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Broiler Bird Production Skills Needed by Agricultural Education Graduates for Entrepreneurship in South-East, Nigeria

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Abstract

The general objective of this study was to evolve broiler bird production skills needed by Agricultural education graduates for entrepreneurship in South-East, Nigeria. Specifically, it determined skillsrequired by Agricultural education graduates in broiler bird's production for management of housing, feeding, and health. Survey design was employed for the study. Population was made up of 45 agricultural education lecturers and 3,300 poultry farmers. Data were collected using a structured questionnaire. Data were analyed using mean, standard deviation, and t-test at 0.05 level of significance. Results include 10 skills needed by agricultural education graduates for broiler housing management. These include ability to: set broiler house for different stages of growth ($\overline{X}$=3.45); regulate temperature withn the broiler house ($\overline{X}$=3.23) and others. There were no significant differences in the means of Agricultural education lecturers and farmers for all 10 skills at 0.05 evel of significant. Also 11 broiler feeding management skill were identified, including among others, ability to understand nutritional requirement of broilers at different stages of growth ($\overline{X}$=3.52). Others findings are 11 brioler health management skills, including ability to monitor bird health and behaviour ($\overline{X}$=3.34), and others. Four recommentions were made based on the findings.

Keywords: Broiler, Skills, Housing, Feeding, Health, Management, Agricultural Education, Graduates.

Introduction

Agriculture remains a cornerstone of Nigeria's economy, offering substantial employment opportunities and playing a key role in ensuring food security. It is also a major source of income and livelihood for millions across the country (Ogundari, 2021). Despite its importance, the sector is hindered by several issues, such as low levels of productivity, poor infrastructure, and restricted access to financial resources (Adebayo et al., 2022). Tackling these problems requires empowering graduates of agricultural education with practical skills, especially in broiler bird production.

Broiler birds (*Gallusgallus*) are young chicken either male or female that developed from a hatchweight of between

38 – 40g to a weight of about 1.7kg to 2kg within a period of six weeks which are areared for meat production (Department of Animal Husbandry, Livestock, Fisheries and Veterinary Services, 2013). Broilers can also be referred to as one of the poultry birds reared by man mainly for food and income generation which mature within a period of 6 weeks. Broilerisa potential source of protein to human diet. Okey and Egede (2021) maintained that broiler meat is cherished by most people in Nigeria because of its sweet taste, tenderness and nutritive value. Prabakaran (2013) opined that the meat contains 150 calories per 100g, has less cholesterol than some foods of animal origin, andthe meat's fibre is very tender which makes it easy to chew, grind and digest. Commercial broiler production provides a lot of poultry meat because the birds are raised mainly for large scale meat production (Mbuza et al, 2017).

According to th eauthors, broilers can be produced in a relatively short possible time. Broiler birds' production is a lucrative business in Nigeria, with a high demand for poultry products (Oladimeji et al., 2022). However, the industry faces challenges such as high mortality rate, poor feeding practices, and inadequate management (Esonu et al., 2021). To overcome these challenges, agricultural graduates need to develop adequate skills in broiler birds' production.

Skills are defined as the abilities acquired through practice, experience or training that enable individuals to perform tasks effectively and efficiently in various contexts (Siddique, 2021). Skill acquisition is characterized as the process of obtaining the knowledge and abilities necessary to perform certain tasks effectively; this often involves both educational and practical experiences (Umoh & Ajadi, 2021). In the context of broiler production, skills acquisition is essential for agricultural education graduates who need to grasp both the theoretical underpinnings and practical applications of broiler management. Engaging in hands-on experiences, internships, or workshops can facilitate this acquisition, enabling graduates to start their poultry businesses right after graduation (Higgins, 2022).

