



## RESEARCH ARTICLE

## PRESENT STATUS OF FREE-RANGE DUCK FARMING SYSTEM OF TULSIPUR DANG, NEPAL

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## ABSTRACT

The survey was conducted in Malwar and Kwangi villages of Tulsipur sub-metropolitan city of Dang district to study the present status of the free-range duck farming system. The data were collected from 50 farmers of each village by interviewing the close-ended questionnaire. The majority of the farmers (74%) reared both duck and chicken while the remaining farmers reared duck only. About 40% of the farmers used maize as feeding materials. The percentage of farmers keeping ducks in their living house and not using any bedding materials was 50 and 32 respectively. The average sexual maturity days, adult weight, egg production, and egg weight were 189.83 days, 1.99 kg, 104.91 and 60.95 g, respectively. Most of the farmers (61%) reported no disease problem but sometimes duck cholera was a major problem. Out of total farmers, about 98% did not vaccinate and 82% did not provide vitamin and mineral supplements. The average mortality rate was 14.64% per year. Thus, it can be concluded that the rearing method of duck is traditional and lack of appropriate housing and inadequate supply of vaccines, medicines, vitamins and minerals are the major problems. Programs related to training and budget should be introduced to overcome these problems.

## KEYWORDS

Duck; free-range; mortality; maturity; production.

## 1. INTRODUCTION

About 20% of the human body is made up of protein (Brown, 2017). A normal human being requires 0.8g protein/kg body weight per day (Mangano et al., 2017). Around 50% i.e. 23-28 g of the required protein comes from animal sources (Javaid, 2020). So, the demand for poultry products like egg and poultry meat is increasing as poultry egg and meat have been recognized as the fastest way to fulfill protein supply to humans in the shortest run. Among various poultry farming duck farming is also one. Duck's meat and eggs are important sources of protein and iron (Tai and Tai, 2001). Ducks have more economic egg-laying life than chickens and lay eggs that are 15-20 g heavier than chicken eggs (Kunnath and Kumar, 2018). Ducks are hardy, can re-stand several diseases, require less manpower to manage and have a better adaptation to various environmental conditions (Adzitey and Adzitey, 2011). The manure of ducks can also be used to improve soil fertility (Jha and Chakrabarti, 2017). In Nepal, the total number of ducks was 416,400 among which 190,747 were laying ducks in the period 2018/19 (MoALD, 2020). Similarly in the period of 2018/19, the total meat production in Nepal was 357,082 metric tonnes in which duck meat contributed 353 metric tonnes (MoALD, 2020). Further, the total egg production in Nepal during 2018/19 was 1,549,689,000 in which ducks contributed 15,009,000 eggs (MoALD, 2020). In Dang during the period of 2018/19, the total number of ducks, egg production from duck and meat production from duck were 8,115, 367,000 and 8 metric tonnes, respectively (MoALD, 2020).

Free-range duck farming means a method of farming where the ducks for

at least part of the day can roam freely outdoors, rather than being confined in an enclosure for 24 hours each day. Ducks can be raised on a small and commercial scale even in a backyard with other birds or animals. In Nepal, the duck population is scattered throughout the country and generally raised in traditional farming systems alongside local chickens. Almost all ducks raised in backyard systems are free-range and concentrated near water sources and are more common in certain ethnic communities like Tharu, Newar and Rajbansi. Demand for duck meat especially for free-range duck meat is increasing rapidly in local markets butcher shops, restaurants and supermarkets. Although Nepal has the biodiversity of the land topography and climates where livestock farming including poultry rearing exists in all the regions, most of the farmers raise small numbers of livestock in small land (Pradhanang et al., 2015).

The rural farmers do not have much knowledge of different aspects of duck management. Despite their importance indigenous breeds are under threat due to various factors such as changing production systems and indiscriminate crossbreeding. Intensive grain based poultry farming along with an extensive free-range system is blooming day by day and supporting the national GDP (Dhakal et al., 2019). Systematic data related to free-range duck farming systems can help duck and poultry sectors to bloom more. Till now no systematic data are available regarding the status of the free-range duck rearing system of Tulsipur, Dang. Therefore, the study was undertaken to know the present status of free-range duck farming in Tulsipur Dang. This survey will help to know the present status and problems of free-range duck rearing of Tulsipur, Dang along with some suggestions.

