

## Broiler Production Technology Practices among farmers in Jalingo local government area, Taraba state Nigeria

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### Abstract

Broiler production, management system, marketing were investigated among broiler producers in Jalingo local government area. A snow ball method was employed to select and interview 62 respondents using open ended questionnaires. Data was analyzed using descriptive and inferential statistics. The result indicated that broiler farmers are diverse in livelihoods and production is characterized by small scale farmers with 159 and 1,400 chickens annually. The household size of 1 and 5 (67.8 %), followed by 6 and 10 (20.90%) are frequently encountered Low stocking density, High population of youths will ensure desirability of broiler production technology information that will scale production at the farm level. Experience in broiler production ranged from 1 to 20 years. Majority of broiler farmers had between 1 and 5 years' experience. Broiler farmers had little access to extension services and credit facilities. The market age for broilers range between 5 and 9 months and mortality rates were high, with an average 10.2% and ranged 32 to 59. Brooding of chicks took place in rooms inside human dwellings. Broilers farmers (93%) practiced deep litter system. The majority (82%) of broiler farmers sell live chicken (82%) to the market, dressed whole broiler and cut up chicken parts are least important. Pricing is by feeling the weight (94%) of the broiler (heavy or light). Broiler production in Jalingo is constrained by high mortality due to biotic and abiotic diseases (heat and cold stresses). Policy makers should ensure access to funds, extension services and setting up of hatcheries. Research in favour of development of poultry breeds that can adapt heat and cold stresses should be encouraged.

**Keywords:** Broiler production, stoking density, marketing, deep litter system, vaccination extension services

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### Introduction

Poultry refers to all birds of economic value to man as source of meat and eggs. A broiler (*Gallus gallus domesticus*) is any chicken that is bred and raised specifically for meat production (Kruchten, 2002). Chicken, ducks, guinea fowls, turkeys, pigeons and ostriches are the commonly reared types of poultry in Nigeria (Adedeji et al., 2014). Many typical broilers have white feathers and yellowish skin. Commercial broilers reach slaughter-weight between four and seven weeks of age (Ojo, 2003). The Nigerian poultry sector is extremely fragmented with most of the chicken raised in 'backyards' or on poultry farms with less than 1,000 birds. However, there are a number of large commercial players in the sector most of whom are located in south-western Nigeria,

in close proximity to Lagos with large market of 17.5 million people (Sahel, 2015). The poultry sub-sector is the most commercialized in the livestock sector of Nigeria's agricultural sub-sectors (Nwandu et al. 2016). The broiler industry is capable of providing meat in a short run compared to other livestock. Broiler production is popular among small-holders farms and has contributed to the household economy. In Nigeria, poultry contributes about 15 percent of the total annual protein intake with approximately 1.3 kg of poultry products consumed per head per annum (Ologbon and Ambali, 2012). There has been significant progress in genetic selection of fast-growing meat-type chickens (Abioja, 2010), this has led to the production of broiler chickens that weigh over 2 kg at six weeks of age with 3.5 kg of a

balanced diet compared with 2 kg in fourteen weeks with 10 kg feed, although slower growing breeds reach slaughter-weight at approximately 14 weeks of age (Abioja, 2010). Commercial broiler production provides mainly poultry meat as birds are raised solely for meat. To scale domestic production of meat, chicken importation (with the exception of day-old-chicks) was banned in 2003, which spurred growth in domestic poultry production (Sahel, 2015). At present, hatcheries are being established in the country and new poultry breeds are developed. Broilers are susceptible to several welfare concerns, particularly skeletal malformation and dysfunction, skin and eye lesions and congestive heart conditions. In addition, management of ventilation, housing and stocking density (Abioja, 2010). Broiler production in Nigeria is constrained by low productivity of land races and exotic breeds, high cost of production, inadequate extension services and training facilities, low capital base, inefficient management, economic inefficiency, diseases and parasites and poor housing, high cost of feeds, poor quality of day old chicks, poor transportation network, medications, harsh weather and labor affected productivity (Adebayo and Adeola 2005). Broiler producers are scarce in Taraba state, hence broilers (live and meat) are shipped into the state capital for sales and consumption. This trend is associated with non-availability of hatcheries, feed and breed that adapt to weather pattern in Jalingo. Significant losses (mortality and capital) are recorded between February and April on annual basis, due to high temperature, hot air and low humidity. On top of that, management practices for broilers during the hot season are little understood. Consequently, small-scale broiler producers in the state have been forced out of business due to problems ranging from shortage and high cost of feed, inadequate veterinary services and drugs, poor quality of equipment and other inputs (etc.). The foregoing is responsible for the low productivity. Information on the broiler production, management and marketing limit achieving full potential of the broiler industry. Adequate information on the foregoing will ensure deployment of appropriate technologies to farmers that will scale their level of productivity and contribute significantly to human capital development and livelihood of the broiler producers. The study intends to evaluate demographic and socio-

economic parameters of broiler producers, assess broiler production practices and identify challenges faced by broiler producers in the study area.