The need for agricultural education graduates to acquire skills in broiler bird production is grounded in several compelling reasons, including the growing demand for poultry products, the importance of sustainable farming practices, and the need for innovation in agricultural methods as well as the need to reduce unemployment rate in Nigeria (Food and Agriculture Organization (FAO, 2021). Some of the vital skills required for broiler birds' production include breeding techniques, disease management skills, feeding strategies, housing skills among others. Possessing the above skills would enable agricultural education graduates to develop entrepreneurship in broiler birds' production.

However, despite the importance of skills acquisition in broiler birds' production, many agricultural education graduates from South East, Nigeria lack the vital skills needed for broiler birds' production and other skill areas in agriculture. As a result, many of the graduates are either unemployed or unemployed. The lack of skills among graduates from most Nigeria universities can be attributed to several factors, including inadequate training and education, limited access to finance and resources, and poor policy support

(Adebayo et al., 2022). As a result, many agricultural education graduates are unable to establish and manage successful broiler birds' production businesses, which contributes to the shortage of poultry products and food insecurity in the region (Oladimeji et al., 2022). There is need to inculcate broiler birds' production skills to agricultural education graduates for sustainable broiler birds' production in South-East, Nigeria.

Objectives of the Study

The general objective of the study was to evolve broiler bird production skills needed by agricultural education graduates for entrepreneurship in South-East, Nigeria. Specifically, it determined skillsrequired by Agricultural education graduates in broiler bird production for management of:

1. housing.
2. Feeding.
3. Health.

Hypotheses (HOs)

The following research null hypotheses were tested at 0.05 level of significance:

There is no significance difference in the mean responses of Agricultural education lecturers and poultry farmers on skills required by Agricultural education graduates in South-East Nigeria for broiler bird production for managemen:

HO_1: housing.
HO_2: feeding.
HO_3: health.

Research Methodology

***Design of the Study*:** The study adopted a descriptive survey research design.

***Area of Study*:** The research was carried out in Nigeria's South-East region, which comprises five states: Abia, Anambra, Ebonyi, Enugu, and Imo. Within this region, there are five federal universities, out of which only three offer Agricultural Education programs and were selected for the study. These are: University of Nigeria, Nsukka (UNN); Michael Okpara University of Agriculture, Umudike; and Nnamdi Azikiwe University, Awka.

***Population for Study*:** The total population for this study was 3,345 which consisted of 45 Agricultural Education lecturers and 3,300 poultry farmers from the three states (Abia, Anambra and Enugu) that have federal universities that offer agricultural education programme. The information about the population of Agricultural Education lecturers was obtained from the Office the Secretary of Agricultural Education Department in the three federal universities, while the information on poultry farmers was obtained from the South-East regional office of Poultry Association of Nigeria (PAN) in May, 2024. Agricultural education lecturers are university academic staff who specialize in Agricultural Education programme; and they lecture in the Department of Agricultural Education in various federal universities in the study area. Whereas poultry farmers are individuals engage in poultry birds farming; and they have adequate knowledge, skills and understanding about birds.

***Sample for the Study*:** The sample size for the study was 408, consisting of 45 Agricultural Education lecturers and 363 poultry farmers. All Agricultural Education lecturers were included in the study due to the small and manageable size of their population. For the poultry farmers, a sample of 363 was drawn from a population of 3,300 using Cochran's formula. A purposive sampling method

was employed to select the three federal universities in South-East Nigeria that offer Agricultural Education programmes, while a simple random sampling technique was used to select the respondents for the study.

***Instrument for Data Collection*:** A structured questionnaire served as the tool for data collection. It featured four-point response options: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD), assigned scores of 4, 3, 2, and 1 respectively. The questionnaire was organized into two main parts—Part 1 and Part 2. Part 1 gathered demographic details of the respondents, while Part 2 addressed the three. Part 2 was further segmented into Sections A, B, and C, each corresponding to a specific. The questionnaire underwent face validation by three experts, including two lecturers from the Department of Agricultural Education at UNN and one experienced broiler bird farmer from Enugu State. The reliability of the instrument was assessed using the Cronbach Alpha method. To ensure its effectiveness, thirty-five copies of the validated instrument were trial-tested outside the study area. The collected data were analyzed, and the instrument produced a reliability coefficient of 0.80, confirming its suitability and reliability for data collection.