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## 2. MATERIALS AND METHODS

Two villages of Tulsipur, Dang district and a hundred farmers i.e. 50 from each village were selected randomly. The selected areas (Malwar and Kwangi) and farmers were based on their traditional crop production combined with livestock and small-scale poultry production system. The data were collected by interviewing the close-ended questionnaire. Data related to different parameters like the rearing system, housing system, feeding frequency and materials, productivity, disease, vaccination and mortality were recorded. Under the productivity parameters, days for sexual maturity, adult weight, egg production and egg weight were recorded. Days for sexual maturity were categorized into early (<190 days), moderate (190-200 days) and late (>200 days) groups. The adult weight was expressed in kilograms (kg) and was categorized into low (<1.5 kg), moderate (1.5-2.0 kg) and high (>2.0 kg) groups. The egg production was categorized into low (<96/duck/year), moderate (96-110/duck/year) and high (>110/duck/year) groups. The egg weight was expressed in grams (g) and was categorized into low (<61 g), moderate (61-63 g) and high (>63 g) groups. Collected data were analyzed as per the objectives of the study. Mean and percentage were used mainly to illustrate the results.

## 3. RESULT AND DISCUSSION

### 3.1 Rearing system of duck

Most of the farmers (74%) reared both chicken and duck in a combined form (Figure 1). Similarly, only a few percentages of farmers reared only duck (Figure 1). Thus, chicken and duck were found to be the most common poultry species reared by the farmers in both villages. Most of the farmers did not have a sufficient budget to rear ducks alone on a commercial scale. Thus farmers may have adopted the combination of chicken and duck rearing to improve their livelihood to some extent.

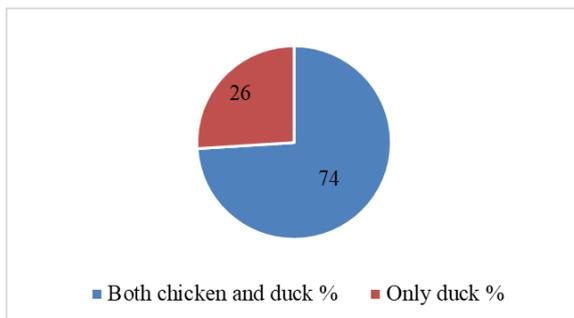


Figure 1: Rearing system of duck.

### 3.2 Housing

About 50% of farmers kept duck in their living house while the rest of the farmers used house made of wood and tin or soil and tin or soil and bamboo (Table 1). Most of the farmers are rearing their ducks in their living house which indicates that most of the farmers can not afford the separate house to duck due to low economic condition. About 32% of the farmers did not use any bedding materials in the house of the duck. Other farmers mostly used straw as a bedding material followed by rice husk and jute sack (Table 2).

Housing types	Percentage (%)
Living housing	50
House of wood and tin	35
House of soil and tin	10
House of soil and bamboo	5

Bedding materials	Percentage (%)
Rice husk	28
Jute sack	11
Straw	29
Don't use	32

### 3.3 Feeding frequency and materials

The majority of the farmers (74%) provide feed twice a day during morning and evening to their ducks while 6% of the farmers do not provide any feed (Figure 2). Farmers who provide feed to their ducks used

a wide variety of feed. The study showed that about 40% of the farmers used maize which is followed by rice bran, broken rice and boiled rice as feed ingredients for ducks in both villages (Figure 3). The average feed rate provided to the duck was 128.78g feed/day/duck. Farmers are using homemade feeding materials due to low economic conditions and unaware of the commercially produced feeding materials which contain various nutrients. They should also be made aware of the commercially produced feeding materials which contain various nutrients and feeding materials should be made easily available at low cost. It was also reported that 82% of farmers did not provide any type of vitamin and mineral supplements to ducks and only 18% of farmers provide vitamins and minerals to ducks.

