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Socioeconomic features of geese rearing in randomly chosen local government areas of Oyo State in Southwest Region of Nigeria in Africa

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Abstract: This research documented comprehensive information on the socio-economic characteristics of geese rearing in Oyo State of Nigeria in Africa. A descriptive cross-sectional design was used for this study. Quantitative data were collected using a semi-structured interviewer-administered questionnaire. The study population was geese farmers across the selected local governments in Oyo State. Findings revealed that out of the geese farmers interviewed, most (88.1%) were Yoruba tribe and males (78.3%), while 21.7% were females. More than half of the geese farmers (53.3%) were between 40 and 49 years old and had obtained tertiary education (33.3%). Most of the geese farmers (57.4%) acknowledged they recorded the weight of their male and female geese regularly while 73.7% acknowledged they regulated the light made available for the geese. Many of the interviewed farmers (55.6 %) also reported that they faced challenges during geese reproduction. Respondents' opinions on the major constraints faced in geese production revealed that theft of geese and low profit remain the prime constraints faced while engaging in geese production. This was followed by a Reptile attack, then a high mortality rate. Production taboo and consumption taboo were the fifth and sixth weighted constraints, respectively. It was concluded that geese are raised mostly by male farmers on free range. The greatest constraint for geese farmers were theft and low profit. Geese farmers must therefore improve their production strategies to increase the performance of reared geese and maximize profit.

Keywords: economic characterization; geese production; geese profitability; social characterization.

INTRODUCTION

The lack of adequate high protein food from livestock sources is one of the most severe health issues in developing countries (FAO, 2018). Low protein intake is a major nutritional problem in Nigeria, which causes malnutrition, child mortality, reduced human productivity, and a general weakness of the human body that eventually leads to illness, poor health status, and reduced life expectancy (Mbanasor, 2002). The Food and Agricultural Organization (2018) has revealed the minimum human demand for animal protein to be 35g per head/day to maintain a healthy human life while Nigeria's minimum human demand is reported to be around 5g per head/day consumption, which is considered too low. Despite the relatively large stock of more than 13 million bovine animals, 34 million goats, 24 million sheep, 3.4 million pigs, around 1.7 million domestic rabbits, and 104.3 million local poultry and about 20 million exotic poultry, the meat supply situation in Nigeria remains critical (Baruwa *et al*., 2018; FAO, 2018). Hence, there is need to increase meat production in order to play a part in rescuing the situation. Engagement and commitment of farmers to goose production is one of such ways to enhance poultry meat continuous supply.

Over the years, many countries in the developing world have recognized the importance of

livestock in integrated production systems as it contributes to food security and sustainability as the populations in these developing countries continually increase yearly (Hugo, 1995; FAO, 2013). It has been discovered that neglected species like geese also fit so well into such systems and can easily adapt to humid tropical regions (Buckland and Guy, 2002; Fontana, 2019). Geese can provide meat and eggs from grazing naturally and are less susceptible to infectious diseases than other winged species. According to Buckland and Guy (2002), the lifespan of geese can be more than 20 years once reared and managed properly as it is an easy domestic animal with a cheap yet productive asset. Regarding the history of domestic animals, geese were one of the first few animals to be reared in homes as this practice can be traced to Egypt about 3,000 years ago (Buckland and Guy, 2002). Geese belong to the family Anatidae and they can be found in most regions of the world as they can adapt to both hot and cold climates once provided with shelter and shade. Geese are commonly suited to aquatic areas and marshlands and in warm homes and shallow waterways (Buckland and Guy, 2002; Fontana, 2019).

However, despite the natural adaptability and the protein source geese provide, they have remained a largely neglected species around the world (Fontana, 2019). In recent times, goose farming is mostly practiced commercially in a few European and African countries (FAO, 2013). There is still a general lack of interest in goose production in sub-Saharan Africa, leading to low level of involvement in goose production and low demand for geese meat and eggs in this region. Overall in the tropical region of Nigeria, only few studies have also been conducted using geese as the research animal (Ola *et al*., 2004; Amao and Oluwagbemiga, 2016; Akinbola and Ewuola, 2020; Akinbola *et al*., 2021; Ewuola *et al*., 2022a; Ewuola *et al*., 2022b; Ewuola *et a*l., 2023; Akinbola and Ewuola, 2023a; Akinbola and Ewuola, 2023b; Akinbola and Ewuola, 2024).

