

## PHILIPPINE MALLARD DUCK PRODUCTION SYSTEM IN NUEVA ECIJA, PHILIPPINES

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### ABSTRACT

**One hundred twelve Philippine mallard duck raisers were interviewed using constructed questionnaires to determine their socio-demographic profile, characterize their production system, associate those production systems to their scale of operation and analyze their common production problems. The survey found that the majority of the duck farms interviewed were considered as commercial scale (68.75%). There was a highly significant association between the scale of operation with some of the production systems employed in the production such as the type of labor, housing materials used, type of feeder and waterer, the emergence of disease outbreak, application of antibiotics, duck products produced as well as record-keeping practices. Moreover, a significant association was also found between the scale of operation and the type of buyer of duck products and animals reared on their farm. Common production problems of duck farmers are associated with limited capital, expensive feeds and the occurrence of diseases. Further and detailed studies for each management system are needed to harness the potential of the duck industry in the province.**

Keywords: backyard duck farms, commercial duck farms, egg production, mallard duck

### INTRODUCTION

Ducks are known to be versatile poultry species; they can thrive in a variety of climates and different nutritional conditions. Aside from economic significance, there are several advantages of raising ducks over chickens such as less space requirement, non-specified housing, resistance to common poultry diseases and requiring only a little attention (Chang *et al.*, 2003). With these, the community, especially in the rural areas preferred raising ducks, particularly for egg production as a source of their livelihood or additional income.

As of January 2021, there are 12.22 million ducks in the country which is 3.6% higher than last year. Central Luzon, with the highest recorded population, accounted for almost 36% of the country's total duck inventory. Consequently, Nueva Ecija as part of this region landed as the second largest duck-producing province in the country with 2.32

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thousand metric tons of production. In addition, this province is also among the highest duck egg-producing provinces (PSA, 2020, 2021). Undeniably, Nueva Ecija plays a significant contribution to the development of the egg-type duck industry in the country.

Despite Nueva Ecija's notable contribution to the egg-type duck industry, drawbacks were also experienced, such as the highly pathogenic avian influenza disease that hit Central Luzon in August 2017. This resulted in the culling of almost 400,000 birds and an estimated daily loss of US\$3.6 million (Lee and Lao, 2018; Salvador *et al.*, 2020). Low implementation of biosecurity, several species reared on the farm, absence of an outbreak monitoring system, lack of knowledge in recognizing the disease and unrestricted trade of poultry products were among the key drivers involved in spreading the highly pathogenic disease. Understanding these leading factors in high-risk areas like Nueva Ecija in terms of their production system and management practices, socioeconomic drivers and epidemiological determinants will minimize the reemergence of the disease concern while saving valuable resources (Salvador *et al.*, 2020). These leading factors will be covered and characterized by this survey study. The results of this study can be utilized to understand the existing production and management practices of mallard duck egg producers to harness its potential and possibly avert the possible reemergence of the highly pathogenic disease as well as to minimize the economic loss in the province.

## MATERIALS AND METHODS

This survey study was conducted in December 2021 in the municipalities of Jaen and Gapan City, Nueva Ecija which have the highest inventory of Philippine mallard ducks based on the data of the Provincial Veterinary Office. The duck inventory of the two municipalities is 38.56% of the total duck population of the whole province. Using the snowball method, in which respondents provide referrals to identify additional participants, the survey study had 112 respondents.

Data collected were analyzed for descriptive statistics, frequency counts and association (chi-square test) between the socio-demographic profile and production system of the duck raisers (Questionnaire 1) using IBM SPSS Statistics software version 27.0 (IBM Corp., 2021).

