A qualitative study of small-scale layer farms on a tropical island Malang Indonesia

Nanang Febrianto[1,*], *Budi* Hartono[1]

[1]Faculty of Animal Science, Universitas Brawijaya. Jl. Veteran Malang, 65145, East Java, Indonesia

Abstract. The research was conducted at Malang Regency, East Java, Indonesia, with the research purpose of understanding the amount of small-scale income and characteristics generated by layer farmers. Data collection from February to March 2020 used the survey method. The total sample was 109 respondents determined by the purposive sampling method with the consideration of laying farmers with 2.000 – 7.666 birds for at least three years. The data collection consisted of primary and secondary data. Data were analyzed using descriptive analysis. The result showed that the success rate of the livestock business is inseparable from the characteristics of the farmers. Characteristics of respondents observed in the research included age, education, occupation, breeding experience, and the number of family members. The conclusion of this research is the livestock population was 7,667-15,333 birds, the age around 40–49 years, educational level was elementary school, occupation as farmers, the farming experience was 11-15 years and family member of farmers was 5 people.

1 Introduction

Chicken egg production in Indonesia has a high potential; in 2019, the production reached 1,485,688 tons, growing an average of 8.55% during the period from 2016 to 2019. East Java is one of the biggest chicken egg-producing areas in Indonesia. Statistical data shows that the population of laying hens in East Java is around 69.94% of the total population in Indonesia. The population of laying hens for the last five years in East Java shows that from 2014 to 2019, there has been an increase. The highest population occurred in 2019 amounted to 43.221.466 birds and the lowest in 2018 was 37.035.251 birds, while the population in 2015 was 40.268.631 birds; in 2016, it was 43.066.361 birds, in 2017 it was 41.156.842 birds [1]. The increasing population from year to year indicates that Indonesia still lacks eggs for domestic needs. Therefore, efforts to increase wide-open production and domestic egg production can fill the export market.

Malang Regency has the potential to support livestock business, starting from diverse types of livestock, abundant feed, human resources, and supporting infrastructure. Following the vision of the animal husbandry and animal health service in Malang Regency, the livestock subsector is directed to realize competitive and resource-based

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* Corresponding author: nanangfeb@ub.ac.id

livestock agribusiness. These conditions are characterized by the ability to meet the needs of the community, the ability to adjust production patterns to market demand, the ability to develop the region, provide employment opportunities, income, and improve living standards and play a role in economic growth. The program can provide opportunities for laying hens to increase their livestock population, which is expected to support the government's vision.

Laying hens is a leading commodity in Malang regency in terms of population size and production. Malang's laying hen's population is the second largest of the total laying hen's population in East Java Province as many as 43.221.466 birds [1]. The population of chicken eggs in the last 3 years in Malang Regency shows 16.644.990 birds (in 2017), 17.571.738 birds (in 2018) and 27.642.192 (in 2019). The increase in population is related to the amount of egg production produced. Chicken egg production in 2017 amounted to 25.080 tons, in 2018 amounted to 27.510.13 tons and in 2019 amounted to 42.198.64 tons [2]. Based on this cased, the purpose of this research was to determine the profile of small-scale laying hens in Malang Regency.

2 Materials and methods

The research was carried out in the Malang Regency. The determination of the location was carried out using the multistage sampling method. Determination of the sample in stages starting from the provinces, districts, sub-districts and villages intentionally based on the population. Malang Regency was chosen as the location by considering the second-largest laying hens centre in East Java with a population of 5,765,796 individuals [3]. The population of laying hens in the Malang Regency is shown in the following Table 1.