## **Materials and Methods**

### ***The Study Area***

Taraba state is bounded by Bauchi and Gombe state on the northern part, Plateau and Nasarawa state on the western part and on the east by Cameroon. The State geographically consists of undulating landscape dotted with few mountains features. Taraba has sixteen local governments area, while Jalingo is the state capital. The study was carried out in Jalingo local government area, Jalingo has an area of 54,473 km<sup>2</sup> and the population of 2,688,944 (FOS, 2004). A population density is two and a half times the national average (NPC, 2010). Both primary and secondary data were used. The primary data were obtained through structured questionnaire, while secondary data were sourced from journals, textbooks, seminars, internet sources and conference papers. The investigation was carried out between June 2018 and July 2019. Jalingo is cosmopolitan in nature, high population density and socio cultural activities. However, records of registered poultry farmers are not available with the Taraba state Agricultural Development Project.

### ***Sampling and Data analysis***

Sixty-two broiler farmers were selected using a snowball method. In this method, the location of other poultry farmers is made possible with the help of first farmer that was interviewed and subsequently other broiler farmers were interviewed. The direct Semi-Structured questionnaire comprising of both open-ended and close-ended questions was used to source for information from broiler farmers on production characteristics and adoption of broiler production technologies. Data sourced from the respondents include demographic, socioeconomic and institutional variables, these variables are age (years) and sex distribution, occupation, educational attainment and experience (years) in broiler production, flock size, household size and marital status (etc.). Further, information on broiler production practices, management and production constraints were sourced from the respondents. Data collected were subjected statistical analysis as frequency, percentages and Chi-Square goodness-of-

fit test using Statistical Package for Software Solution (SPSS version 16 on windows).

### Results and Discussion

Broiler production in the study area is male dominated, distribution by gender showed statistically significant Chi Square goodness-of-fit test (Table 1). High proportion of men in broiler production may be associated with capital and risk involves in production, poultry enterprise is a high risk venture, labour intensive and characterized by uncertainties. Findings agreed with that of Babatunde *et al.*, (2012) and Ojo et al who reported that majority of poultry farmers in Nigeria were males. Broiler producers in the age range of 41 to 50 (61.2 %) are frequently encountered, followed by respondents in the age range from 21 to 30 years (18.4 %). Broiler farmers who are married (63 %) are more in numbers compared to respondents who are singles (37 %). Preponderance of male compared to female in broiler production was reported by Eddington and Mabel (2016), they opined that the majority of the broiler producers were married (78%), with the rest (22%) being widowed, divorced or never married. Broiler production is male-dominated production is not mechanized and family labor remains the only form of labor available. 64.5% of the respondents hold tertiary educational certificate, followed by holders of secondary school certificate (24.2 %). Only 8.1% of broiler farmers had post-secondary qualifications. These categories showed statistically significant ( $P < 0.05$ ) Chi-square goodness of fit test. The preponderance of youths in broiler production is an indication of their interest, aspiration and physical strength required for broiler production. High population of youths will ensure desirability of broiler production technology information that will scale production at the farm level. In another study, Adeyonu *et al.*, (2016) found out that 14% of the poultry farmers in the study area were below the age of 30 years, while about 40% were older than 49 years with mean age of about 44 years. This means that the respondents were fairly old but still economically active. This could be attributed to the need for accessing more income to meet up with family demands. Education is important to access, evaluate and adopt farm technologies. Our respondents are fairly educated to understand basic broiler production practices. Low educational

attainment of broiler growers is an indication of a possible slow rate of adoption of broiler production technologies. This implied that, the respondents have adequate knowledge based to enable them into accessing information on broilers production techniques. The result is in line with that of Ojo (2003) who reported a high literacy rate among poultry farmers in Nigeria.