Data Collection Methods: A total of 408 copies of questionnaires were distributed to respondents (45 Agricultural Education lecturers and 363 poultry farmers) by the researchers and three research assistants. At the end, a total of 384 out of 408 copies of the questionnaires were retrieved and used for data analysis. That included 40 copies from Agricultural Education lecturers and 344 copies from poultry farmers.

Data Analysis Techniques: The data were analyzed using statistical tools such as mean, standard deviation, and the t-test at a 0.05 level of significance. A cut-off mean score of 2.50 was established for interpreting responses to the research questions. Items with a mean score of 2.50 or higher were considered as agreed upon by respondents, while items with mean scores below 2.50 were regarded as disagreed. For testing the hypotheses, the decision criterion was based on the t-test: any null hypothesis with a t-value less than the 0.05 significance level was rejected and deemed significant. Conversely, a null hypothesis with a t-value equal to or above 0.05 was accepted and considered not significant.

Results

Table 1: Mean Responses, Standard Deviation and t-test analysis onSkills Required by Agricultural Education Graduates for Broiler Birds Housing Management

S/N	Broiler Housing Skills	$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_g$	t	R
	Ability to:							
1.	set up broiler house for different stages of growth	3.49	0.74	3.41	0.86	3.45	0.28	A/NS
2.	regulate temperature within the broiler house	3.29	0.71	3.16	0.85	3.23	0.06	A/NS
3.	manage the lighting systems in the broiler house	3.29	0.78	3.23	0.86	3.26	0.49	A/NS

Table 1 continues

4.	manage litter to maintain dryness and reduce ammonia levels	3.28	0.83	3.10	0.79	3.18	0.05	A/NS
5.	implement biosecurity in the broiler house	3.14	0.86	3.12	0.88	3.13	0.80	A/NS
6.	manage the brooding systems to ensure optimal growth	3.10	0.80	3.11	0.83	3.11	0.91	A/NS
7.	manage bird density to prevent stress and promote growth	3.33	0.85	3.21	0.84	3.27	0.17	A/NS
8.	carry out proper waste disposal	3.09	0.86	3.07	0.86	3.08	0.78	A/NS
9.	maintain accurate records in the broiler house	3.22	0.85	3.13	0.88	3.18	0.26	A/NS
10.	provide good ventilation in the broiler house	3.00	0.77	3.02	0.82	3.01	0.08	A/NS
	Overall	**3.22**	**0.80**	**3.15**	**0.84**	**3.19**	**0.38**	**A/NS**

N_1 = Number of Agric. Edu Lecturers = 40; N_2 = Number of poultry farmers = 344; $\bar{X}_1$ = Mean score of Agric. Edu Lecturers; SD_1; = Standard deviation of Agric. Edu Lecturers; $\bar{X}_2$= Mean of score of poultry farmers; SD_2 = Standard of deviation of poultry farmers; $\bar{X}_g$= Grand mean; Df (Degree of freedom) = 382; t = t-test results; R = Remarks (A = Agreed; NS = Non-Significant).

Table 1 shows that the mean scores ($\bar{X}$) for the 10 items ranged between 3.08 and 3.45. Agricultural Education lecturers had a grand mean of $\bar{X}1$ = 3.22, poultry farmers had $\bar{X}2$ = 3.15, and the overall grand mean was $\bar{X}g$ = 3.19. Consequently, all 10 items are skills needed by Agricultural Education graduates for effective management of broiler bird housing. The Table also indicates that standard deviations for each item ranged from 0.71 to 0.88, with an overall standard deviation of 0.84, showing that respondents' answers were closely clustered around the mean and showed consistency. Table 1 also show that all 10 skills had p-values greater than 0.05, with an overall p-value of 0.38 (P > 0.05), indicating no statistically significant differences in mean responses of lecturers and farmers regarding needed for broiler bird housing management. Consequently, the null hypothesis was accepted at 0.05 level of significance.