## RESULTS AND DISCUSSION

Out of 112 duck farmers interviewed, 31.25% were classified as backyard (<100 ducks) and 68.75% as commercial (>100 ducks) duck farms. Table 1 shows the average socio-demographic profile of duck farmers. The observed average age of the duck farmers from backyard operations was quite lower compared with the average age of respondents from commercial operations. Likewise, the average age from both operations was also lower compared to the average age of dairy buffalo farmers and rice farmers which is 49 and over 50 years old, respectively (Alcantara *et al.*, 2022; Palacpac *et al.*, 2022). Meanwhile, almost the same household size of the duck farmers from both operations was noticed. There is a wide gap in terms of gross monthly income between the backyard and commercial duck farmers. Both genders dominated almost the same proportion of duck farmers from both operations. This result was contrary to the findings of Gutierrez (2019) wherein duck farmers in the top-producing regions in the Philippines were dominated mainly by male. The

Table 1. Socio-demographic profile of Philippine mallard duck raisers in Nueva Ecija.

| Socio-demographic<br>Profile of Duck<br>Raisers | Scale of Operation               |                                    |                       |
|---|----------------------------------|------------------------------------|-----------------------|
|   | Backyard<br>(<100 ducks)<br>n=35 | Commercial<br>(>100 ducks)<br>n=77 | Combined<br>n=112     |
| Average age                                     | 39±12.43                         | 44±12.54                           | 42± 2.66              |
| Household Size                                  | 4.2±1.49                         | 5±2.32                             | 4.75±1.57             |
| Gross Family Monthly<br>Income, Php             | 14375.00±<br>6291.53             | 70649.35±<br>22846.03              | 32727.27±<br>22864.14 |
| Gender, %                                       |                                  |                                    |                       |
| Female  | 51.43                            | 51.95                              | 51.79                 |
| Male  | 48.57                            | 48.05                              | 48.21                 |
| Marital Status, %                               |                                  |                                    |                       |
| Married   | 65.71                            | 84.42                              | 78.57                 |
| Single  | 34.29                            | 15.58                              | 21.43                 |
| Highest Educational<br>Attainment, %            |                                  |                                    |                       |
| Elementary Graduate                             | 40.00                            | 23.38                              | 28.57                 |
| High School Graduate                            | 17.16                            | 31.17                              | 26.79                 |
| Elementary<br>Undergraduate                     | 25.71                            | 23.38                              | 24.11                 |
| High School<br>Undergraduate                    | 5.71                             | 11.69                              | 9.82                  |
| College Graduate                                | 5.71                             | 11.69                              | 5.36                  |
| College Undergraduate                           | 5.71                             | 3.90                               | 4.46                  |
| Others  | -                                | 1.30                               | 0.89                  |

findings of this study could rely on the rationale that male members of the household in the area are responsible for the activities outside the home (Hoque *et al.*, 2010). Moreover, the majority of the respondents were married and only a small proportion of them did not finish elementary level which implies that the majority of the duck farmers are literate.

Table 2 shows the business profile of the duck farmers in Nueva Ecija. On average, small-scale duck raisers reared ducks for only about 2.7 years, with a minimum of 5 months up to 10 years of experience. Meanwhile, commercial duck farmers engaged in the industry for 5.8 years, ranging from 9 months up to 40 years. This implied that, as the duck raisers gained experience over the years, they tend to venture into a larger scale of operations. In terms of duck population, backyard duck operations reared 10 up to 90 heads of ducks, while commercial scale operations raised ducks ranging from 100 up to 60,000 heads of ducks. Moreover, the combined average reared ducks of the raisers indicates that commercial or large-scale operations dominated the industry in the province which gives them a higher monthly gross income. This result was supported by the survey study of Chang and Villano (2008), that the returns to duck production were highest in the medium (500-999 layers) and

Table 2. Business profile of the Philippine mallard duck raisers in Nueva Ecija.

