Evaluation of local duck production systems in Imo and Abia States of Nigeria

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A study was conducted to evaluate local duck production systems in Imo and Abia States of Nigeria. Seventy-two (72) local duck farmers from both States were purposefully selected using snowball sampling techniques and were interviewed using structured questionnaires. Data on farmers' socio-economic characteristics and production practices were collected and analyzed using descriptive statistics such as frequencies, percentages and charts. The results showed that there were more male duck farmers (88.89%), while the average age of duck farmers was 51.35 years. Most (97.22%) of the duck farmers were literate, 58.33% of households had between 4 - 7 members, 73.61% of duck farmers were christians and a higher number (46.43%) raised pigs alongside of ducks. Most farmers (98.61%) kept only Muscovy ducks. The average flock size is about 6-9 ducks per household. Ducks were mainly kept for rituals and traditional medicine (56.78%). About 48.61% of farmers used personal money to finance duck farming, while 47.22% of farmers inherited their foundations stock. The age at sexual maturity for ducks was 7 to 9 months; clutch length was 11 to 15 days, while clutch size ranged from 16 to 20 eggs. Again, 94.44% of farmers practiced extensive system of duck keeping while 84.72% did not provide supplementary feeds to their ducks. Accidents are the leading cause of mortality in ducks, while the myths that surround ducks are the main obstacle to duck meat consumption. The results showed that duck farming is not popular in the study area and therefore, ducks are seen and kept as sacrificial birds. Thus, the potential of ducks for the production of meat and eggs is not fully exploited. These myths that have hindered the production of ducks could be dispelled through farmer trainings and enlightenment.

Keywords: duck, myth, production, conservation

Introduction

In Nigeria, chickens have received much more awareness than any other poultry specie and equally popular in the poultry egg and meat segment. Ducks are a crucial element of various human societies around the world and can be an alternative to chicken in egg and meat production while at the same time, increase dietary protein intake of an average Nigerian to the standard recommended by the United Nations Food and Agriculture Organization

(FAO) (Ige *et al.*, 2014). Local ducks perform well in a scavenger system because they have an exceptional ability to feed on materials that are neither useful to humans nor can be salvaged by chickens and other domestic animals (Banga-Mboko *et al.*, 2007). These ducks are also more resistant to diseases than chickens and are very promising among native poultry species because of their relatively fast growth rate and the high weight of dressed drakes (Duru *et al.*, 2006). However, its production has

been hampered by the myths, taboos and cultural beliefs that surround it. Ducks are part of the prejudiced, less exploited and underutilized poultry species in Nigeria despite their inherent potential for meat and egg production. Its declining numbers in recent years further prove that this bird has been neglected in terms of production and conservation (FAO, 1999; Oguntunji, 2013). Again, due to their scavenging feeding habit, ducks have also been erroneously indicted by the uneducated and ill-informed populace for having a high load of internal worms thereby discouraging its production and consumption.

Currently, the exact production potential of local ducks in southeastern Nigeria remains unknown (Okeudo *et al.*, 2003) and therefore needs to be studied in order to generate the information needed for improvement studies. To improve the production potential of the duck, its production environment must be well understood. Therefore, this study aimed to evaluate local duck production system in Imo and Abia States of Nigeria with a view to providing relevant information to improve the production and conservation of these ducks.

Methodology

The study was conducted in Imo and Abia States of Nigeria. The area is located in a lowland area of the agro-ecological zone of Nigeria's rainforest at latitude 5°45'N and longitude 8°30'E. Imo State has an average annual rainfall which varies from 1980 to 2700 mm. Mean annual minimum and maximum temperatures range from 19°C to 24°C and from 30°C to 35°C, with an annual relative humidity of up to 90% during the rainy season (NBS, 2010). Abia State has an annual rainfall of 2177mm per annum, with a relative humidity of about 50-90% and temperature

range of 22°C – 36°C (Meteorological Station, NRCRI, Umudike, 2018). Two agricultural zones in each State and three Local Government Areas in each agricultural zone were selected on purpose. Due to the non-popularity of duck farmers in the region, the snowball sampling method was adopted: duck farmers were identified by asking other duck farmers to give references to other duck farmers they know (Nyoni and Masika, 2012). Thus, a total of seventy-two duck farmers were interviewed for this study. A simple structured questionnaire was designed to obtain correct information from farmers about their duck production practices. Farmers were interviewed individually, and the data were collected using the survey questionnaire. The data were subjected to descriptive statistics such as frequencies, percentages, graphs and averages using statistical software for the social sciences (SPSS 2010).

