		Total
	Exotic	Local	
Extensive	11 (1.29%)	840 (98.71)	851
Semi-intensive	21 (42.00%)	29 (58.00%)	50
Intensive	2700 (100.00%)	0 (0.00%)	2700
Total	2732	869	3601

birds were given limited amounts of feed to supplement what they found to eat while scavenging (McAinsh *et al.*, 2004). The few intensive poultry farms produced the egg protein needs of the people in the study area. This corroborated the findings of Akinsanmi (1994) that egg production was highest under the intensive system. He also found that the major problems associated with the raising of exotic breeds of layers commercially were their susceptibility to diseases and sensitivity to feeding and other environmental problems. Adegbola *et al.* (1986) observed that local birds kept under the extensive system for purpose of eggs performed poorly compared to the exotic breeds. They found that the local hen kept under the extensive system produced about 60 eggs whereas the exotic breed raised intensively produced about 120 eggs a year. The level of education, availability of fund and technical training in poultry production positively influenced the adoption of the battery cage system of egg production. Acbamu (2006), Adekoya and

Table 3: Management system and level of egg production. per day in crates

Management Systems	Number of Crates/per day				
	0	1-3	4-6	7-9	10-12
Intensive	0 (22.55)	2 (0.86)	5 (0.54)	10 (1.08)	4 (0.43)
Semi-intensive	4 (4.34)	1 (0.17)	0 (0.10)	0 (0.21)	0 (0.08)
Extensive	205 (182.14)	5 (6.97)	0 (4.36)	0 (8.71)	0 (3.49)
Total	209	8	5	10	4

Table 3: Continue

Management Systems	Number of Crates/per day				
	13-15	16-18	19-31	23	Total
Intensive	3 (0.32)	0 (0.11)	1 (0.11)	0 (0.00)	26
Semi-intensive	0 (0.06)	0 (0.02)	0 (0.04)	0 (0.00)	5
Extensive	0 (2.61)	0 (0.87)	0 (0.87)	0 (0.00)	210
Total	3	1	1	0	241

($X^2 = 228.88$, $p < 0.05$; $r = 0.70$). Parenthesis-Expected Frequencies

Table 4: Management systems and socio-economic variables

Socio-economic variables	Management System Extensive	Semi-intensive	Intensive	Total	X^2	r
Education						
Educated	4 (18.30)	0 (0.43)	17 (12.27)	21	121.64	0.58
Not educated	206 (191.70)	5 (4.56)	9 (23.73)	220		
Age						
15-19	1 (0.87)	0 (0.02)	0 (0.11)	1	35.04	0.36
20-24	2 (1.74)	0 (0.74)	0 (0.22)	2		
25-29	6 (6.97)	0 (0.17)	2 (0.86)	8		
30-34	10 (9.59)	0 (0.22)	1 (1.19)	11		
35-39	23 (20.04)	0 (0.54)	3 (2.80)	26		
40-44	51 (47.05)	2 (1.12)	1 (5.83)	54		
45-49	62 (57.51)	2 (1.37)	2 (7.12)	66		
50-54	24 (27.88)	1 (0.66)	7 (3.45)	32		
55-59	15 (14.81)	0 (0.35)	2 (1.83)	17		
60-64	11 (12.10)	0 (0.29)	3 (1.51)	14		
65 and above	5 (8.71)	0 (0.21)	5 (1.08)	10		
House- hold size						
1-3 members	80 (78.42)	3 (1.87)	7 (9.71)	90	6.19	0.17
4-6 members	60 (62.74)	1(1.49)	11 (7.17)	72		
7-9 members	49 (47.93)	1(1.14)	5 (5.93)	55		
10-12 members	12 (13.07)	0 (0.31)	3 (1.62)	15		
12 and above	9 (7.84)	0 (0.19)	0 (0.97)	9		
Production experience						
1-3 years	24 (23.53)	1 (0.56)	2 (2.91)	27	12.05	0.22
4-6 years	52 (50.54)	0 (1.20)	6 (6.26)	58		
7-9 years	21 (21.78)	0 (0.54)	4 (2.70)	25		
10-12 years	20 (24.40)	1 (0.58)	7 (3.02)	28		
13-15 years	51 (50.54)	2 (1.20)	5 (6.26)	58		
>15	42 (39.21)	1 (0.93)	2 (4.85)	45		
Technical Training on Poultry Production						
Yes	9 (22.66)	1 (0.54)	16 (2.80)	26	96.51	0.54
No	201 (187.34)	4 (4.46)	10 (23.10)	215		
Availability of Fund						
Available	4 (26.14)	0 (0.62)	26 (3.24)	30	204.77	0.68
Not available	206 (183.86)	5 (4.38)	0 (22.76)	211		
Total	210	5	26	241		

Parenthesis-Expected Frequencies

Tologbonse (2005) and Ekong (2003) found that adoption of innovations was influenced by cost of the innovation, triability, complexity and technicality, compatibility, relative advantage and observability.

Conclusion: The battery cage system of egg production was the best method of egg production. However, more

individuals practiced the extensive system of egg production. There is need to continually educate farmers on the social and economic benefits of the battery cage system of chicken egg production. Farmers should be encouraged through agricultural extension agents to invest in the battery cage system of chicken egg production in the study area.

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