

Status and Production Systems of Duck in the West Coast Region of The Gambia

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Abstract

Information about duck production and management systems in The Gambia is important for the improvement of poultry enterprises. This study, therefore, investigated duck production in the West Coast Region of The Gambia. Three districts consisting of Kombo North, Kombo South, and Kombo East were randomly selected for the study. A combination of cluster, purposive, and snowball sampling techniques was employed for the study using a structured questionnaire to elicit information on respondents' demographic characteristics, management practices, and challenges facing duck production. The data collected were subjected to descriptive statistical analysis using with SPSS Version 20. The results from the study revealed that both males and females were actively engaged in duck farming, with 52.0% and 48.0% of the respondents, respectively. The majority (48.0%) of the farmers identified feed shortage as the most limiting constraint to duck production. Most respondents (88.0%) raised ducks primarily for household consumption, while all (100.0%) kept only local breeds. Most (92.0%) of the duck farmers had no access to veterinary services. Furthermore, most of the respondents (82.0%) reported that superstitions associated with ducks were the most discouraging factors keeping many people away from engaging in duck rearing. Most farmers (80.0%) practiced the extensive system of duck production and 78.0% reported an average clutch size of 11-15 eggs per clutch. It can be concluded that only local breeds of duck were kept primarily for family consumption under an extensive management system, while feed shortage and limited accessibility to veterinary services were identified as the major constraints to duck production. It is therefore recommended that government and non-governmental organizations be actively involved in making improved breeds and veterinary services available and affordable. Also, awareness of the potential of ducks as an alternative source of poultry meat and eggs should be intensified.

Keywords: Duck producers. Local breed, superstition, veterinary services, extensive system



Situation et systèmes de production de canards dans la région de la côte ouest de la Gambie

Résumé

Les informations relatives à la production et aux systèmes de gestion des canards en Gambie sont importantes pour l'amélioration des exploitations avicoles. Cette étude a donc porté sur la production de canards dans la région de la côte ouest de la Gambie. Trois districts, à savoir Kombo Nord, Kombo Sud et Kombo Est, ont été sélectionnés au hasard pour l'étude. Une combinaison de techniques d'échantillonnage par grappes, raisonné et en boule de neige a été utilisée pour l'étude, à l'aide d'un questionnaire structuré visant à recueillir des informations sur les caractéristiques démographiques des répondants, leurs pratiques de gestion et les défis auxquels est confrontée la production de canards. Les données recueillies ont fait l'objet d'une analyse statistique descriptive à l'aide du logiciel SPSS version 20. Les résultats de l'étude ont révélé que les hommes et les femmes étaient tous deux activement impliqués dans l'élevage de canards, représentant respectivement 52,0 % et 48,0 % des répondants. La majorité (48,0 %) des éleveurs ont identifié la pénurie d'aliments pour animaux comme le principal obstacle à la production de canards. Les données recueillies ont fait l'objet d'une analyse statistique descriptive à l'aide du logiciel SPSS version 20. Les résultats de l'étude ont révélé que tant les hommes que les femmes pratiquaient activement l'élevage de canards, avec respectivement 52,0 % et 48,0 % des personnes interrogées. La majorité (48,0 %) des éleveurs ont identifié la pénurie d'aliments pour animaux comme le principal obstacle à la production de canards. La plupart des répondants (88,0 %) élevaient des canards principalement pour la consommation familiale, tandis que tous (100,0 %) ne détenaient que des races locales. La plupart (92,0 %) des éleveurs de canards n'avaient pas accès à des services vétérinaires. En outre, la plupart des répondants (82,0 %) ont indiqué

que les superstitions associées aux canards constituaient le principal facteur dissuasif empêchant de nombreuses personnes de se lancer dans l'élevage de canards. La plupart des éleveurs (80,0 %) pratiquaient un système d'élevage extensif et 78,0 % ont déclaré une taille moyenne de couvée de 11 à 15 œufs par couvée. On peut en conclure que seules des races locales de canards étaient élevées principalement pour la consommation familiale dans le cadre d'un système d'élevage extensif, tandis que la pénurie d'aliments pour animaux et l'accès limité aux services vétérinaires ont été identifiés comme les principaux obstacles à la production de canards. Il est donc recommandé que les organismes gouvernementaux et non gouvernementaux s'impliquent activement pour rendre les races améliorées et les services vétérinaires accessibles et abordables. Il convient également de mieux faire connaître le potentiel des canards en tant que source alternative de viande de volaille et d'œufs.