Results and discussion

Socio-economic characteristics of duck farmers

The socioeconomic characteristics of duck farmers are presented in Table 1. Male duck farmers accounted for 88.89% of the total duck farmers. The low participation of women in this study may be due to the myths and taboos surrounding duck production in the region. This observation is consistent with the findings of Banga-Mboko *et al.* (2007) and FAO (2009a; 2009b), Alfred and Agbede (2012) in southwestern Nigeria, who reported a high number of male duck farmers compared to women. In a contrary study, Ogah and Momoh (2013) reported that women were the main custodians of ducks in north-central Nigeria.

Table 1: Socio-economic characteristics of duck farmers

Parameters	Farmers (%) (N=72)		
	Imo	Abia	Average
Sex			
Male	83.33	96.67	88.89
Female	16.67	3.33	11.11
Educational level			
No schooling	2.39	3.33	2.78
Primary	33.33	40.00	36.11
Secondary	52.38	43.33	48.61
Tertiary	11.90	13.33	12.50
Age			
31 -40	11.90	0.00	6.94
41 – 50	28.57	20.00	25.00
51 – 60	50.00	76.67	61.11
61 and above	9.52	3.33	6.94
Mean age			51.35
Household size			
1 -3	2.38	3.33	2.78
4 -7	54.76	63.33	58.33
8 -10	30.95	26.67	29.17
>10	11.90	6.67	9.72
Religion			
Christianity	80.95	63.33	73.61
Islam	0.00	0.00	0.00
Traditionalist	9.53	6.67	8.33
Others	9.52	30.00	18.05
Farmers occupation			
Farming	45.23	66.67	54.17
Trading	21.43	10.00	16.67
Civil servants	9.53	6.67	8.33
Others	23.81	16.66	20.83

Most farmers (61.11%) were aged between 51 and 60 years of age, while the average age of duck farmers was 51.35 years. This observation was consistent with the findings of Banga-Mboko *et al.* (2007) and Ogah and Momoh (2013) that reported duck farming to be more common among middle-aged people. The ages of farmers recorded in this study were not favorable for the production and conservation of ducks, this is because the risk-taking abilities, ability to be innovative and the mental capability to cope with the daily challenges and demands of duck management

decreases with age. The level of literacy among farmers indicates that 97.22% of them can read and write. This result is important for the improvement and conservation of ducks as education and training are essential to improve the ability of farmers to understand and accept technological innovations that will eventually lead to increased and sustainable production of ducks (Nwaru, 2001). Most duck farmers (58.33%) had a household size of 4-7 members. This observation is consistent with the findings of Ogah and Momoh (2013) and Okoil *et al.* (2004)

Evaluation of local duck production systems in Imo and Abia States of Nigeria

reported an average household size of 4-7 members among North Central duck farmers and poultry farmers in Nigeria, respectively. The dominant religion recorded was Christianity (73.61%) and, although Christianity was popular, duck production was still surrounded by myths, folklore and taboos that portrays the duck mainly as a sacrificial bird used for cultural purposes, traditional medicine, burials and

spiritual purification (Oguntunji and Ayorinde, 2014). The majority of duck farmers (49.26%) raise pigs alongside ducks. This result corroborates the findings of FAO (2009a) that reported 53.3% of duck farmers also keep pigs alongside ducks. This implies that duck farmers who raised pigs alongside ducks, do not need to provide their ducks with supplementary feeds because pig waste serves as both feed and wallow for ducks (Fig. 1).

