

Pekin duck (*Anas domestica*) farming in Mataram district of Lombok Indonesia: prospects and problems

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Abstract

Pekin duck farming in Mataram was studied using a questionnaire survey from May to December 2015 to understand the problems and prospects of this farming practice. A total of 34 duck farmers and 40 consumers in six districts of Mataram formed the respondents. The survey covered socio-economic profile of duck farmers (age, education, marital status, and farm size) and consumers (households and restaurant visitors).

It was found that duck production systems in Mataram were intensive systems with conventional management practices (traditional knowledge in duck farming). Pekin duck is the most commonly used exotic duck breed in Mataram. Most of the duck farmers were aged between 41-50 years (59%) with primary school education (76.4%), and their farming experience as meat duck growers were relatively short (1-5 years). Further, duck farming was not their main occupation with constraints such as lack of technical knowledge and capital availability. The non-familiarity and not tastier as chicken meat, and inappropriate method of cooking were another problems. Marketing systems were direct to traditional markets or poultry traders for the live birds while frozen meat was sold to hotels. Importing fertile eggs and ducklings were also constraints to maintain the production cycle. In spite of the constraints, the demand for meat ducks was very high, which was about 1045 birds per day but the supply was only 545 birds per day or about 50% of the demand.

Key words: *constraints, production system, supply-demand*

Introduction

Ducks play a very important position next to chicken for the small-scale farmers in Indonesia because they are a source of income and part time employment for the growers. Since ducks easily adapt to various environments and are more resistant to poultry diseases (than chicken), many rural people in the country practice commercial duck farming. However, compared to broiler chickens, broiler duck industry is less popular and its development seems relatively slow because of the poor quality of meat ducks (high in fat ; Huda et al 2010) and less efficient feed conversion (Wu et al 2012). Nonetheless, ducks are waterfowls, which are able to utilize economical feed resources (Pingel 2011). FAO (2003) reported that the meat duck have contributed to food security only by 2.9 per cent, with the average growth of 1.4 per cent per annum between 1981 and 1991, while chicken contributed by 33 per cent with the average growth of 6.2 per cent. However, duck production has been known to reduce poverty of rural communities in developing countries (Adzitey and Adzitey 2011; Pervin et al 2013). Although its contribution on a global scale is relatively small, they constitute important sources of income of the resource poor farmers in the rural areas. Furthermore, the demand for duck meat has been increasing in certain locations. For example, in Lombok, there is an increasing demand for duck meat, especially in the district of Mataram. This is indicated by the increasing number of food stalls and restaurants with duck meat as the main menu. It may be related to the development for tourism, which is now increasing due to the local government support. Inconsistent with this trend, there was a decline in the duck population in Lombok between 2006 and 2010 by 13.1 per cent, with an annual rate of 2.7 per cent (LSO-WNT 2012). The probable factors that led to this drastic decline in duck population are that a large number of layer type ducks in their growing period were slaughtered for meat purposes and that some layer duck farmers have shifted to meat duck farming owing to the larger economic gains associated with the latter. Thus, there is a potential market for meat duck farming in Lombok with opportunities for making greater profits. However, there are certain constraints that prevent its large scale adoption. Pekin duck (*Anas domestica*) is very well accepted as the best producers of duck meat (FAO 2003). Until recently Pekin ducks are the most exotic duck breed commonly used by the farmers and kept intensively. Most of the farmers in Lombok also practiced this breed but they have been unfamiliar with the production practices because they have been long to layer duck growers. Therefore, this study was undertaken to assess the current status of duck farming in Mataram district, with special reference to the marketing opportunities and the constraints in the use of duck meat. Also, suggestions are made to develop meat duck farming in Lombok in response to the increasing demand for meat duck in this region.

Materials and methods

The study was conducted in Mataram district through direct surveys to the local duck farmers from May to December 2015. Consumers were 25 household samples and 15 restaurant visitors. Mataram is the capital city of West Nusa Tenggara Province (WNTN) which lies between 08° 33'- 08° 38' South Longitude and between 116° 04'- 116° 10' East Longitude and is located within West Lombok because Lombok is made up 4 regencies namely: East, Central, West and North Lomboks. Mataram city has an area of 61.30 km² with the highest duck population (505942 of 866910 birds) or 58.4 per cent in Lombok till year 2010 (LSO-WNT, 2012) and has 406910 inhabitants in 2012 (EIS, 2012). Mataram is a municipal council in Lombok Island, Indonesia and it is made up of six districts namely: Ampenan, Sekarbela, Mataram, Selaparang, Cakranegara and Sandubaya. A pre-investigation study was conducted to select the respondents and all farmers who are raising Pekin ducks on the size of between 50 and 100 or more were included as respondents. Specialized layer duck producers were also asked to get the relevant information on duck farming.