Since geese rearing has not been widely adopted in Nigeria, it is therefore expedient to provide research information on the socioeconomic, reproductive, and productive features of geese farming and the constraints encountered. Therefore, this study aimed to assess the socio-economic characteristics of geese farming in randomly chosen local government areas of Oyo State, in the Southwest region of Nigeria in Africa.

MATERIALS AND METHODS

The study area

This study was carried out in Oyo State, which is located in the Southwestern part of Nigeria, Africa. Oyo State was one of the three states formed out of the old Western State of Nigeria in 1976. Ibadan is the capital of Oyo State with a population of over 6 million people making the city the most populous in Oyo State and the third city with the highest population in Nigeria (OSG, 2019). Oyo State consists of 33 Local Governments and 29 Local Council Development Areas (OSG, 2019). The state is mostly dominated by the Yoruba tribe although other tribes are also inhabitants of the city such as the Igbo tribe, Fulani tribe and Hausa tribe (Arifalo and Ayilaran, 2012).

The study was defined in terms of its geographical scope, time scope, and target respondents. The geographical location of the study was Oyo State, and the respondents were geese farmers from Ibadan North, Ibadan South, Akinyele, Ido, Lagelu, and Afijio local governments in Oyo State. The timeframe for the study was 6 months in the year 2021.

Oyo State covers approximately an area of 28,454 sqkm and is ranked 14th by size. The landscape consists of old hard rocks and dome-shaped hills, which rise gently from about 500m in the southern part and reaching a height of about 1,200m above sea level in the northern part. Some principal rivers such as Ogun, Oba, Oyan, Otin, Ofiki, Sasa, Oni, Erinle, and Osun Rivers originate from this highland (Adeogun *et al*., 2017). The city lies entirely in the tropical rainforest zone, however, close to the boundary between the forest and the savanna. Oyo State experiences the wet (from March to October) and dry (November

to February) seasons with a comparatively steady temperature for the whole year and an annual rainfall of 109 days estimated at 1420mm. The mean highest temperature is approximately 27°C with the mean lowest being 21°C and a relative humidity approximated at 75% (Adeogun *et al*., 2017).

Agriculture is the most important source of income for majority of the people of Oyo State and a significant source of internal revenue produced in the state. Regarding poultry farming, there is a good number of large and medium-sized poultry enterprises clustered in Oyo State with at least 60% of all poultry local production in Nigeria is done and clustered around Ibadan, Oyo State (Okai, 2019). There is existence in Oyo State a chapter of Duck Farmers' Association of Nigeria (DAN) (Baruwa *et al*., 2018).

Research design

A descriptive cross-sectional design was used for this study. Quantitative data were collected using a semi-structured interviewer-administered questionnaire.

Study population, sampling technique and sample size

The study populations were geese farmers across the selected local governments in Oyo State, which include Ibadan North, Ibadan South, Akinyele, Ido, Lagelu, and Afijio. Geese farmers who were ill and those, who did not give their consent were excluded from this study. A snowball sampling technique was used to select 60 farmers across Ibadan North (8), Ibadan South (11), Akinyele (14), Ido (6), Lagelu (12), and Afijio (9) local governments in the state in which a