Fig. 1 Distribution of duck farmers according to their livestock inventory

Distribution of breeds, sources of funding and stock of duck breeders

Results for the distribution of breeds, sources of finance and basic stocks in the Imo and Abia States are shown in Table 2. The most predominant local duck breed found in the study area is the Muscovy duck. This result corroborates previous reports by Kadurumba *et al.* (2015); Oguntunji (2013); Udedibie and Ogbonna (2006); Duru *et al.* (2006); Etuk *et al.* (2006) that reported the

Muscovy ducks as the most popular duck breed in Nigeria. The prevalence of these breed of ducks as recorded in this study may be due to their adaptation to the environment and their acceptance by the people. Again, while majority of duck farmers inherited (47.22%) or bought (43.06%) their foundation stocks, none of the farmers got theirs through donations of ducks or eggs as applicable among chicken farmers (Mogasse, 2007)

Table 2: Breed distribution, sources of finance and foundation stock of duck farmers

Parameters	Farmers (%) (N=72)		
	Imo	Abia	Average
Breed			
Muscovy	100.00	96.67	98.61
Others	0.00	3.33	1.39
Sources of foundation stock			
Inherited	42.86	53.33	47.22
Purchased	40.47	46.67	43.06
Others	16.67	0.00	9.72
Source of finance for duck farming			
Farm sales	26.19	36.67	30.56
Personal money	50.00	46.67	48.61
Financial institutions	0.00	0.00	0.00
Others	23.81	16.67	20.83

This suggests that ducks are not popular in the study area and could possibly be the reason for the low number of duck producers in the study area. This result contradicts the practice among chicken farmers who obtain their basic stock by donating live chickens, hatched eggs and purchases (Mogasse, 2007), thereby raising and increasing the number of chickens, so that even when farmers cannot afford to buy or inherit birds, they are always encouraged to keep the birds they have received as gifts. In addition, while some duck farmers (48.61%) use their personal money to finance their duck rearing, others come from sources such as family members, friends and loans from co-operatives and savings companies. None of the farmers in the either of the States got their funding from financial institutions, because such opportunities do not exist for smallholder farmers. However, when such opportunities exist, the lending process is so cumbersome that farmers are discouraged and reluctant to turn to such financial institutions for loans or subsidies.

Flock size, duration and purpose of the duck

As shown in Table 3, the average herd size ranged from 6 to 9 ducks. The small flock

sizes observed in this study suggest that ducks are kept on a very small scale and are seen as less important when compared to other poultry and farm animals in the study area. This report, however, contradicts the findings of Morduzzaman *et al.* (2015) who reported the availability of large-scale commercial duck farms with flock sizes ranging from around one hundred to more than a thousand ducks in Bangladesh. Majority of the duck farmers (43.06%) have kept ducks for as long 3-5 years and this years of experience is extremely beneficial for improving duck production and conservation because agricultural skills could be associated with improvements in farmers' production activities. The years of experience of a duck farmer also provide an indication of the practical knowledge he has gained over the years on how he can overcome the challenges associated with duck farming. Ducks were mainly kept for religious rituals, burials and traditional medicine (56.78%). These ducks could be seen scavenging around in several market squares and in the houses of great traditionalist who believe that the duck is a very “powerful bird” and employ them for spiritual purposes.

Table 3 Flock size, duration and purpose of duck keeping

Parameters	Duck farmers (%)		
	Imo	Abia	Average
Flock size			
1-5	19.05	23.33	20.83
6-9	50.00	46.67	48.61
>10	30.95	30.00	30.56
Duration of duck keeping (years)			
1-2	19.05	20.00	19.44
3-5	28.57	16.67	43.06
>5	52.38	63.33	37.50
Purpose of duck keeping			
Income	56.72	56.86	16.96
Consumption	17.91	13.73	16.10
Rituals and traditional medicine	14.93	19.61	56.78
Others (pets, gifts etc)	10.45	9.80	10.16