| Business Profile                               | Scale of Operation               |                                    |                       |
|--|----------------------------------|------------------------------------|-----------------------|
|  | Backyard<br>(<100 ducks)<br>n=35 | Commercial<br>(>100 ducks)<br>n=77 | Combined<br>n=112     |
| Estimated distance from other poultry farms, m | 165.57±268.55                    | 356.95±648.91                      | 297.14±564.2          |
| Current population of ducks                    | 36±21.27                         | 4765±<br>11538.37                  | 3488±<br>9820.13      |
| Experience in duck production, years           | 2.7±2.19                         | 5.8±7.46                           | 4.84±6.45             |
| Gross Monthly Income from Duck Production, Php | 6229.09±<br>10124.17             | 56044.29±<br>48469.71              | 15419.23±<br>26660.38 |
| Source of capital in duck production, %        |                                  |                                    |                       |
| Own Capital                                    | 97.14                            | 33.77                              | 53.57                 |
| Borrowed from relatives/<br>friends            | 2.86                             | 53.25                              | 37.50                 |
| Borrowed from banks                            | -                                | 12.99                              | 8.93                  |
| Purpose for engaging in the duck production, % |                                  |                                    |                       |
| Additional Source of Income                    | 51.43                            | 48.05                              | 49.11                 |
| Main Source of Income                          | 8.57                             | 48.05                              | 35.71                 |
| Own/ Family Consumption                        | 40.00                            | 2.60                               | 14.29                 |
| Others   | -                                | 1.30                               | 0.89                  |

large (999 and above layers) scale operation. The majority of the backyard duck raisers utilized their own money for their production in order to generate additional sources of income and to produce duck products for their own consumption. Whereas commercial duck farmers borrowed their capital from outside sources such as relatives and friends to sustain and expand their production.

Duck farmers preferred family type of labor over hired ones regardless of their scale of operation. Table 3 shows that there is a highly significant association between the scale of operation and the type of labor employed by the duck farmers in their production. Respondents from backyard operations are less likely to hire farm laborers. This practice is the same as the rice-duck farming system in Bukidnon, in that more family labor is utilized than hired (Barroga *et al.*, 2007). Moreover, parents are found to be responsible in the duck farms and it was also acknowledged that the children of these households had a contribution in providing labor in the operation.

Table 4 shows the housing materials of the duck raisers in Nueva Ecija. Net is the most predominant material used by backyard farmers in constructing duck houses, while a

Table 3. Source of labor in duck farms in Nueva Ecija.

| Type of Labor* | Scale of Operation               |                                    |                   | X <sup>2</sup> |
|----------------|----------------------------------|------------------------------------|-------------------|----------------|
|                | Backyard<br>(<100 ducks)<br>n=35 | Commercial<br>(>100 ducks)<br>n=77 | Combined<br>n=112 |                |
| Family         | 97.14                            | 62.96                              | 73.28             | <0.0001*       |
| Hired          | 2.86                             | 37.04                              | 26.72             |                |

\*Multiple responses

Table 4. Housing materials of the duck raisers in Nueva Ecija.

| Housing Materials* | Scale of Operation               |                                    |                   | X <sup>2</sup> |
|--------------------|----------------------------------|------------------------------------|-------------------|----------------|
|                    | Backyard<br>(<100 ducks)<br>n=35 | Commercial<br>(>100 ducks)<br>n=77 | Combined<br>n=112 |                |
| Cement             | 11.43                            | 55.70                              | 41.96             | <0.0001*       |
| Net                | 62.86                            | 20.25                              | 33.94             |                |
| Wood               | 11.43                            | 20.25                              | 16.96             |                |
| Bamboo             | 2.86                             | .80                                | 3.57              |                |
| Nipa               | 2.86                             | -                                  | 0.89              |                |
| Others             | 8.56                             | -                                  | 2.68              |                |

\*Multiple responses

majority of commercial operations used cement to build their duck facilities. Backyard farmers used locally available materials such as a net that will allow them to move the houses freely near the area where ducks scavenge for their food. Meanwhile, the majority of commercial operations used materials that are more durable and will last long. As a matter of fact, there is a highly significant association between the scale of operations and housing materials. This indicates that the majority of commercial duck farms facilities are more concrete than backyard.