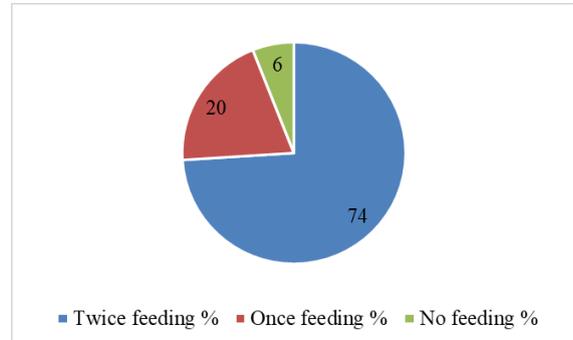


Figure 2: Feeding frequency to duck

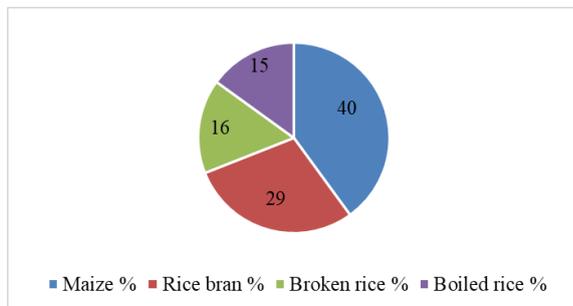


Figure 3: Feeding materials used by farmers

### 3.4 Productivity of duck

The days for sexual maturity vary from 184 to 210. Islam et al. (2003) reported the age of sexual maturity of duck varied from 180-210 days. Out of the total farmers, about 54% reported moderate days for sexual maturity (Table 3). The average day for sexual maturity was 189.83. The adult weight varied from 1.3 to 2.7 kg in which 1.5 to 2.0 kg adult weight of duck was reported by 43% of farmers. The average adult weight was found to be 1.99 kg. There was a large difference in egg production i.e. egg production varied from 81 to 125/duck/year it might be because some of the farmers provide feed while some farmers don't so feed may have played a significant role in the number of eggs. Out of total farmers, 49% of farmers reported 96-110 number of egg production/duck/year. The average number of egg production was found to be 104.91/duck/year. The egg weight varied from 58 to 67 g in which <61 g egg weight was reported by 49% of farmers. The average egg weight was found to be 60.95 g. The adult weight, egg production and egg weight can be increased by providing proper feed, vitamins and minerals.

Parameters	Category	Farmers %	Mean
Sexual maturity (days)	Early (<190)	41	189.83
	Moderate (190-200)	54	
	Late (>200)	5	
Adult weight (kg)	Low (<1.5)	22	1.99
	Moderate (1.5-2.0)	43	
	High (>2.0)	35	
Egg production (per duck per year)	Low (<96)	37	104.91
	Moderate (96-110)	49	
	High (>110)	14	
Egg weight (g)	Low (<61 g)	49	60.95
	Moderate (61-63 g)	41	
	High (> 63 g)	10	

### 3.5 Disease, vaccination and mortality

In the survey, it was observed that duck mainly suffered from duck cholera and duck hepatitis. Among the two diseases, the percentage of duck cholera was reported more than duck hepatitis (Figure 4). Islam et al. (2016) also recorded duck cholera as a major disease in duck. Further, it was also revealed that the percentages of non-diseased ducks are more than the diseased duck. Further, it was also obtained that only 2% of the farmers vaccinate their duck while 98% of the farmers don't provide any vaccination. It might be due to the lack of knowledge and facilities related to vaccines. The average mortality of duck was reported to be 14.64%. Out of total farmers, 57% of farmers reported that their duck mortality was between 10-20% (Table 4). This mortality of duck can be reduced by providing proper vaccination facilities.

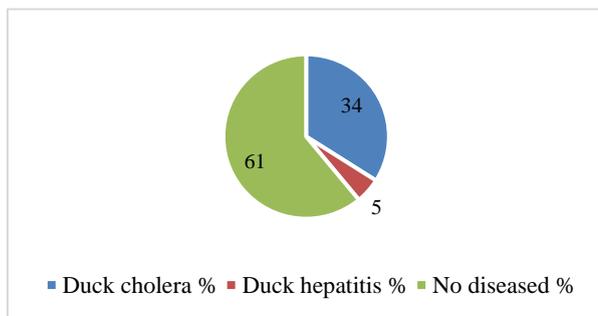


Figure 4: Diseases of duck

Table 4: Mortality of duck

Categories	Farmers %
Low (up to 9%)	33
Medium (10-20%)	57
High (>20%)	10

### 3.6 Constraints Of Free-Range Duck Farming

Traditional methods, scarcity of feed, lack of appropriate housing facilities, disease prevalence, and inadequate supply of vaccines, medicines, vitamins and minerals were identified as the major problems for free-range duck rearing.

### 3.7 Suggestions To Improve Free-Range Duck Farming

A systemic training program should be organized for the village farmers on rearing and management of ducks. Feeds, medicines, vaccines, vitamins and minerals should be made available at a reasonable price to increase the productivity of free-range duck farming. Some economic support should also be provided to small farmers from the government to develop duck farming. Extension and motivational works should be carried out in the villages to encourage the farmers to increase the level of duck production.

## 4. CONCLUSION

Thus, it can be concluded that farmers are traditionally rearing ducks. The majority of the farmers reared both chicken and duck together and maize was the major feeding material. About 50% of the farmers kept duck in their living house and 32% did not use any bedding materials. The average sexual maturity days, adult weight, egg production and egg weight were 189.83 days, 1.99 kg, 104.91 and 60.95 g, respectively. Out of total farmers, about 61% reported no disease problem, 98% did not vaccinate and 82% did not provide vitamin and mineral supplements to ducks and 14.64% was the average mortality rate per year. Shortage of proper feeding, housing and vaccination due to inadequate knowledge, facilities and budget were major problems in the study area. So programs related to

training and budget should be introduced to improve the production of ducks and the livelihood of farmers. The survey could have been more effective if more respondents, the data related to the breed of duck reared, hatchability, meat production of duck and production cost and benefit were available. In the future, researches can be conducted by taking more respondents with those parameters.

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