The household size of 1 and 5 (67.8 %), followed by 6 and 10 (20.90%) are frequently encountered, the categories for household size were significant ( $P > 0.05$ ) as indicated by Chi-square goodness of fit. Broiler farmers are involved in other income generating activities. The household size of human labor is most predominant type of labor available in the form of family, hired or communal. As the growers' access to labor increases, there is a commensurate increase in farm size. This indicates that, the respondents had good household size that could serve as means of labor for the adoption of broilers production techniques. This study is in consonant with Otunaiya *et al.* (2015) who revealed that the average family size of poultry farmers in Ibadan, Oyo state was five. Experience (years) in broiler production ranged from 1 to 20 years, majority of broilers had between 1 and 5 years' experience, followed by respondents with 6 and 19 years. These categories are significantly ( $p < 0.01$ ) different as indicated by Chi goodness-of-fit test. The spread of farmers' experience over years suggest that our clientele are well experienced in broiler production. Experience in broiler production will enhance adoption and reduce the time taking to switching over to new technologies. A large proportion of the respondents are civil servants, followed by the respondents are involved in trading. The majority (70 %) of the broilers farmers are registered members of cooperative societies in the metropolis. The period of membership of cooperative society ranges from 5 to 15 years. Broiler farmers with 2 and 4 years' membership period are in larger proportion, followed by respondents with 5 and 7 years' experience (Table 1). The majority (70.6%) of the respondents are registered members of cooperative societies. Membership of cooperative societies is primarily to provide for funds, agricultural inputs and labor. This could be because association could be avenues for the respondents to access credit which will enable him/her adopt the broilers production techniques. This result corresponds

to that of (Alabi and Haruna, 2005) who revealed close to 75% of the farmers belonged to one or more association such as Poultry Association of Nigeria and cooperative societies.

Additionally, developmental agencies and non-governmental agencies are collaborating with farmers who belong to cooperative societies for dissemination of modern technologies, input and grants. Broiler production is carried out in the open field, while green house or net house production is limited. Membership of cooperative societies is primarily to provide for funds, agricultural inputs and labor.

Additionally, developmental agencies and non-governmental agencies are collaborating with farmers who belong to cooperative societies for dissemination of modern technologies, input and grants. Broiler farmers in Jalingo local government area had little access to extension services (Table 1) and credit. Most farmers source funds from relatives and friends rather from commercial banks. The farmland available for broiler production is either inherited (43%) or hired (56.9%), respondents who owned farmlands are fairly encountered compared to growers who hired farmlands for broiler production.

**Table 1** : Socio economic and demographic characteristics of Broiler producers in Jalingo, Taraba state

Variables	Frequency	Percentage	Df	Chi square	Probability
<b>Gender</b>					
Male	37	60	1	2.32	0.12
Female	25	40			
<b>Age</b>					
Below 20	6	9.7	4	23.81	0.02
21- 30	12	19.4			
31- 40	2	3.2			
41- 50	38	61.2			
50 and above	4	6.5			
<b>Marital status</b>					
Single	23	37	1	4.12	0.04
Married	39	63			
<b>Level of education</b>					
Non formal	2	3.2	3	57.61	0.00
Primary	5	8.1			
Secondary	15	24.2			
Tertiary	40	64.5			
<b>Household Size</b>					
1-5	42	67.8	3	31.67	0.00
6-10	13	20.9			
11-15	3	4.8			
15 and above	4	6.5			
<b>Farming experience</b>					
1-5	39	62.9	3	64.32	0.00
6-10	11	17.7			
11-15	9	14.5			
16 – 20	3	4.8			
<b>Occupation</b>					
Craftwork	12	19.4	3	15.28	0.002
Trading	18	29.0			
Civil servant	32	51.6			
<b>Membership of cooperative society</b>					
Yes	44	71			0.00
No	18	29.0	2	35.80	
<b>Duration of membership of cooperative society</b>					
2 - 4 years	37	59.6	3	10.09	0.02

5 - 7 years	13	20.96			
8-11 years	8	12.90			
	4	6.45			
<b>Frequency of extension contact</b>					
Yes	22	35.48	41.59	0.00	
No	40	64.51	2		
<b>Access to credit</b>					
Yes	20	32.22	1	38.22	0.00
No	42	67.74			
<b>Source of funds received</b>					
Friends	30	48.34	2	33.89	0.00
Relatives	20	32.25			
Commercial bank	12	19.35			
<b>Source of farmland for broiler production</b>					
Hired	27	44	2	2.31	1.01
Inherited	35	56			