In the tropics, duck layer facilities are not that elaborate compared to layer chickens. Usually, layer chickens are housed in elevated and cage-type houses (Lambio, 2010). Meanwhile, duck layers are usually in an extensive type of housing system, wherein they can efficiently graze their food in the morning and go back to their shed at night.

Table 5 presents the breeding system of the duck raisers in Nueva Ecija. The majority of both scales of operations preferred day-old chicks as their replacement stock, followed by hatching eggs and ready-to-lay (RTL) pullets. While a few numbers of duck farmers from commercial operations bought their stock in the form of a mix of day-old chicks (DOC) and RTL. This observation was opposed to the findings of Gutierrez (2019) that most duck raisers from Central Luzon where Nueva Ecija is located, preferred RTL as their replacement stocks.

Table 6 shows that the majority of the duck farmers in both scales of operations utilized commercially formulated feeds as the primary feed source for their production. This

Table 5. Breeding system of the duck raisers in Nueva Ecija.

| Breeding Practices                 |                              | Scale of Operation               |                                    |                   | X <sup>2</sup> |
|------------------------------------|------------------------------|----------------------------------|------------------------------------|-------------------|----------------|
|                                    |                              | Backyard<br>(<100 ducks)<br>n=35 | Commercial<br>(>100 ducks)<br>n=77 | Combined<br>n=112 |                |
| Replacement<br>stocks*             | Day-old chick (DOC)          | 41.67                            | 43.02                              | 42.62             | 0.87           |
|                                    | Hatching egg                 | 33.33                            | 31.40                              | 31.97             |                |
|                                    | Ready-to-lay pullet<br>(RTL) | 25.00                            | 23.26                              | 23.77             |                |
| Source of<br>Replacement<br>Stocks | Mix of DOC and RTL           | -                                | 2.33                               | 1.64              | 0.24           |
|                                    | Local Market                 | 69.44                            | 55.81                              | 59.50             |                |
|                                    | Private Farm                 | 27.78                            | 43.02                              | 38.84             |                |
| Selection<br>Criteria*             | Own Farm                     | 2.78                             | 1.16                               | 1.65              | 0.35           |
|                                    | Availability                 | 32.65                            | 37.00                              | 35.57             |                |
|                                    | Breed                        | 20.41                            | 30.00                              | 26.85             |                |
|                                    | Weight/Size                  | 30.61                            | 24.00                              | 26.17             |                |
|                                    | Age                          | 8.16                             | 6.00                               | 6.71              |                |
|                                    | Body Conformation            | 6.12                             | 2.00                               | 2.68              |                |
|                                    | Color                        | 2.04                             | 1.00                               | 2.01              |                |

\*Multiple responses

practice is consistent with the findings of Vidad and Duran (2022) since commercially formulated feeds for ducks are locally available in the market. These findings also indicated that the duck farmers in the community are more receptive to new practices and innovation in the duck industry. The results showed that the type of feeder and drinker used by the duck farmers is highly associated with their scale of operation. It is noted that the majority of backyard operations fed their ducks in old tires while most of the commercial farms used plastic tubes as their feeder. Meanwhile, common drinkers used by both operations are pan and jar type and water basin.

Nomadic system or grazing is the most common rearing practice of ducks in some Asian countries (Abraham and Ravindran, 2009; Rahman *et al.*, 2009; Gutierrez, 2019; San-karalingam and Mahanta, 2022). Not surprisingly, this system is still adopted today in the Philippines. Table 7 shows that semi-confinement is the most commonly used rearing system in both operations of the duck raisers in the province. In this system, the ducks graze freely in the morning and are confined in their houses at night. Furthermore, the majority of the duck raisers who utilized the semi-confinement and free-range system, graze their ducks during growing and laying stages in their own backyard or rice field owned by their relatives, friends and neighbors.