A set of questioners were provided before the study (Hartono 2000). The study covered socio-economic profile of duck farmers like age, education, marital status, and farm size. Management systems and knowledge about meat duck farming such as housing, feeding, purchase and sale of birds and animal health were also included because these aspects relate to the quality of their production husbandry (Ugbomeh 2002). The selling pattern of live ducks and marketing channels such as traditional markets, hotels, restaurants, food tents and street vendors were also investigated. The farms were visited frequently to monitor the progress and understand the problems, if any. Assessments of duck meat perception including familiarity,

degree of likeness, and other factors influencing the duck meat consumption were evaluated using a modified model by Oteku et al (2006). Information on the population was gathered from the secondary sources and interviewed with relevant officers.

Results and discussion

Information on population of poultry according to species and districts in year 2013 is presented in Table 1. Most of the duck farmers live in the suburbs and the border to West Lombok regency.

Table 1. Poultry species population by districts within Mataram and its areas of each district, in 2013.

District	Local chicken	Layer chicken	Broiler chicken	Duck	Total	Area Km ²
Ampenan	13968	10	6028	2678	22684	9.46
Sekarbela	8376	0	0	1750	10126	10.32
Mataram	9996	5060	2450	2348	19854	10.76
Selaparang	13176	33	5590	1869	20668	10.76
Cakranegara	13299	0	5172	2272	20743	9.67
Sandubaya	7595	1480	11895	2230	23200	10.32
Mataram city	66410	6583	31135	13147	117275	61.30

LSO-M (2014)

Characteristics of duck farmers

Average age of duck farmers was dominated by the 41 and 50 year age group (59 per cent; Table 2), followed by the 30 and 40 year group (23.5 per cent). Only 17.5 per cent of respondents was between 51 and 60 and there was no duck farmers aged between 61 and 70, suggesting that the duck production system was operated by relatively older people. Most of the respondents had education up to the primary school level (76.4 per cent). Meat duck farming experience was relatively short (1 to 5 years) and the growers did not raise Pekin ducks alone but grew it with other poultry birds such as Muscovy ducks, layer ducks and local chickens in intensive housing structures (Figure 1). It was also observed that duck farming was not primary occupation (82.2 per cent of the respondents), indicating duck farming is a side activity of most farmers as an additional income source.

Table 2. Profile of duck farmers in Mataram districts (n=34).

Socio-economic characteristics	No of respondent	Duck farmers %
Age (Year)		
30 – 40	8	23.5
41 – 50	20	59.0
51 – 60	6	17.5
61 – 70	-	-
Primary occupation		
Farming	4	11.8
Others	30	88.2
Farm size (birds)		
50-100	30	88.2
>100 (1000)	4	11.8
Educational background		
Primary school	26	76.4
Secondary school	4	11.8
High school	4	11.8
Bachelor	-	-
Farming experience (year)		
1 – 5	20	59
6 – 10	14	41
11 – 15	-	-
16 – 20	-	-
>20	-	-
Household size		
1-3	18	52
4-6	14	41
7-9	2	7
Above 9	-	-

Field survey, 2015



Figure 1. Pekin duck farming in Mataram district.

Size and characteristics of commercial meat duck farms

Commercial operations of meat duck farms in Mataram varied in size from 50 to 1000 birds. Most of the farmers (88.2 %) had 50-100 birds, only two individual growers kept more than 1000 birds per batch (every 2 months). This is slightly different from the commercial meat chicken production where most farm operations were on the size of 2000 birds, grown under a contract agreement between a processing company or private sectors (called: *nucleus*) and individual farmers (called: *plasma*) and are often described as vertically integrated poultry production or a partnership contract grower (Indarsih and Suryatman 2012).