### Broiler Production Characteristics

Broiler producers in Jalingo metropolis managed between 159 and 1,400 chickens annually, with 50 and 2,000 broiler chicken per cycle (Table 2). The stock density ranges from 6 to 12 birds per square meter, with mortality rate between 32 and 60 %. Broiler stocking densities depend on weather conditions (heat, cold, humidity and rainfall), type and size of housing and capital. If a farmer over stock his broiler pen, this negatively impact productivity, health and welfare of the birds. In East Africa, 10–12 birds/m<sup>2</sup> or 30 kg/m<sup>2</sup> maximum are frequently encountered (Škrbić *et al.*, 2009). High stocking densities gave the highest economic return per unit floor space, but may have negative effect on general welfare, resulting in reduced economic return per bird (Scanen *et al.*, 2004). On the other hand, too

light stocking densities are not economic for space management and this is associated with reduced growth (Mpofu, 2004). In the study area, stocking density was slightly lower than recommended, ranging from 6 to 12 birds/m<sup>2</sup> with a mean of 8.5 birds/m<sup>2</sup>, and the standard deviation was low (Table 3). Low stocking density in the study is advantageous, farmers use a naturally ventilated, semi-permanent type of housing and therefore the environment cannot be controlled. The range and mean of flock size, batch and stock density indicate that broiler production is carried out on a small scale. Among the respondents, the market age for broilers range between 5 and 9 months, with a market weight of 1.92 to 3.00 kg. Mortality rates were high, with an average 10.2% and ranged 32 to 59.

**Table 2:** Flock sizes and stocking densities among Broiler producers in Jalingo, Taraba state Nigeria

Production characteristics	Range	Mean ± SD
Flock size (broiler birds/year)	159 – 1,400	1100±2,400
Batch (bird/cycle)	50 – 2,000	350 ± 812.4
Stock density (birds/m <sup>2</sup> )	6.00 – 12.00	8.5 ± 2.0
Mortality (%)	32 – 59.00	10.2 ± 4.33
Market age	5 – 9	6.9 ± 0.6
Market weight (kg)	1.82 - 3.00	2.00 ± 0.27

(sawdust) under varied housing systems compared and wire cages (7 %) in broiler management (Table 3). The deep litter system with wood shavings is predominant. In Zimbabwe, Eddington and Kshangura (2016) had noted preference for grass

rather than sawdust in deep litter system is due to the risk of the young chicks eating the sawdust and dying of impaction, raising mortality levels. Respondents used compounded feed (92%), while few purchased concentrates and maize from open market and mixed

with other ingredients. Choice of feed to use was influenced by brand reputation, past experiences with the feed, cost price, nutrient density and market availability. Results show that producers put more emphasis on brand loyalty, feed quality (causing few health problems and low mortality) and performance (weight gains) than cost price in their feed procurement decisions. This is in line with global trends where the focus has been on maximizing production and profit through faster growing birds with improved feed conversion efficiency and marketing at an early age (Scanes *et al.*, 2004). Broiler farmers' source for day old chicks from agro-dealers or marketers compared to friends. This is associated with high risk associated with this business venture. The provision of glucose in water is

widely practiced by broiler producers. In addition, vaccination, management of temperature during brooding and deep litter system is important for growth and development of broilers. Regular provision of clean water and cleaning of the deep litter system are widely practiced by broiler farmers to prevent outbreak of diseases on the poultry house. Disease management in broiler production is important for healthy chickens that give profitable margins (Mirira, 2011). Beside vaccination, sanitation of the poultry house is important to exclude pathogens (Scanes *et al.*, 2004). Some broiler farmers clean brooder houses and deep litter, disinfection followed by resting of the poultry houses (73%) and little attention was given to footbath (19%), and least being restricted area (8%).

**Table 3:** Broiler production units and management in Jalingo, Taraba state Nigeria

Variables	Frequency	Percentage	Df	Chi square	Probability
<b>Broiler management</b>					
Deep litter	58	93	1	23.19	0.01
Wire cages	4	7			
<b>Brooding system</b>					
Construct brooder house	5	8	2	15.43	0.04
Use rooms in the home	30	48.38			
Construct make shift brooder house	27	43.55			
<b>Feed</b>					
Compounded	57	92	1	28.11	0.01
Concentrates mixed with grain	5	8			
<b>Choice of feed</b>					
Brand	32	52	4	23.11	0.03
Past experience	12	19			
Cost price	6	9			
Nutrient density	5	9			
Market availability	7	11			
<b>Source of day old chicks</b>					
Friends	13	79.00	1	15.57	0.004
Agro dealers or marketers	49	20.96			
<b>Supply water and glucose at brooding</b>					
Yes	51	82.25	1	11.77	0.03
No	11	17.74			
<b>Vaccination during brooding stage</b>					
Promptly	50	80.6			
Seldom	12	19.35	1	22.19	0.00
<b>Management of temperature and humidity at brooding</b>					
Yes	56	90.32	1	6.64	0.08
No	6	9.67			
<b>Management of temperature and humidity at deep litter system</b>					
Yes	32	52	1	4.11	0.14
No	30	48			