Diseases and infections have posed a major threat in the poultry and livestock sector and the duck industry is not an exemption. As a matter of fact, in 2017, the first outbreak of avian flu in the country was detected in some poultry farms in Pampanga and later on this was also identified in Nueva Ecija (Lee and Lao, 2018). Table 8 presents the health practices

Table 6. Feeding system of the duck raisers in Nueva Ecija.

| Feeding System  |                          | Scale of Operation               |                                    |                   | X <sup>2</sup> |
|-----------------|--------------------------|----------------------------------|------------------------------------|-------------------|----------------|
|                 |                          | Backyard<br>(<100 ducks)<br>n=35 | Commercial<br>(>100 ducks)<br>n=77 | Combined<br>n=112 |                |
| Type of Feeds*  | Commercial feeds         | 76.74                            | 75.49                              | 75.86             | 1.0            |
|                 | Snails and insects       | 13.95                            | 14.71                              | 14.48             |                |
|                 | Crops by- product        | 9.30                             | 8.82                               | 8.97              |                |
|                 | Any available leaves     | -                                | 0.98                               | 0.69              |                |
|                 | Swill (left- over foods) | -                                | -                                  | -                 |                |
| Type of Feeder  | Plastic Tube Feeder      | 14.28                            | 27.85                              | 24.11             | 0.0005*        |
|                 | Linear Feeder            | 11.42                            | 18.99                              | 16.96             |                |
|                 | Old Tires                | 34.29                            | 6.33                               | 15.18             |                |
|                 | Sacks                    | 11.43                            | 12.65                              | 11.61             |                |
|                 | Bamboo Feeder            | -                                | 15.18                              | 10.71             |                |
|                 | Ground                   | 14.29                            | 8.86                               | 9.82              |                |
|                 | Others                   | 14.29                            | 10.14                              | 11.61             |                |
| Type of Drinker | Pan and Jar Type         | 43.24                            | 32.93                              | 34.82             | <0.0001*       |
|                 | Water basin              | 27.03                            | 28.05                              | 28.57             |                |
|                 | Linear Waterer           | -                                | 28.05                              | 19.64             |                |
|                 | Old Tires                | 29.73                            | 3.66                               | 12.50             |                |
|                 | Others                   | -                                | 7.32                               | 4.46              |                |

\*Multiple responses

Table 7. Rearing system of the duck farmers in Nueva Ecija.

| Management System             |                      | Scale of Operation               |                                    |                   | X <sup>2</sup> |
|-------------------------------|----------------------|----------------------------------|------------------------------------|-------------------|----------------|
|                               |                      | Backyard<br>(<100 ducks)<br>n=35 | Commercial<br>(>100 ducks)<br>n=77 | Combined<br>n=112 |                |
| Rearing System                | Semi-confinement     | 62.86                            | 54.55                              | 57.14             | 0.37           |
|                               | Total-confinement    | 41.43                            | 42.86                              | 39.29             |                |
|                               | Grazing (free-range) | 5.71                             | 2.60                               | 3.57              |                |
| Stage of Ducks during grazing | Growing and Laying   | 70.83                            | 79.55                              | 76.47             | 0.45           |
|                               | Growing              | 16.67                            | 15.91                              | 16.18             |                |
|                               | Laying               | 12.50                            | 4.55                               | 7.35              |                |

Table 8. Health management practices of the duck farmers in Nueva Ecija.

| Health Management Practices |                                   | Scale of Operation               |                                    |                   | X <sup>2</sup> |
|-----------------------------|-----------------------------------|----------------------------------|------------------------------------|-------------------|----------------|
|                             |                                   | Backyard<br>(<100 ducks)<br>n=35 | Commercial<br>(>100 ducks)<br>n=77 | Combined<br>n=112 |                |
| Disease                     | Yes                               | 11.43                            | 67.53                              | 50.00             | <.0001*        |
| Outbreak                    | No                                | 88.57                            | 32.47                              | 50.00             |                |
| Application of              | Yes                               | 62.86                            | 96.10                              | 85.71             | <.0001*        |
| Antibiotics                 | No                                | 37.14                            | 3.90                               | 14.29             |                |
| Disease                     | Own prescription                  | 82.86                            | 90.91                              | 88.39             | 0.37           |
| Management*                 | of drugs and<br>medicine          |                                  |                                    |                   |                |
|                             | Isolation                         | 45.71                            | 49.35                              | 48.21             |                |
|                             | Consultation<br>with Veterinarian | -                                | 2.60                               | 1.79              |                |
|                             | None                              | 11.43                            | 3.90                               | 6.25              |                |