As noted earlier, the commercial Pekin duck farming is relatively new business in this region and there was no particular feed offered for Pekin breed because of lack of information on the nutrient requirements for meat ducks. The farmers provide commercial feed during the first week of life to

prevent the mortality at ducklings. Again, since commercial feed is too expensive for small farmers, they limit its use for feeding. Most of the respondents have poor knowledge about poultry management and technology. It was also observed that 88 per cent of the respondents have no information on government's programs in poultry and never adopted innovative technologies (Table 3). This is consistent with the observations of Pervin et al (2013) who indicated that lack of technical knowledge, feed scarcity and high price of feed were major constraints in duck farming.

Table 3. Understanding in technical knowledge and other relevant information by respondents (n=34)

Understanding in technical knowledge and other relevant issues	Yes	Percentage
Housing management	20	58
Feeding management	10	29
Health programs or name of duck diseases	10	29
Breeding programs	10	29
Incubation and hatchery	34	100
Replacement programs	16	47
Information on government's programs in poultry	4	11
Adoption of innovative technology	4	12

Field survey, 2015

Future prospects and problems for the broiler duck production

The significant growth in the commercial broiler duck sector in the recent years could be attributed to the introduction and development of tourism in Lombok. As a consequence, the number of street vendors, restaurants and food tents with the main course of duck meat has increased. The net effect was that demand reached 1045 birds per day (or 344925 birds/year) (Table 4). Although different sources of supply were available, the demand could not be satisfied fully and only 545 birds per day were available. In other words, there was approximately 50 per cent shortage of the total demand for meat ducks per day, which is likely to increase in future. When site visits were conducted, some farmers argued that they sold the growing or culled layer ducks because the demand for duck meat was rising. It is interesting to note that the majority of consumers preferred to eat culled layer ducks for duck meat as duck meat from Pekin breed in the market was insufficient. Part of the unfulfilled demand of hotels and restaurants for duck meat was also supplied by from Java in the form of frozen meat.

With respect to marketing and pricing, it was found that there are several ways to market meat ducks such as directly to consumers, through the collectors and poultry itinerant traders (Figure 2). The market price varied depending on the marketing chains and season. But the price of duck meat is relatively stable and more expensive than broiler chickens because the duck meat was not common white meat and not many consumers preferred duck meat. Table 5 shows that the selling price of duck meat was dependent on the marketing channel and various types of ducks. Price of the culled layer ducks (USD 3.39-3.77) was more expensive than from the exotic meat ducks (USD 3.01-3.39), because most consumers preferred to eat duck meat of layer ducks or of Muscovy ducks. Traders in the poultry market provided these two water fowl breeds for duck meat stocks (Figure 3). However, the selling price from farm level was cheaper than that of the local markets. Pricing was not set by the farmers or producers, but it was arranged by the traders or middleman. Similarly, the number of population to be maintained and expanded also depended on the traders even if there is a potential market. There is also an indication that inaccessibility to the credits for one year of on-farm operation is one of the predominant constraints on the meat duck grower. They would not be able to maintain and sustain the farm operations without credit facilities. This indicates that farming was impeded by the inability of the as smallholders to access finance . According to respondents, the meat duck production is more beneficial and they can get more returns than those of the layer duck production.

Table 4. Demand and supply per day for meat duck marketing (n=48)

Marketing	Demand Supply	
	No of birds	
1.Traditional markets (n=8)		
Mandalika	185	50
Kebun roek	120	65
Sindu	370	70
Pagesangan	20	10
	Sub-Total	695 195
2. Street traders (street vendors and food tents) (n=30)	150	150
	Sub-Total	150 150
3. Hotels and restaurants * (n=10)		
Hotels	105	105
Restaurants	95	95
	Sub-Total	200 200
	Total	1045 545

*Field survey, 2015 *Frozen duck meat*

Table 5. Comparison of selling price (USD*) between farmer levels and local markets

Item	Units	Selling price of farmer	Selling price of local market
Meat duck/Pekin duck	bird	3.01-3.39	4.52-4.60
Culled layer duck	bird	3.39-3.77	4.15-4.50
Growing duck	bird	2.26-3.01	3.01-4.00
Frozen duck meat	kg	3.00-3.01	

* 1 USD = IDR 13,250 *Field survey, 2015*

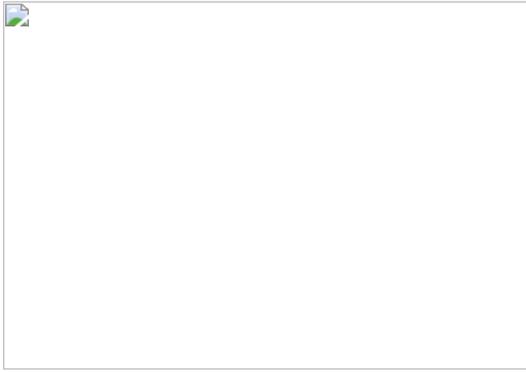


Figure 2. Poultry itinerant merchant with his motor cycle to collect culled layer ducks and chickens.