Table 2: Mean Responses, Standard Deviation and t-test analysis on Skills Required by Agricultural Education Graduates for Broiler Birds Feeding Management.

S/N	Broiler Feeding Management Skills	$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_g$	t	R
	Ability to:							
1.	understand nutritional requirements of broiler birds at different stages of growth	3.49	0.73	3.55	0.76	3.52	0.04	A/S
2.	understand different feed ingredients and their nutritional values of broiler birds	3.02	0.81	3.28	0.79	3.15	0.02	A/S
3.	formulate feeds of broiler birds at different stages of growth	3.33	0.69	3.32	0.80	3.33	0.07	A/NS

Table 1 continues

4..	store and handle feeds to prevent spoilage and contamination	3.08	0.81	3.24	0.79	3.16	0.64	A/NS
5.	develop feeding programmes of broiler birds	3.20	0.81	3.20	0.80	3.20	0.51	A/NS
6.	manage feed intake well to avoid wastage	3.03	0.86	3.19	0.78	3.11	0.55	A/NS
7.	manage feed conversion ratio to improve feed efficiency	3.28	0.75	3.32	0.89	3.30	0.78	A/NS
8.	use feed additives such as antibiotics and probiotics well	3.05	0.76	3.27	0.83	3.16	0.92	A/NS
9.	prevent broiler feed contamination	3.26	0.79	3.28	0.80	3.27	0.95	A/NS
10.	budget and cost feeds to ensure profitability	3.09	0.80	3.33	0.79	3.21	0.77	A/NS
11.	analyze and interpret data on feed consumption, Feed conversion and growth rate	3.04	0.80	3.32	0.79	3.18	0.07	A/NS
	Overall	**3.17**	**0.78**	**3.30**	**0.80**	**3.23**	**0.48**	**A/NS**

N_1 = Number of Agric. Edu Lecturers = 40; N_2 = Number of poultry farmers = 344; $\bar{X}_1$ = Mean score of Agric. Edu Lecturers; SD_1; = Standard deviation of Agric. Edu Lecturers; $\bar{X}_2$= Mean of score of poultry farmers; SD_2 = Standard of deviation of poultry farmers; $\bar{X}_g$= Grand mean; Df (Degree of freedom) = 382; t = t-test results; R = Remarks (A = Agreed; S = Significant, NS = Non-Significant).

Table 2 reveals that 11 items had mean scores ($\bar{X}$) above the threshold of 2.50, with lecturers reporting a grand mean of$\bar{X}_1$ = 3.17, poultry farmers recording $\bar{X}_2$= 3.30, and the overall mean being $\bar{X}_g$= 3.23. Thus all 11 items represent skills required by Agricultural Education graduates for efficient broiler bird feeding management. The Table 2 also shows that the overall standard deviation for Agricultural Education lecturers was 0.78, while poultry farmers had a standard deviation of 0.80, suggesting that responses were closely aligned with the mean and consistent among participants. Table 2 further indicates an overall p-value of 0.48 (P > 0.05), which suggests there was no significant difference in the mean ratings of lecturers and farmers regarding skills necessary for effective broiler bird housing management. As a result, the null hypothesis was accepted at 0.05 level of significance.