of the duck raisers in the province, fifty percent of the respondents experienced disease outbreaks which are associated with bird flu. The chi-square test revealed that this outbreak was predominant in commercial duck farms. Furthermore, there was a highly significant association between the scale of operation and the use of antibiotics. It is observed that the application of antibiotics is most frequent in commercial duck farms. The majority of the respondents from both operations used antibiotics during the brooding stage and stress period.

Table 9 shows that fresh eggs are the top duck product produced by both operations and this was followed by culled layers. Therefore, there was an observed significant association between the duck product produced and the scale of operations. Only the production of fresh eggs is the sole purpose of rearing ducks in backyard operations. This finding was the same with some provinces in the Philippines such as the basic duck producers from Laguna who preferred to sell fresh eggs alone (Arrosa and Piadozo, 2018). It was also noted that there was an observed significance in a type of buyer with the scale of operation. Salted egg processors are the main buyer of backyard duck farmers, while most of the vendors of duck products in the public market acquired their stocks from commercial duck farmers.

Record-keeping practices of the duck raisers in Nueva Ecija are presented in Table 10. This study found that there was a significant association found between the scale of operation and record-keeping practices of the duck farmers. Only a few numbers from both operations kept records in their production.

The data evidently show that record-keeping is a rare practice in backyard duck farms. This result is consistent with the native chicken farmers in Palawan, wherein they never kept a record of their production (Lopez *et al.*, 2014). This practice could be attributed to the fact that some of the duck products produced by the backyard farmers were only for their own consumption.

Table 11 shows that biosecurity protocol is not a common practice in both operations of duck farms, especially in backyard operations where a significant association was



Table 9. Marketing system of the duck raisers in Nueva Ecija.

| Marketing Practices |                            | Scale of Operation               |                                    |                   | X <sup>2</sup> |
|---------------------|----------------------------|----------------------------------|------------------------------------|-------------------|----------------|
|                     |                            | Backyard<br>(<100 ducks)<br>n=35 | Commercial<br>(>100 ducks)<br>n=77 | Combined<br>n=112 |                |
| Duck<br>Product*    | Fresh eggs                 | 86.96                            | 51.81                              | 60.00             | 0.0003*        |
|                     | Culled layers              | 8.70                             | 25.30                              | 21.90             |                |
|                     | Salted eggs                | -                                | 19.28                              | 15.24             |                |
|                     | Embryonated<br>egg (Balut) | -                                | 3.61                               | 2.86              |                |
| Buyer               | Public Market              | 40.91                            | 67.50                              | 61.76             | 0.02*          |
|                     | Salted egg<br>processors   | 54.55                            | 30.00                              | 35.29             |                |
|                     | Chinese<br>Restaurant      | -                                | 2.50                               | 1.96              |                |
|                     | Neighbors                  | 4.55                             | -                                  | 0.98              |                |

\*Multiple responses

Table 10. Record-keeping practices of the duck raisers in Nueva Ecija.

| Record-Keeping<br>Practice | Scale of Operation               |                                    |                   | X <sup>2</sup> |
|----------------------------|----------------------------------|------------------------------------|-------------------|----------------|
|                            | Backyard<br>(<100 ducks)<br>n=35 | Commercial<br>(>100 ducks)<br>n=77 | Combined<br>n=112 |                |
| Yes                        | 97.14                            | 75.32                              | 82.14             | 0.006*         |
| No                         | 2.86                             | 24.68                              | 17.86             |                |