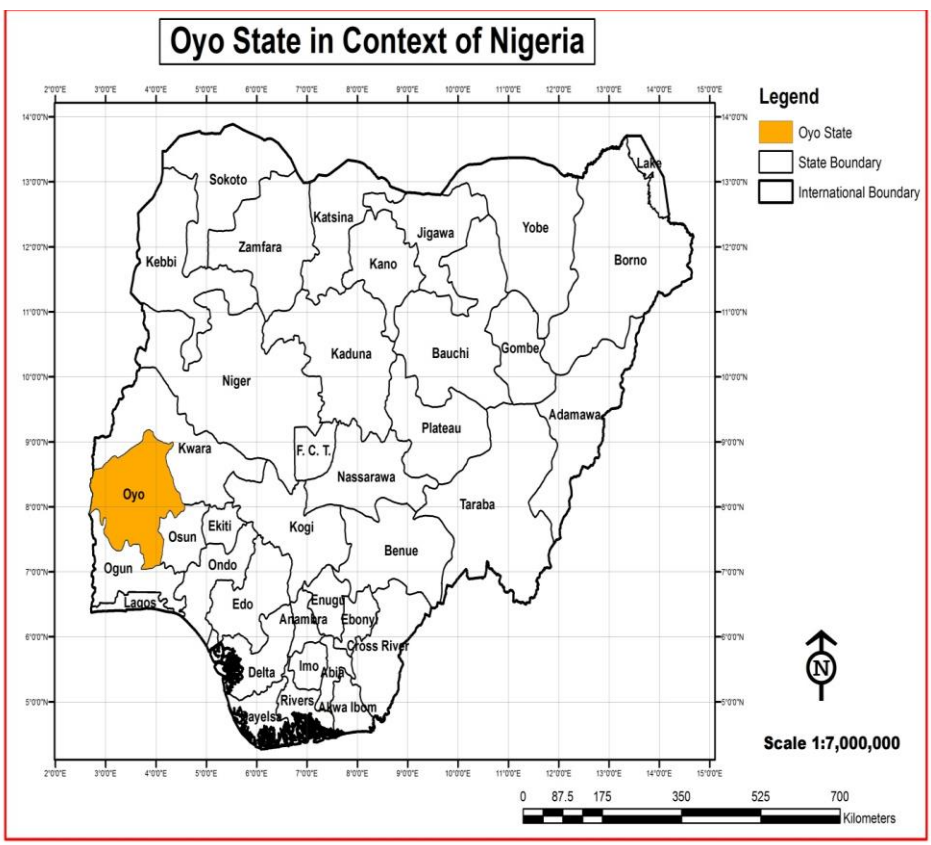

Figure 1. Map of Nigeria showing Oyo State

Source: Google Earth Pro, 2018

structured questionnaire was administered (Table 1).

Data collection, data management and pretesting

In order to achieve the stated objectives, a pretested questionnaire was issued to geese farmers across the selected Local Government Areas in Oyo State. The questions were organized into three sections (1-3). Section one focussed questions related to the socio-demographic background of farmers in the study area; Section two revealed information about the reproductive efficiency of the geese while section three revealed the constraints faced by geese farmers in the selected study area.

The survey questionnaire and in-depth interview guide were pretested to ascertain if they meet the requirements of the study. The enumerators who aided in the administration of the questionnaires and interview guides were trained to ensure the collection of reliable and quality data, and validity and reliability tests were carried out. The reliability value and coefficient were obtained from this analysis which was used to ascertain the statistical reliability of both the survey designs. The survey design was then cross-checked among the enumerators to ensure completeness and consistency of the information collected by subjecting it to a measure of internal consistency using Cronbach's Alpha.

Statistical Analysis

Data collected were analysed using the Statistical Package for Social Scientist (SPSS) version 23. The objectives were achieved using descriptive statistics such as mean, frequency distribution, percentages and inferential statistics (Chi-square Analysis). A categorical ranking method was used to rank ordinal variables. The means for the categorical data were calculated as follows:

Ranks were given depending on the farmers' responses:

For an answer "very common" = 1

For an answer "common" = 2

For an answer "seldom" = 3

For an answer "not at all" = 4

Then the weighted means were calculated.

Means were ranked in an ascending order such that the least mean indicated the most ranked, or highest ranked (1st).

RESULTS AND DISCUSSION

Demographic variables

The socio-demographic characteristics of respondents examined include the gender of farmers, age, level of education, and ethnic group.