Table 3: Mean Responses, Standard Deviation and t-test analysis on Skills Required by Agricultural Education Graduates for Broiler Birds' Health Management

S/N	Broiler Health management Skills:	$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_g$	t	R
	Ability to:							
1.	monitor bird health and behaviour	3.43	0.51	3.25	0.70	3.34	0.02	A/S
2.	recognize signs and symptoms of broiler diseases	3.18	0.76	3.12	0.79	3.15	0.49	A/NS
3.	maintain proper sanitation of broiler house	3.37	0.84	3.27	0.71	3.32	0.18	A/NS
4.	carry out vaccination programme in broiler birds	3.24	0.82	3.15	0.76	3.19	0.29	A/NS

Table 1 continues

5.	prevent disease occurrence in the broiler house	3.22	0.76	3.24	0.81	3.23	0.74	A/NS
6.	diagnose diseases using laboratory tests and other tools	2.33	0.72	2.13	0.76	2.23	0.08	A/NS
7.	carry out common broiler diseases treatment	3.22	0.78	3.26	0.84	3.24	0.05	A/NS
8.	use antibiotic wisely to improve broiler health	3.25	0.72	3.17	0.84	3.21	0.24	A/NS
9.	manage water quality in order to prevent disease	3.24	0.80	3.34	0.82	3.30	0.13	A/NS
10.	communicate with veterinarians when the need arises	3.22	0.77	3.10	0.76	3.16	0.15	A/NS
11.	keep and maintain accurate broiler health records	3.21	0.82	3.33	0.72	3.27	0.14	A/NS
12.	prepare for and respond to disease outbreaks	3.32	0.81	3.21	0.99	3.26	0.17	A/NS
	Overall	**3.18**	**0.75**	**3.13**	**0.79**	**3.15**	**0.22**	**A/NS**

N_1 = Number of Agric. Edu Lecturers = 40; N_2 = Number of poultry farmers = 344; $\bar{X}_1$ = Mean score of Agric. Edu Lecturers; SD_1; = Standard deviation of Agric. Edu Lecturers; $\bar{X}_2$= Mean of score of poultry farmers; SD_2 = Standard of deviation of poultry farmers; $\bar{X}_g$= Grand mean; Df (Degree of freedom) = 382; t = t-test results; R = Remarks (A = Agreed; D = Disagreed, S = Significant, NS = Non-Significant).

Table 3 show that 11 out of 12 items had means ($\bar{X}$) above the cut of point of 2.50; with Agricultural Education lecturers obtaining a overall mean of $\bar{X}_1$ =3.18; poultry farmers obtained overall mean of $\bar{X}_2$ =3.13 and the overall grand mean was $\bar{X}_g$ =3.15. Thus the 11 items are skills required by Agricultural education graduates for effective broiler birds' health management. Table 3 also indicates that the overall standard deviation for Agricultural education lecturers is 0.75 while poultry farmers obtained overall standard deviation of 0.79, Therefore, the respondents were not far from the mean and from one another in their responses. Table 3 further indicates the overall probability value of 0.22 (P > 0.05) which implies that there was no significant difference in the mean ratings of lecturers and poultry farmers on the vital skills required by Agricultural education graduates for effective broiler birds' health management, hence, the null hypothesis was upheld.

Discussion of Findings

Findings of the study include 10 skills required by Agricultural education graduates for effective broiler birds housing management. The skills include among others, ability to: set up broiler house for different stages of growth, regulating temperature within the broiler house, manage the lighting systems in the broiler house, manage litter to maintain dryness and reduce ammonia levels, implement biosecurity in the broiler house. The corresponding hypothesis testing indicates that there was no significant difference (P > 0.05) in the mean ratings of Agricultural education lecturers and poultry farmer's skills. The finding on ability to set up broiler house

for different stages of growth is in line with Esonu et al. (2021) who maintained that a broiler farmer should possess the ability to design and construct broiler houses that meet the needs of the birds. According to Esonu et al. (2021), the design and construction of broiler houses should take into account factors such as ventilation, temperature, and humidity. The result on ability regulate temperature within the broiler house is in support of Adeyemi (2021), who noted that maintaining the proper temperature in broiler bird housing is essential for their health and growth. According to Adeyemi (2021), broiler birds thrive best in temperatures ranging from 18-25°C. Extremes temperature can lead to stress, reduced feed intake, and poor growth rates. Furthermore, the finding on ability provide good ventilation in the broiler house is in alignment with Adebayo et al. (2021) who pointed thatability to manage the ventilation of the broiler house to ensure optimal air quality and remove heat and moisture is very vital in broiler farming. According to According to Ayoola et al. (2021), proper ventilation helps to prevent respiratory diseases and improve air quality for the birds.