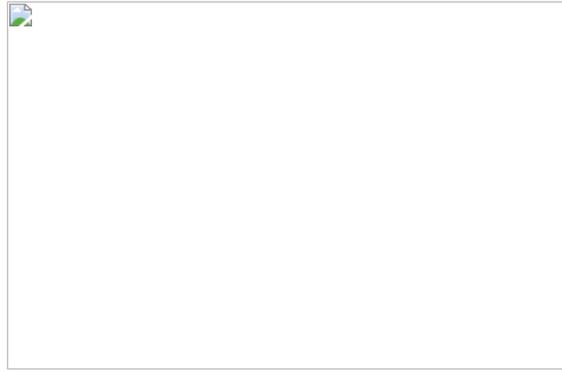


Figure 3. Muscovy ducks sold in the poultry market as an alternative duck meat.

Table 6 reveals constraints limiting duck meat consumption. Assessment to duck meat preferences indicated that unfamiliarity, less taste, and price compared to chicken meat were challenges to increase duck growing. The high unfamiliarity rate (75%) with duck meat may be associated with lack of promotion. A special aroma of the duck meat without appropriate methods of cooking is another problem with the acceptance of the meat. Anatomically, the development of duck feather characteristics make difficult to pluck so that again need particular experience for further processing. However, the prospects of the duck industry remain good and the opportunity for investment will continue to increase. Many farmers in the duck industry continue to expand their scale of production. Both local and central governments promote the tourism programs intensively and the national meeting for most of governmental agendas is also carried out in Mataram.

Table 6. Assessment of duck meat by consumer's opinion (n=40)

Aspects of assessment	Yes	Percentage
Familiarity with duck meat		
Do you know meat ducks?	10	25
Have you tasted duck meat before?	10	25
Limitation		
Price	25	62.5
Availability	30	75
No restriction	40	100
Sensory characteristics		
Duck meat versus chicken meat		
Tastier	10	25
Preferred	10	25
Degree of likeness		
Liked extremely	0	0
Liked moderately	7	17.5
Liked	28	70.0
Disliked	5	12.5

Field survey, 2015

Critical issues to consider

Unlike other Islands of Indonesia, Lombok Island, where Mataram is located, is protective region from the poultry traffic. The frequent outbreaks of poultry diseases such as Avian influenza, Newcastle diseases and other new potential diseases made the local authorities to restrict the importation of fertile eggs and live birds particularly DOD (day old duckling). Whilst the existing hatcheries with small operations are more interested in chickens, quails, and layer ducks than in meat ducks. Producing meat ducks as in broiler chickens involves a range of stages and activities to keep the production cycle. Because meat duck farming is relatively new business, the demand for fertile eggs of this breed is still relatively low. The duck growers have to be self-sufficient. For this reason they tried to import DOD or fertile eggs from neighboring breeders in Java through the sea without undergoing any inspection of the animal quarantine authority. This is the only way for the meat duck growers and traders to survive. Therefore, a breeding centre for developing duck population in particular is essential to save on cost from importing fertile eggs and maintain the sustainability and competitiveness. The most important thing is that government policy and private sectors are needed to resolve these problems when tourist program continues to be promoted.

Conclusions

- Meat duck farming was characterized by lack of technical knowledge and capital. It has not been self-sufficient on ducklings and fertile egg production to maintain the sustainability and competitiveness.
- The high unfamiliarity, taste and method of cooking were constraints to the low development of duck farming.
- There are great potentials and prospects for an improvement of duck production in Mataram along with the introduction and development of tourism.
- Providing an opportunity to meet the growing demand for meat ducks and to be independence is essential by issuing a relevant policy which encourages the duck growers to fulfill their production supports.

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