Gender

The gender distribution of the geese farmers is shown in Figure 2. The result revealed that most of the geese farmers interviewed were male. In total, 78.3% of respondents were males while the remaining 21.7% were females, indicating that there were more male geese farmers than female geese farmers. This result is not in line with the results from Demir and Elmali (2012) who reported that women dominate geese farming production. The disparity in these results could be due to differences in the study areas where the research was conducted. In the Nigerian cultural setting, farming is mostly practiced by males than females. Suleiman *et al.* (2023) in a study conducted in Nigeria, revealed that 70% of poultry farmers were males while only 30% were females. This report corroborates this study.

Table 1. Distribution showing the number of geese farmers (respondents) in each of the selected areas in Oyo State

Selected Local Government in Oyo State	Ibadan North	Ibadan South	Akinyele	Ido	Lagelu	Afijio
Number of respondents	8	11	14	6	12	9

Source: Data of geese farmers on the socioeconomic Features of geese in local governments of Oyo State, Nigeria

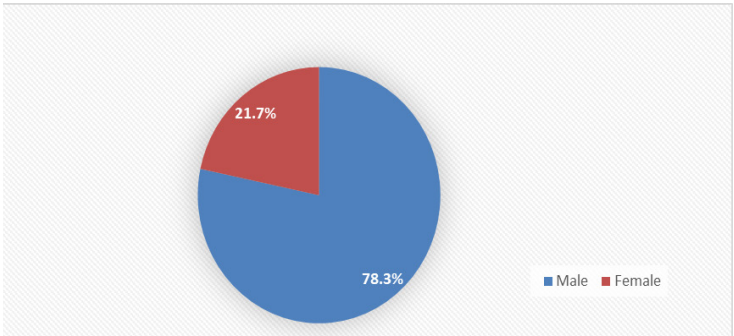

Figure 2. Gender distribution of respondents

Source: Data of geese farmers on the socioeconomic Features of geese in local governments of Oyo State, Nigeria. Own Calculations

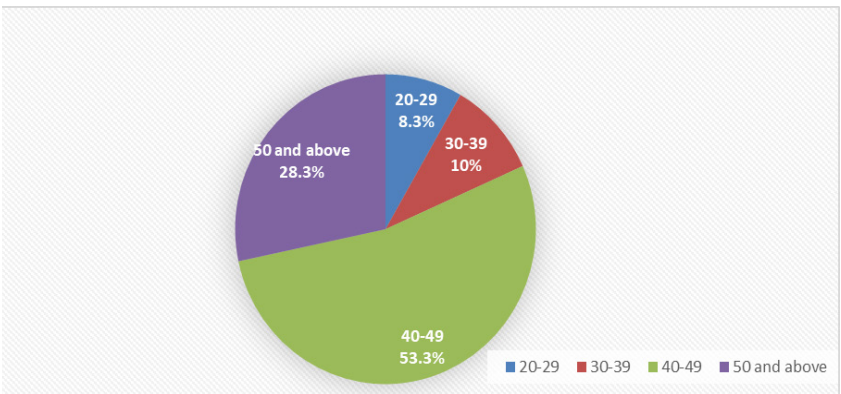

Figure 3. Age distribution of respondents

Source: Data of geese farmers on the socioeconomic Features of geese in local governments of Oyo State, Nigeria. Own Calculations

Age

Age distribution of the geese farmers is shown in Figure 3. It was revealed that the many of geese farmers (53.3%) had their ages between 40 and 49 years. Some of the respondents (28.3%) were 50 years and above; a few of the geese farmers (10%) had their ages between 30 and 39 while only 8.3 % of the respondents had their ages between 20 and 29. A critical look at the breakdown of geese farmers' ages showed that most of the geese farmers are elderly, with a lot of farming experience.

The result on the age of geese farmers showing critically that geese farmers are mostly elderly with a lot of farming experience corroborates with the findings of Okoli *et al.* (2005), who reported that many poultry farmers have been in the farming business for a long time.

Level of education

The level of education of geese farmers is presented in Figure 4. The result revealed that the majority of the geese farmers had tertiary education. One-third of geese farmers (33.3%) reported they had a tertiary education. Some of the geese farmers (30%) reported they had secondary school education. These results agree with the findings of Okoli *et al.* (2005) who posit that the acquisition of post-primary education plays a good role in the poultry farming business. One-quarter of the respondents (25%) reported they

had only primary school education, while a few of the respondents (11.7%) reported they had no form of formal education.