Findings on 11 skills required by Agricultural education graduates for broiler birds feed and feeding management, include ability to: understand nutritional requirements of broiler birds at different stages of growth, understand different feed ingredients and their nutritional values of broiler birds, formulate feeds of broiler birds at different stages of growth, store and handle feeds to prevent spoilage and contamination, among other. The corresponding hypothesis shows that significant difference (P > 0.05) does not exist in the mean ratings of Agricultural education lecturers and poultry farmers on the skills. The finding on the ability to understand the nutritional requirements of broiler birds is in support of Esonu et al. (2021) who maintained that broiler farmers should be able tounderstand the nutritional requirements of broiler chickens at different stages of growth. Esonu et al. (2021) also added that broiler chickens require a diet rich in protein, energy, and essential nutrients such as vitamins and minerals. According to Udedibie (2021), meeting these nutritional requirements is essential for achieving high feed efficiency and reducing production costs. Also, the finding on the ability to formulate broiler feeds at different stages of growth support Nwachukwu et al. (2021), who pointed out that broiler farmers should be able to formulate feeds that meet the nutritional requirements of broiler chickens. The finding on ability to use feed additives such as antibiotics and probiotics well is in line with Ojo et al. (2021), who stressed that broiler farmers should be able to utilize feed additives such as probiotics and enzymes to enhance the growth performance and health of broiler birds.

Findings on 11skills required by Agricultural education graduates for broiler birds' health managementinclude, among others, ability to: monitor bird health and behaviour, recognize signs and symptoms of broiler diseases, maintain proper sanitation of broiler house, carry out vaccination programme in broiler birds. The hypothesis related to these findings show no significant difference (P > 0.05) in the mean ratings of Agricultural education lecturers and poultry farmers.

The finding on ability to prevent disease occurrence in the broiler house aligns with Esonu et al. (2021), who reported that the ability to prevent diseases in broiler birds through measures such as vaccination, biosecurity, and sanitation is very crucial for successful broiler birds farming. According to Esonu et al. (2021), vaccination is a critical component of disease prevention in broiler birds, and should be carried out in accordance with the recommended vaccination program. The finding on ability to monitor bird health and behaviour is in conformity Afolabi (2021), who buttressed that broiler farmers must possess the ability to monitor the behaviour and welfare of broiler birds in order to allows for early detection of health issues and ensures humane treatment.

Conclusion

This study emphasizes the need for agricultural education programmes to incorporate broiler bird production skills, enabling graduates to capitalize on emerging opportunities in the poultry industry. By equipping agricultural education graduates with the necessary skills and resources, the graduates can engage in meaningful broiler birds' production after leaving school. Overall, the study underscores the potential of broiler production as a viable pathway for entrepreneurship among agricultural education graduates, enabling them to capitalize on the growing poultry market while promoting rural development. Equipping agricultural education graduates with the necessary broiler bird production skills can enhance their entrepreneurship development in broiler birds farming for sustainable agricultural production and food security in South-East, Nigeria.

Recommendations

Based on the findings, the study recommended the following:

1. Government and tertiary institutions should develop specialized training programmes and workshops focused on building skills in broiler birds production for agricultural education graduates.
2. Government should provide access to resources (financial and material resources) and support networks for aspiring entrepreneurs in the agricultural sector, specifically in broiler birds production.
3. There should be collaboration between academic institutions, government agencies, and industry stakeholders to support entrepreneurship development in the agricultural sector.
4. Government need to promote awareness and advocacy for entrepreneurship development in agribusiness ventures and its contribution to sustainable agricultural production and food security.

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