Mots-clés : Éleveurs de canards. Race locale, superstition, services vétérinaires, élevage extensif

Introduction

Duck production plays an important role in the poultry subsector by contributing to household nutrition, income generation, and food security, particularly in developing countries. In the Gambia, like many African countries, duck rearing received little research attention and a poor policy framework, unlike chicken production, despite having great potential in the development of the poultry industry. Chickens have predominated the poultry industry because of their established value chains and perceived commercial viability, and are major producers of meat and eggs. However, ducks is an important species in both commercial and smallholder poultry systems globally, with their economic, nutritional, and environmental benefits are becoming more widely recognized (Farrell, 2015; Pingel, 2017).

In comparison with chicken, ducks are better adapted to low-input rural systems because of their resilience to common poultry diseases, tendency to thrive under diverse environmental conditions, particularly in wetland ecosystems, and ability to utilize scavenged feed resources (Farooq *et al.*, 2002). These characteristics make duck farming suitable in smallholder system in developing countries with limit accessibility to quality feed, veterinary care support and intensive management.

Duck production remains underdeveloped with all their productivity potentials when compared with chicken production. This underdevelopment is reflected by the dearth of limited research information, poorly extension services, insufficient policy support, and low research

funding (Rashid *et al.*, 2018). According to Ministry of Agriculture, National Livestock Census (2016). There are 7,959 ducks in the West Coast Region, comprising 4,822 males and 3,137 females, which represents 18.2% of the national duck population. The Upper River Region has the largest proportion (28.6%), suggesting that the regional duck population highlights the importance of duck production in research and intervention in the areas.

The baseline data suggest the need for investigation into the production systems, husbandry practices, and management constraints that challenge duck farming in the region. An understanding of existing husbandry practices and constraints farmers face is necessary in improving productivity, profitability, and sustainability of duck enterprise in The Gambia. Adeola and Olukosi (2019) emphasized that knowledge of these factors is necessary for developing duck farming into a sustainable and profitable enterprise. However, information on duck management systems, productivity, and sustainability is limited; therefore, this study was designed to investigate duck production systems in three selected districts. in the West Coast Region of The Gambia

Methodology

Study Location

The study was conducted in three districts: Kombo Central, Kombo North, and Kombo South in the West Coast Region, The Gambia. Kombo Central lies at a latitude of 13°15'N and longitude 16°40'W, with an annual rainfall between 1,000 and 1,500-millimeters. Kombo is located at a latitude of 13°22'N; longitude: 16°40'W, with an average annual rainfall of 800 to 1,200 mm.

Kombo South is located at a latitude of 13°10'N and a longitude 16°40'W with annual rainfall ranging between 1,200 and 1,500 millimeters. Agricultural and livestock production systems across the districts were influenced by the rainfall distributions.

Sampling

The study employed a combination of cluster, purposive and snowball sampling techniques. Cluster sampling was used to randomly select three districts within the West Coast Region. Within the selected districts, duck farmers with a minimum of a year experience and a minimum flock size of three ducks were identified and purposively sampled. Subsequently, initial respondents referred other duck farmers who were otherwise difficult to identify by the snowball sampling technique.

Data Collection

Based on the distribution of duck farmers in the study area, data were collected from 50 respondents (17 from Kombo Central, 21 from Kombo South, and 12 from Kombo North). Primary data were collected from individual interviews using a structured questionnaire, including both closed and open-ended questions. The questionnaire elicited information on farmers' socio-demographic characteristics, duck production systems, feeding practices, health management, and socio-cultural beliefs associated with duck rearing beliefs associated with duck rearing.