Ethnic group

The ethnic group of geese farmers is shown in Figure 5. The result revealed that the majority of the farmers (88.1%) were Yoruba tribe, 8.5 % of the respondents were Igbo tribe, 1.7 % of the respondents were Hausa tribes, while the remaining 1.7 % of the respondents were from other unknown ethnic groups. The reason associated with the high amount of respondents being Yoruba could be a result of the locations selected for the study, which was in the Southwest region of Nigeria, densely populated with Yoruba tribes.

Reproductive efficiency of geese production

Table 2 presents the reproductive efficiency of geese production based on whether they engage in geese reproduction; challenges faced with geese reproduction; numbers of geese in the farm; number of gander in the farm; record of the weight of geese and gander; exposure to daylight.

Engagement in Geese breeding

Most of the interviewed farmers (79.6%) reported that they engaged in geese breeding while the remaining respondents (20.4%) did not engage in it. Similarly, Stiles (2017) argued that the domestication and breeding of poultry birds, which geese are part of, is basically because of humans' need for meats and eggs. The study observed that farmers engage majorly in geese production and breeding for sale and consumption. Unlike Stiles (2017), this study revealed another purpose associated with farmer's desire, to engage in geese

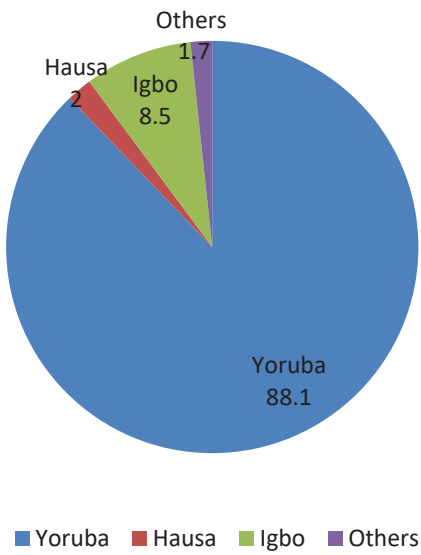

Figure 5. Distribution showing the ethnic group of respondents

Source: Data of geese farmers on the socioeconomic Features of geese in local governments of Oyo State, Nigeria. Own Calculations

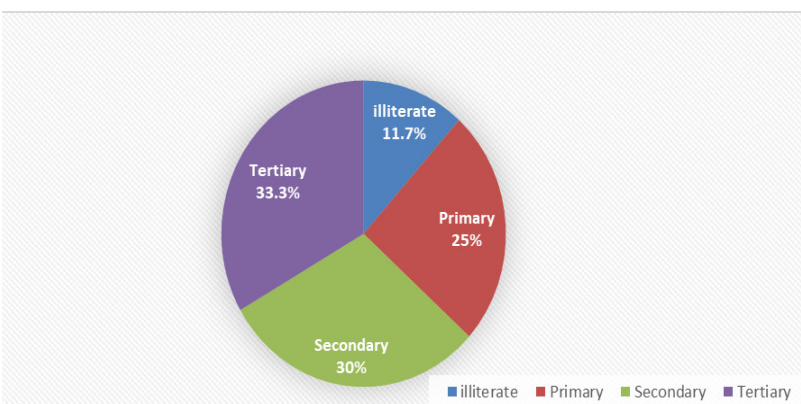

Figure 4. Distribution showing respondents' level of education

Source: Data of geese farmers on the socioeconomic Features of geese in local governments of Oyo State, Nigeria. Own Calculations

production and breeding and it is the need to use the geese for research purposes.

Challenges faced in geese breeding

Most of the farmers (55.6 %) reported they faced challenges during geese reproduction while the remaining respondents (44.4%) did not encounter any challenge in geese reproduction. The presence of challenges has a huge tendency to reduce the reproductive efficiency of geese production. Large-scale geese production is limited by their characteristic poor semen quality, low egg fertility, sexual behavioral demand of preferential mating or pairing, and seasonal breeding (Lukaszewicz, 2010).