Evaluation of local duck production systems in Imo and Abia States of Nigeria

Reproductive performance of local ducks

Results on the breeding performance of local ducks in this study are presented in Table 4. Ducks (Male and female) reached sexual maturity between 7 and 9 months of age. The age at sexual maturity of ducks reported in this study is consistent with the findings of Oguntunji *et al.* (2015) in western Nigeria; Nwanta *et al.* (2006) in Northern Nigeria; Ola (2000) in southeastern Nigeria and Ogah and Momoh (2013) in north-central Nigeria, each reporting that the age of the first egg in ducks was 7 to 8 months and that sexual maturity was reached between 6 and 8 months for ducks. Age at sexual maturity and season would be affected by the type of management system practiced by farmers (Etuk *et al.*, 2006). Clutch length ranged from 11 to 15 days, with the number of clutch per year varying between 1 and 2 clutch per year. The average clutch size was between 16 and 20 eggs per clutch. The average number of ducklings per hatch

ranged from 11 to 15 or more, while the number of ducklings surviving to adulthood ranged from 1 to 5 ducks. Ducks having 3 or more cycles per year may be due to early weaning of ducklings, poor maternal ability, and/or environmental changes (Oguntunji *et al.* 2015). This result corroborates previous studies by Nwanta *et al.* (2006); Etuk *et al.* (2011); Chia and Momoh (2012); Banga-Mboko *et al.* (2007) and Adeyemi *et al.* (2008) that reported laying sizes of between 16 and 20 eggs, while Oguntunji and Ayorinde (2015) reported laying sizes of between 3 and 30 eggs. The small clutch sizes reported in this study may be due to a variety of reasons, such as egg theft, predator attacks, seasonal variations, and poor management practices (Oguntunji and Ayorinde, 2015). The small number of ducklings that can survive to adulthood may be due to lack of supplementary feeding, zero vaccination, and lack of shelter for ducks, exposing ducks to predation.

Table 4: Reproductive performance of local ducks

Parameters	Duck farmers (%)		
	Imo	Abia	Average
Age at sexual maturity (month)			
4 -6	14.29	16.67	13.89
7 -9	61.90	60.00	61.11
>10	23.81	26.67	25.00
Clutch length (days)			
1 -5	4.76	3.33	4.17
6-10	21.43	16.67	19.44
11- 15	38.10	43.33	40.28
>16	35.71	36.67	36.11
Number of clutches per year			
1 – 2	88.10	80.00	84.72
3 – 5	11.90	20.00	15.28
Average clutch size			
5 -10 eggs	9.52	13.33	11.11
11 -15 eggs	26.19	33.33	29.17
16 -20 eggs	61.90	50.00	56.94
>20 eggs	2.38	3.33	2.78
No of ducklings per hatch			
1 -10	28.57	30.00	29.17
11 -15	59.52	53.33	56.94
>16	11.90	16.67	13.89
No of ducklings surviving to adulthood			
0 – 5	57.14	66.67	61.11
5 – 10	33.33	23.33	29.17
>10	9.52	14.29	9.72

Management and feeding practices of duck farmers

The extensive system of management was predominant in the study area (Table 5) as there were no form of housing or shelter provided for ducks and most duck farmers (94.44%) do not feel that housing is needed for ducks and have achieved better results they have the opportunity to do excavations. Several authors (Adeyemi *et al.*, 2008, Duru *et al.*, 2006 and Ugbomeh, 2002) also reported that the extensive management system was the most prevalent management

system practiced by local duck producers in Nigeria. Most of the farmers (84.72%) did not provide supplementary feed for their ducks, as these ducks are believed to be able to fend for themselves and that providing supplementary feeds amounts to waste of scarce resources. This contradicts the findings of Banga-Mboko *et al.* (2007), Oguntunji and Ayorinde (2015) and FAO (2009a) that reported a semi-scavenging system of duck keeping where supplementary feeds were provided during the day and shelter at night.