Data Analysis

The collected data were analysed using descriptive statistics, including frequency, percentages, and pie chart.

The analysis was conducted using IBM SPSS software version 20 and MS Excel 2020.

Results

Socio-economic characteristics of duck farmers

Table 1 presents the socio-economic characteristics of duck farmers in the study area. The results reveal that the predominant age group was between 31 and 40 years, representing 36%. The gender distribution comprised of male (52%) and female (48%), suggesting a relatively balanced participation among the genders in duck farming. It was observed that Arabic education had the highest number (32%) of respondents. While household size showed that 50% of the respondents had a family size ranging from 7 to 10 family members. A larger proportion (60%) of

the farmers were Muslims, while 40% were Christians

Table 1: Demographic characteristics of duck farmers

Variable	Frequency (N= 50)	%
Sex		
Male	26	52.00
Female	24	48.00
Total	50	100.00
Age (years)		
< 20	1	2.00
20-30	7	14.00
31-40	18	36.00
41-50	15	30.00
51-60	8	16.00
61 >	1	2.00
Total	50	100.00
Educational level		
Primary	3	6.00
Secondary	11	22.00
Tertiary	15	30.00
Agricultural training	5	10.00
Arabic	16	32.00
Total	50	100.00
Household size		
2-3	6	2.00
4-6	25	12.00
7-10	15	50.00
11-14	3	30.00
More than 14	1	6.00
Total	50	100.00
Religion		
Islam	30	60.00
Christianity	20	40.00
Total	50	100.00

Table 2 presents the breed distribution, source of finance, and foundation stock of the duck farmers in the study area. The results show that all the respondents (duck farmer, 100%) rear local breeds of duck, indicating that the farmer depend on native duck genetic pool. Larger proportion (82%) of the farmer financed their enterprise by sourcing from relatives and family, when fewer other (18%) from local cooperatives, showing that financial institutions are limited in supporting duck farming. Most of the farmers (48%) started their foundational flock as gifts, followed by those (46%) who purchased their stocks, while a 6% of the farmers inherited their birds.

Table 2: Breed distribution, source of finance and foundation stock

Variable	Frequency (N=50)	Percentage %
Breed		
Local	50	100.00
Others	0	0.00
Total	50	100.00
Source of foundation of stock		
Inherited	3	6.00
Purchase	23	46.00
Gift	24	48.00
Total	50	100.00
Source of Finance for duck farmers		
Family and friends	41	82.00
Local Cooperative	9	18.00
Total	50	100.00

Table 3. Flock size, duration and purpose of keeping ducks

Table 3 presents the flock size, years of duck farming experience, and purpose of keeping ducks among respondents in the study area. The majority (34%) of the respondents owned 1-5 ducks, followed by those that keeping 6-10 ducks (28%), indicating that duck production is predominantly practiced on a subsistence scale.

Sixty-eight percent (68%) of the respondents had 1-2 years of duck farming, indicating that is an emerging enterprise among poultry farmers in the study area. Most duck farmers (88%) kept them purposely for their household consumption, highlighting the small-scale nature of duck production, with limited emphasis on commercialization.

Table 3: Flock size, duration and purpose of keeping ducks

Variable	Frequency (N=50)	%
Flock Size		
1-5	17	34.00
6-10	14	28.00
11-15	8	16.00
16-20	7	14.00
21 and above	4	8.00
Total	50	100.00
Duration of keeping ducks		
1-2 years	34	68.00
3-5 years	12	24.00
6-9 years	3	6.00
More than 10 years	1	2.00
Total	50	100.00
Purpose of keeping ducks		
Income	6	12.00
Consumption	44	88.00
Total	50	100.0

Table 4. Reproductive performance of ducks

Table 4 presents the reproductive performance of ducks in the study area. The findings reveal that (80%) of farmer are of the opinion that ducks

attain sexual maturity in 7-9 months of age. It also reveals that slightly more than half of the farmer (55%) reported that ducks incubate their eggs for 11-15 clutch days. A very high proportion of the

respondents (78%) indicated that an average clutch size is between 11-15 eggs. It also further showed by the majority of the respondents (90%) that the number of ducks surviving adulthood

ranges from 6-10 ducks, which constitute (70%) of the total flock. The study reveals that 90% of the farmers experienced 1-2 clutches per year.