Number of geese on the farm

More than one-third of the respondents (37%) reported they had less than 10 geese and 37% also had 21-30 geese on their farmlands. A few of the respondents (18.6%) claimed they had 11-20 geese on their farmlands. The remaining farmers (7.4%) claimed they have more than 30 geese on their geese farm. An increased presence of geese leads to an increase in reproduction efficiency due to an increase in egg production.

Numbers of genders (male geese) on the farm

The presence of male geese (ganders) on the farm was also another way the study measured reproductive efficiency. The result revealed that the majority of the interviewed geese farmers (46.3%) reported they had less than ten (10) ganders on their farms; 27.8 % of the respondents stated they had twenty-one (21) to thirty (30) ganders; 20.3% of the respondents claimed they had about 11-20 ganders on their farms. The remaining respondents (5.5%) reported they had more than thirty ganders on their farms.

Weight record of geese and gander

The majority of the geese farmers (57.4%), acknowledged they recorded the weight of their geese and gander, while the remaining respondents (42.6%) did not. According to Stiles (2017), it is important to know the weight of the geese as it reveals their reproductive capacity. The more knowledge farmers have about the weight of their animals, the more reproductive efficiency.

Regulation of geese exposure to light

The majority of the respondents (73.7%) claimed they regulated the light made available for the birds while the remaining respondents (26.3%) stated they did not regulate their birds' exposure to light. Regarding exposure to daylight, geese farmers reportedly exposed their geese to a long period of daylight. Mihok *et al.* (1996) reported similar findings and attributed the need for these geese to get a certain amount of heat and light, to have a proper metabolism, especially in their first three (3) to four (4) weeks of life.

Constraints faced by geese farmers

Respondents' opinions on constraints faced in geese production were presented in Table 3, which revealed the means of the constraints Respondents' opinions on the major constraint faced in geese production revealed that theft of geese and low profit remain the prime constraints faced while engaging in geese production. This was followed by a Reptile attack, then a high mortality rate. Production taboo and consumption taboo were the fifth and sixth-ranked constraints, respectively. The results above ranked the constraints faced in geese production in ascending order, viz: theft (1st), low profits (2nd), reptile attack (3rd), high mortality (4th), production taboo (5th), and consumption taboo (6th).

Based on the result, most of the geese farmers considered theft and low profit, as the first two prime constraints faced, while engaging in geese production. Theft may be a rampart for geese production in the study area since they are less common and the little once available are more expensive than many other poultry species. Also, low profit from geese business might be attributed to goose breeding difficulty and inefficiency. Reproductive efficiency in the goose specie is quite complicated because of their special sexual behavior and physiology (Lukaszewicz, 2010; Lukaszewicz *et al*., 2017). In the case of natural mating, problems associated with it include the

Table 2. Reproductive efficiency in geese production

Reproductive efficiency	Frequency (N)	Percentage (%)
If they engage in geese		
Yes	43	79.6
No	11	20.4
No response	6	
Challenges with geese reproduction		
Yes	30	55.6
No	24	44.4
No response	6	
Numbers of geese in the farm		
<10	20	37.0
11-20	10	18.6
21-30	20	37.0
31 above	4	7.4
No response	6	
Numbers of gander in the farm		
<10	25	46.3
11-20	11	20.4
21-30	15	27.8
31 above	3	5.5
No response	6	
Record of weight of geese and gander		
Yes	31	57.4
No	23	42.6
No response	6	
Regulation of birds' exposure to day light		
Yes	42	73.7
No	15	26.3
No response	3	

Source: Data of geese farmers on the socioeconomic Features of geese in local governments of Oyo State, Nigeria. Own Calculations

heavy body weight of the male, compared with the female, which usually leads to inadequate cloaca contact. Some other problems include low semen quality, male leg disorder and copulatory organ malformation and malfunction. The results from this study where low profit was marked one of the highest constraints faced by geese farmers was also in line with the findings of Demir and Elmali (2012) as they also highlighted low profit as one of the major constraints faced in geese farming, according to their study.