Table 11. Biosecurity practices of the duck raisers in Nueva Ecija.

| Biosecurity Practices         |      | Scale of Operation               |                                    |                   | X <sup>2</sup> |
|-------------------------------|------|----------------------------------|------------------------------------|-------------------|----------------|
|                               |      | Backyard<br>(<100 ducks)<br>n=35 | Commercial<br>(>100 ducks)<br>n=77 | Combined<br>n=112 |                |
| Biosecurity<br>Implementation | Yes  | 11.43                            | 25.97                              | 21.43             | 0.13           |
|                               | None | 88.57                            | 74.03                              | 78.57             |                |
| Other Animals<br>Reared       | Yes  | 100.00                           | 89.61                              | 92.86             | 0.05*          |
|                               | None | -                                | 10.39                              | 7.14              |                |

found. This result can be associated with the observed disease outbreak that occurred in the fifty percent of duck farms interviewed. In fact, the majority of duck farmers reared other animals on their farms such as dogs, cats and other poultry species including muscovy ducks and native chickens. These findings conform with the biosecurity assessment of Tanquilil (2020) in duck farms in Candaba, Pampanga, the province adjacent to Nueva Ecija, wherein a majority of the farms had poor compliance with basic biosecurity measures.

Table 12 shows the average rating of duck farmers on their common production problems using the Likert scale. Similar to other enterprises, duck raisers encountered several problems associated with their production. Duck farms classified as commercial level are somewhat having capital-related problems wherein the majority of them are having difficulty in sustaining and expanding their production. As commercial feed prices are increasing over time, both operations are struggling with the source and cost of feeds as it is accounted for the largest cost of the production. Moreover, some of the identified problems of commercial duck farmers are associated with disease and infection, since this is a major threat that could seriously affect their production. These problems of Nueva Ecija duck farmers were somewhat similar to the identified problems of duck farmers in Bangladesh, wherein the lower price of duck products, high cost of feeds and lack of training were the top problem found in the area (Alam *et al.*, 2013). Despite the constraints that they encountered in their production, the majority of the duck farmers are willing to expand their operation.

Because of the rice fields which are suited for rearing ducks, duck farmers in Nueva Ecija are willing to expand their operation despite the threat posed by the different

Table 12. Common production problems of duck farmers.

|   | <b>Backyard<br/>(&lt;100 ducks)<br/>n=35</b> | <b>Commercial<br/>(&gt;100 ducks)<br/>n=77</b> | <b>Combined<br/>n=112</b> |
|---|--|--|---------------------------|
| Lack of capital to sustain the production                   | 1.88   | 3.59   | 3.06                      |
| Lack of capital to expand the production                    | 1.57   | 3.03   | 2.58                      |
| Lack of quality breeder stocks                              | 1.45   | 2.09   | 1.89                      |
| Feeds are not enough to sustain the egg production of ducks | 3.17   | 3.70   | 3.53                      |
| Expensive feeds   | 3.66   | 4.22   | 4.05                      |
| Occurrence of infections and diseases                       | 1.42   | 3.12   | 2.59                      |
| No access to market outlets (poor marketing of products)    | 1.00   | 2.01   | 1.69                      |
| Restrictions in transporting of products                    | 1.05   | 2.72   | 2.20                      |
| Received complain from the community                        | 1.00   | 1.22   | 1.15                      |

1=Strongly disagree; 2=Slightly disagree; 3=Neither agree nor disagree; 4=Slightly agree; 5=Strongly agree

production problems. This production system in Nueva Ecija should be sustained for the benefit of the community, which could be the avenue to improve the lives of the people in the rural areas. The results of this study could be utilized to develop any innovation and intervention to improve the production performance of the Philippine mallard duck in the country. Moreover, this could be used also to minimize the re-emergence of diseases in high-risk areas by assessing the management system of the duck raisers. Further and detailed studies for each management system should be prioritized to harness the potential of the duck industry in the province as well as in the country.

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