Table 4. Reproductive performance of ducks

Variable	Frequency (N= 50)	%
Age of sexual maturity		
4-6 months	6	12.00
7-9 months	41	82.00
10 months and above	3	6.00
Total	50	100.00
Clutch length in days		
6-10	22	44.00
11-15	28	56.00
Above 15 days	0	0
Total	50	100.00
Average clutch size (eggs)		
5-10	6	12.00
11- 15	39	78.00
16-20	5	10.00
Above 21 years	0	0.00
Total	50	100.00
Number of ducks surviving adulthood		
0-5	14	28.00
6-10	35	70.00
16 and above	1	2.00
Total	50	100.00
Number of clutches per year		
1-2	49	98.00
3-4	1	2.00
Total		

Table 5 presents the management practise of duck farming in the study area. It reveals that many duck farmers (50%) practiced an extensive management system, while 26% used the intensive system, and 24% adopted a semi-intensive system. This indicates that duck production in the study area relies on husbandry practices that make use of low-input resources. An equal proportion of farmers (50%) provided supplementary feed, and the remaining 50%

relied on natural foraging, suggesting an equilibrium between scavenging and feed supplementation. Furthermore, 52% of the farmers provided a pool or water source for their ducks, while 48% did not. Most farmers (72%) provided drinking water, whereas 28% did not. These indicate that the farmers recognize the importance of water supplementary feeding to their flock in enhancing the birds' productivity.

Table 5. Management practices of ducks in the study location

Variable	Frequency (N=50)	Percentage (%)
Management practices of ducks		
Extensive	25	50.00
Intensive	13	26.00
Semi intensive	12	24.00
Total	50	100.00
Provision of feed		
Yes	50	50.00
No	50	50.00
Provision of pool		
Yes	26	52.00
No	24	48.00
Total	50	100.00
Provision drinking water		
Yes	36	72.00
No	14	28.00
Total	50	100.00

Table 6. Health and disease control

Table 6 shows the health and disease control amongst duck farmers. The majority (72%) of farmers reveal that their ducks fall sick occasionally. The study also shows that (80%) of

the farmers treat their sick ducks, while (98%) of the farmer do not vaccinate their ducks. It also shows that almost all the respondents (92%) of the farmers do not have access to veterinary services.

Table 6. Health and disease control

Variable	Frequency (N= 50)	%
How often do they fall sick		
Rarely/do not fall sick	14	28.00
Occasionally	36	72.00
Total	50	100.00
How sick ducks are handled		
Treat sick ducks	40	80.00
Slaughter and consume	4	8.00
Do nothing	6	12.00
Total	50	100.00
Vaccination		
Yes	1	2.00
No	49	98.00
Total	50	100.00
Access to veterinary services		
Yes	4	8.00
No	46	92.00
Total	50	100.00

Table 7 presents the major constraints faced by farmers in the study area. The findings reveal that a good number of duck farmers (74%) reported that weakness and inability to walk are the most common health-related challenges affecting their

flocks, indicating that limb weakness is prevalent in the study area. High cost of feed as a production constraint was reported by 48% of the farmers, indicating that feed affordability remains a major production challenge in duck farming. However,

theft is not a problem, as (74%) of farmers had never experienced theft cases. The study also reveals that (84%) of farmers lacked direct access to the market for the sale of ducks and their

products. This highlights that poor marketing structure constitutes a problem to commercialise duck and their products.