Moreover, majority of geese rearers in rural areas, leave their geese to scavenge on their own, making them more predisposed to reptile attacks and high mortality rate. Wilson and Yilmaz (2013) reported that goose production is almost entirely free-range, backyard type and almost all production is for home consumption. Demir and Elmali (2012) who concentrated on revealing the constraints faced in geese production also revealed that the mortality rate among geese is high up to 8.7%. Production taboo in geese enterprise is possible since production of geese in Nigeria and in most African countries is basically at the rudimentary stage of low awareness. Geese are largely neglected specie around the world, and geese rearing is practiced commercially in few African regions (Fontana, 2019; FAO, 2013). Consumption of geese meat also followed the same trend of lower rate just as production. Hence, adoption

Table 3. Constraints faced in geese production by geese farmers

Constraint faced	Frequency (N)	Percentage (%)	Means	Rank
Production Taboo			3.79	5th
Seldom	12	21.1		
Not at all	45	78.9		
No response	3			
Consumption Taboo			3.82	6th
Common	1	1.8		
Seldom	8	14		
Not at all	48	84.2		
No response	3			
Theft			3.39	1st
Very common	2	3.5		
Common	5	8.8		
Seldom	19	33.3		
Not at all	31	54.5		
No response	3			
Low Profit			3.41	2nd
Very common	4	7.1		
Common	4	7.1		
Seldom	13	23.2		
Not at all	35	62.5		
No response	4			
High Mortality			3.64	4th
Common	1	1.8		
Seldom	18	32.1		
Not at all	37	66.1		
No response	4			
Reptile Attack			3.61	3rd
Common	2	3.5		
Seldom	18	31.6		
Not at all	37	64.9		
No response	3			

Source: Data of geese farmers on the socioeconomic Features of geese in local governments of Oyo State, Nigeria. Own Calculations

Table 4. Chi-square association between sex of geese farmers and the number of geese in the farm

Sex of the Farmers	Number of Geese on farm				$\chi 2$	Df	P-value
	>10	11-20	21-30	31 and above			
Male	17	9	13	4	4.681	3	.197
Female	3	1	7	0			

Source: Data of geese farmers on the socioeconomic Features of geese in local governments of Oyo State, Nigeria. Own Calculations

Table 5. Chi-square association between level of education of geese farmers and the number of geese in the farm

Sex of the farmer	Number of Geese on farm				χ^2	df	P-value
	>10	11-20	21-30	31 and above			
Illiterate	3	1	1	0	6.404	9	0.699
Primary	3	2	8	1			
Secondary	6	2	6	2			
Tertiary	8	5	5	1			

Source: Data of geese farmers on the socioeconomic Features of geese in local governments of Oyo State, Nigeria. Own Calculations

level of geese consumption and production is still low.

Table 4 shows the cross tab association between the sex of geese farmers and the number of geese on-farm as a measure of reproductive capacity. The descriptive result revealed that the distribution between the sex of geese farmers and the number of geese possessed was not significant. The chi-square value for this association was 4.681 and the degree of freedom was 3. The p-value of the association was 0.197 which means that the association between both variables was not significant. With the p-value, the null hypothesis which stated that the socioeconomic character of geese farmers (sex) does not significantly influence their reproductive efficiency (number of geese on the farm) was upheld as both variables did not depend on one another.

CONCLUSION

Geese production is seldom practiced by few farmers, mostly to sell or consume them. Most of the geese farmers have just between ten (10) and thirty (30) geese on their farmlands in Nigeria. Relatively, it is easy to start rearing geese, but it is difficult to maintain over a long period due to some constraints, which are essentially centered on theft and low profit due to difficult breeding efficiency. Other related constraints are reptile attacks, high mortality, production and consumption taboo. At present, these constraints have prevented a lot of farmers from majoring in geese farming. Ways of averting these challenges need to be developed through further research so that more farmers can venture into the geese production business. Geese farmers also need to improve their production strategies to increase the performance of reared geese and maximize profit.

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