<b>Clean water and regular cleaning of deep litter system</b>					
Often	48	77	2	34.12	0.02
Seldom	7	11.5			
Not at all	7	11.5			
<b>Sanitary practices</b>					
Foot bath	12	19	2	12.22	0.03
Cleaning and disinfection	45	73			
Restricted area	5	8			

#### **Marketing of broilers in Jalingo, Taraba state**

The majority (82%) of broiler farmers sell live chicken (82%) to the market, dressed whole broiler and cut up chicken parts are least important. Pricing is by feeling the weight (94%) of the broiler (heavy or light). Sales by weight is least encountered. There is no competitiveness in marketing of broilers (live or dressed) and consumers are not breed specific, but are attracted by weight of the live birds. Broilers sales are done in open market. Dressed birds in

supermarkets are not frequently encountered, due inadequate and expensive cold store facilities, more importantly are poor technical knowhow to manage this facility and power outages. More importantly, there is a shortfall between broiler production and market demand, hence little broiler meat are left for storage. With low market demand, the bird continues to eat feed before it is finally sold, impacting negatively on profits. Broilers are put up their birds for sale at 6 weeks (65 %).

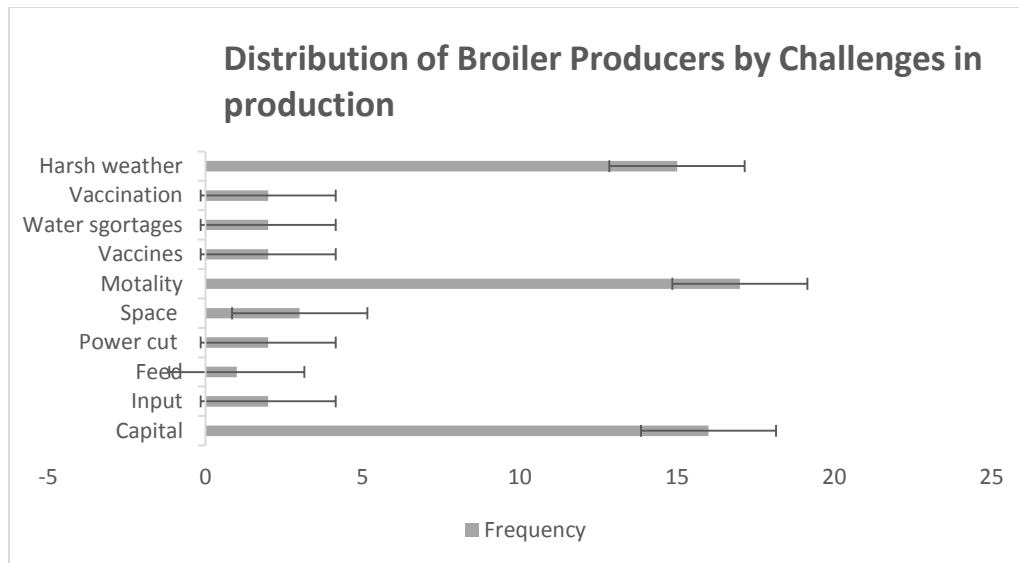
**Table 4:** Marketing of broilers in Jalingo

<b>Marketing of broilers</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Marketing aspects (Broiler sales)</b>		
Live birds	51	82
Dressed whole broiler chicken	9	15
Cut-up chicken parts	2	3
<b>Pricing mechanism</b>		
Per bird	3	5
Feeling the weight	59	95
Per kilo and Bird	0	0
<b>Market arrangement</b>		
Open market	58	94
Contract market	1	1.60
Contract production	3	4.39
<b>Age of marketing</b>		
5 weeks	10	16
6 weeks	40	65
7 weeks	7	11.29
8 weeks	5	8.0

#### **Challenges in broiler production in Jalingo, Taraba state**

Broiler production in Jalingo is constrained by high mortality due to biotic and abiotic diseases (heat and cold stresses). In addition, startup capital is high, and farmers have little or reliable source of credit to commence or support large scale production. Further,

spaces, input, vaccination, water shortages, power cuts and feed moderately influenced broiler production. These constraints alongside others have been responsible for low participation of individuals in broiler production, alongside dearth of large scale broiler farms in Jalingo. Consequently, live broiler at table size raised elsewhere or broiler meat are transported into Jalingo.



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