Table 7. Diseases and other constraints faced by duck producers

Variables	Frequency (N=50)	Percentage (%)
Common Disease of ducks		
Weakness and inability to walk	37	74.00
Others	13	26.00
Total	50	100.00
challenges in duck farming		
High cost of feeding	24	48.00
Lack of access to market	12	24.00
Disease outbreak	1	2.00
Theft of ducks	4	8.00
Superstition or cultural belief	2	4.00
No access to veterinary service	7	14.00
Total	50	100.00
Lost to theft		
Yes	13	26.00
No	37	74.00
Total	50	100.00
Access to Market		
Yes	8	16.00
No	42	84.00
Total	50	100.00

Discussion

The findings of this study reveal a complex nature of both opportunities as well as challenges in duck production in the West Coast region of The Gambia. Although many communities engage in duck farming, the production systems are still primarily unstructured, underdeveloped, small-scale, and subsistence in nature, with most farmers keeping small flocks primarily for their household consumption as a source of important nutrition (Sonaiya and Swan, 2004; Alders and Pym, 2009).

The socio-economic characteristics of the farmers show that, duck farming is inclusive, with nearly equal numbers of male and female respondents. This gender balance is encouraging and suggests that interventions at duck production could empower both men and women, this is consistent with Guèye (2000) and FAO (2013). The predominance of young adults suggesting that duck farming is primarily appealing to individuals in their productive years; furthermore, the relatively large household sizes (7–10

members), reported by the respondents suggests that family members provide labour for duck farming, which is in line with Farooq *et al.* (2002), who observed that duck farming is often practiced by rural households with little capital but sustained by family labor. Respondents' educational backgrounds, including Arabic and formal education, as reported by Alders *et al.* (2018) it is of essence in designing and implementing extension services.

In addition, most of the farmers relied on informal sources of finance, including family and friends, indicating poor access to agricultural credit schemes or financial services. This serves as a hindrance to investment in improved feed production, housing systems, and health management. Similarly, the findings that all respondents kept indigenous duck breeds, which were gotten either as a gift or purchased from other farmers, show reliance on unimproved native indigenous genetic resources. However, while indigenous breeds are known to be hardy and adaptable, their productivity may be lower

than that of their counterpart improved breeds, which aligns with the report of Rashid *et al.* (2018).

Assessing flock sizes and rearing experience, it was observed that farmers with small flock sizes (1-5 ducks) had a little rearing experience (1-2 years), suggest that duck farming is still upcoming in the study area. Such small flock sizes are common in village poultry systems and frequently indicate risk aversion, resource scarcity, and limited market (Permin and Pedersen 2002).

Only few duck producers kept ducks as a source of income; while most of them (88%) kept ducks mainly for household consumption. These findings further support. Tadelles *et al.* (2003) and Sonaiya and Swan (2004), who reported the subsistence nature of duck enterprise village poultry predominantly contributes to household nutrition and food security.

Ducks are hardy and have excellent productivity, but their full potential in West Africa has not yet been realized because of their inadequate integration into income-generating schemes, as noted by Duru *et al.* (2006).

Ducks in the study area had a moderate reproductive performance which is typical of indigenous breeds. Most farmers reported that ducks attained sexual maturity at 7 and 9 months and clutch sizes of 11-15 eggs. A high population of ducks in the study area appear to have very short laying times each clutch, as evidenced by the fact that none of farmers reported small clutch sizes (<21eggs) and an average clutch duration longer than 15 days. This is consistent with values within the normal range reported for local ducks (Islam *et al.*, 2014). The local duck breeds managed traditionally frequently have reduced clutch sizes as a result of stress, poor nutrition, and uncontrolled breeding Pingel (2017). However, the predominant management practice in the study area was extensive production system which half of the farmer reared their birds on free-range scavenging. Although, the system reduces production costs, it predisposes the ducks to predation, diseases, poor reproductive control and feed shortages in challenging areas where they are reared.