Table 5: Management and feeding practices of duck farmers

Parameters	Duck farmers (%)		
	Imo	Abia	
Management system			
Extensive	100.00	86.67	94.44
Semi-intensive	0.00	10.00	4.17
Intensive	0.00	3.33	1.39
Provision of pool			
Yes	11.90	6.67	9.72
No	88.10	93.33	90.28
Provision of drinking water			
Yes	61.90	63.33	62.50
No	38.10	3.67	37.50
Supplementary feeding			
Yes	4.76	30.00	15.28
No	95.24	70.00	84.72

Health and disease control practices for duck farmers

The disease and health control practices for local duck farmers (Table 6), shows that ducks rarely fall sick while majority of them (56.94%) treat their sick ducks using traditional leaves and herbs (ethno-veterinary), some (6.94%), kill and consume sick ducks while others (23.61%) sell their sick ducks. Farmers (12.50%) who do nothing when their ducks are sick do not know about drugs to treat duck diseases.

This observation is consistent with the findings of Oguntunji *et al.* (2015) and Nyoni and Masika (2012) who reported using ethno-veterinary drugs to treat ducks and/or prevent disease, and it is a widespread practice among duck farmers. Furthermore, all the duck farmers (100%) in the study area have never vaccinated their ducks and neither do they have access to veterinary or extension services. This could be attributed to lack of awareness of the availability of duck vaccines on the part of the farmers.

Evaluation of local duck production systems in Imo and Abia States of Nigeria

Table 6: Health and disease control practices among duck farmers

Parameters	Duck farmers (%)		
	Imo	Abia	Average
How often do ducks fall sick			
Rarely/don't fall sick	92.86	83.33	88.89
Occasionally	7.14	16.67	11.11
Handling of sick ducks			
Treat sick ducks	52.38	63.33	56.94
Kill and consume	7.14	6.67	6.94
Do nothing	16.67	6.67	12.50
Sell sick ducks	23.81	23.33	23.61
Vaccination of ducks			
Yes	0.00	0.00	0.00
No	100.00	100.00	100.00
Access to veterinary services			
Yes	0.00	0.00	0.00
No	100.00	100.00	100.00

Accident from vehicles was identified as the primary cause (45.45%) of mortality in ducks, as shown in Figure 2. Indeed, the extensive rearing system associated with the slow movement of ducks exposes them to death by careless motorists. This result collaborates with the findings of Duru *et al.* (2006) and Udedibie and Ogbonna (2006) that reported the main cause of mortality in ducks in Nigeria to be from automobiles. Again, predators (such as snakes, cats and irate neighbors whose farms have been

destroyed by scavenging ducks) account for approximately 24.24% of deaths in ducks, while diseases account for about 16.16% of death in ducks. This result, however, is inconsistent with the reports by FAO (2009a) and Oguntunji and Ayorinde (2015) that disease was the main cause of mortality in ducks. However, Etuk *et al.* (2006), in another study, indicated that zero mortality in ducks can be achieved when ducks are reared in semi-intensive and intensive systems.

Fig. 2 Causes of duck mortality

Constraints to duck meat consumption

The myths surrounding ducks (62.28%) constitute the main constraint against consumption of duck meat (Figure 3). The duck is raised and kept for traditional and sacrificial purposes only, allowing people to avoid them as a plague. This attitude makes the duck unpopular and its potential remains untapped. This report collaborates with the findings of Ogunjinmi *et al.* (2009)

who reported various socio-cultural factors, religious beliefs, taboos and norms as dictating the consumption and use of several animals in a typical African society. Ola *et al.* (2003), in another study, reported that the duck was the most revered domestic bird in Nigeria and that its potential had not been exploited because of the many strange myths and taboos associated with it.

Fig. 3 Constraints to duck meat consumption

Conclusion

Duck farming is still practiced by only very few farmers and its production and improvement is hindered by myths and taboos that portrays it as a sacrificial and dirty bird. Efforts should be made to increase production and conservation by raising awareness of the potentials of the duck.

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Received: 12th April, 2019

Accepted: 15th June, 2019