Intensive and semi-intensive system of production are uncommon in the study area, despite the prospect of intensive system of rearing duck. Farrell (2015) and Mwalusanya *et al.*

(2002) reported that productivity of the duck can be significantly improved by transition from extensive to semi-extensive to intensive management system which support proper nutrition and health care. . Furthermore, half of the respondents reared their ducks solely on scavenging and the other half provided a supplement feed to their flocks, this suggests inappropriate of nutrients to the birds and may affect growth and egg production of the birds especially during periods of feed scarcity. Poor growth and poor reproductive performances could be as a result of poor nutritional support, particularly during the dry spell when feed supplies are limited (Farrell, 2015). A moderate number of farmers offer pools, which are necessary for the natural behavior, thermoregulation, and cleanliness of ducks. According to Rahman *et al.* (2018), having access to water bodies improves duck productivity and wellbeing, especially in systems that include rice and ducks. On the other hand, 72% of the farmers supply drinking water, which is essential for effective poultry husbandry. However, 28% of farmers still do not regularly offer water access, which puts them at danger for dehydration and makes them more susceptible to illness (Farooq *et al.*, 2002). Many of the farmers make a provision of pools and drinking water, indicating good management practice due to importance of water to nutrition, duck welfare, thermoregulation and the need to exhibit their natural behaviour (Rahman *et al.*, 2018).

One of the critical constraints in duck production in the study area is health management. Although a few of the farmers reported occasions when their ducks were sick with lower attempt of treatment and vaccination probably due to lack of access to veterinary services. This findings reinforce earlier reports that effective disease control is hampered by a lack of veterinary support which remains a reoccurrence constraint in traditional management system in sub-Saharan Africa (Rashid *et al.*, 2018; Spradbrow, 2005). Lack of access to veterinary care may increase disease incidences, mortality and poor performance of the birds. farmers The major constraints cited by the farmers included as high feed cost, limited market accessibility, and socio-cultural discouraging duck keeping. This agrees with Kadurumba *et al.* (2019) who reported cultural beliefs as a major constraints to

duck production in the Eastern part of Nigeria. Interestingly, most respondents did not have a substantial report of duck theft, which suggests that duck farming is a secured enterprise in the study area. The lack of market access reported by most of the farmers limits the potential of commercializing duck farming. Poor marketing structure causes low income to the farmers which affect the expansion of their farms beyond subsistence level, as also noted Adeola and Olukosi (2019).

A particularly important finding of this study is the influence of superstitious and cultural beliefs on duck farming. Most of the duck farmers stated that beliefs and myths discourage duck rearing by causing reduce adoption even where the ecology is favorable to the duck rearing and economic potential is high. These conditions hinder community-wide adoption of duck farming in addition to decreasing interest in it, these are similar to observation of Rahman *et al.* (2018) and Dolberg (2008), who reported in other rural areas that ducks were culturally perceived negatively or spiritual inclined. This call for cultural sensitization with technical intervention in duck production.

Conclusion

The study concludes that duck farming in the West Coast Region is mainly managed in small-holding system, subsistence-oriented, gender bias free, with active involvement of both men and women in the rearing. production. However, the enterprise is hindered by superstitions, high feeds costs, poor market access, adoption of local breeds, poor veterinary services and the use of unproductive traditional management system in the Gambia. Therefore, the that the government should support duck production through the provision of affordable feeds, improved duck breeds, veterinary support, extension services, and public awareness to address misconceptions of the myth around duck production. The right policy, support, and other technical interventions are expected to improve duck farming from a subsistence level into an intensive system that is profitable and sustainable. awareness-raising, and access to improved breeds.

Contribution of authors

Phillips Ademola Adewuyi served as conceptualizer, writer, reviewer, data analyst, and validator, while Toney Correa contributed as a data collector, writer, and data analyst.

Ethical approval

Ethical approval was not required for this study, as it involved only interviews and did not include any direct experimentation on animals or human subjects.

Conflicts of interests

The authors declare that there is no conflict of interest regarding the publication of this study.

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