Table 1. The population of laying hens in Malang Regency (birds)

Sub-District	Amount (birds)
Tumpang	1.463.720
Singosari	723.973
Lawang	624.083
Turen	418.801
Poncokusumo	348.087
Wajak	279.827
Dampit	206.661
Kalipare	181.574
Jabung	168.413
Pakis	122.962

Source: BPS-Statistics of Malang Regency (2020)

The research was conducted by a survey method, where the samples were taken from one population and used a questionnaire. The number of respondents as many as 109 people

were determined purposively by considering the experience of raising a minimum of 3 years and a minimum livestock population of 2000 animal, then divided into three strata based on the scale of business. The data collected is primary data and secondary data. Primary data was obtained by observation, interviews, and giving questionnaires to respondents. Secondary data was taken from the statistical data collection agency and the local Animal Husbandry Office. The data obtained were analysed using the input-output approach and qualitative descriptive analysis, namely explaining or describing primary and secondary data both qualitatively and quantitatively.

3 Results and discussion

3.1 Livestock condition in Malang Regency

Animal husbandry in Malang Regency consists of cattle, dairy, and poultry. In 2016-2019, the largest population of beef cattle was goats, beef cattle, and sheep. In 2019 the goat population was 253,209 head (up 2.87% per year), then beef cattle 83,660 head (up 3.61% per year), and sheep 33,776 head (up 2.58% per year). Dairy cattle were recorded only 234,481 dairy cows in 2019, with an average annual increase of 5.23% (Table 2). An increase in the selling price of products that impact income encourages farmers to increase their livestock population. The category of small livestock includes goats, sheep, pigs, and poultry categories namely free-range chicken, laying hens, broilers, ducks, and ducks all have increased the population. The increase in population from livestock ownership is one indicator that livestock businesses can increase farmers' incomes.

Table 2. Livestock population of Malang Regency in 2016-2019 (head)

Type of Livestock	2016	2017	2018	2019
Cattle	199.453	212.821	223.717	234.481
Dairy	75.683	78.029	81.150	83.660
Buffaloe	1.266	1.127	1.150	1.164
Horse	626	836	861	882
Goats	235.121	240.823	248.048	253.209
Sheep	31.496	33.284	33.284	33.776
Pig	12.241	12.826	13.262	13.581
Range chicken	2.201.166	2.254.982	2 318121	2.367.744
Broilers	17.571.738	27.642.192	28.335.754	28.927.203
Laying hens	3.005.562	5 597.860	5.765.796	5.912.692
Duck	400.472	468.481	481.130	492.632
Entog	400.287	420.892	432.256	442.125
Rabbit	38.505	40.667	41.590	42.606
Quail	156.288	158.055	161.690	165.412

Source: BPS-Statistics of Malang Regency (2020)

Laying hens is a superior commodity in Malang Regency based on the amount of egg production and its population. Egg production in 2019 reached 44,730 tons (19.55%) out of total production of 228,763.59 tons (Table 3), followed by meat 41,066.70 tons (17.95%) and milk 142,966.10 tons (62.50 %). The amount of broiler egg production is related to the size of the population which reached 5,912,692 heads spread in districts in Malang Regency.

Table 3. Malang Regency animal husbandry production in 2016-2019 (tons)

Commodity	2016	2017	2018	2019
Meat	22.325,74	38.885,69	39.949,12	41.066,70
Egg	27.510,13	42.198,64	43.452,20	44.730,79
Milk	117.253,67	132.052,01	137.324,46	142.966,10

Source: BPS-Statistics of Malang Regency (2020)

3.2 Characteristics of small-scale layer chicken farmers

1. Farming Scale

The magnitude of the business scale is influenced by the economic capacity, the experience of farmers, and business cooperation established by farmers. Farmers who succeed in managing their business will gradually be able to increase the scale of their business because the profits derived from livestock farming are used to increase the livestock population.

Table 4. Business scale classification of laying hens in Malang Regency

Farming Scale	Population	Percentage (%)	Respondent (people)
Small scale	2.000 – 7.666	70,64	77
Medium scale	7.667 – 15.333	18,35	20
Large scale	> 1.5334	11,01	12

Most of the respondents have a business of chicken farmers with a population scale of 2000-7666 as many as 70.64% (77 people). The majority of laying hens farmers have a business scale of 2,000-7,666 because the size of the population is related to the amount of investment and economic capability that the farmers have. The scale of livestock business is influenced by investment factors, namely: capital, cages, land, equipment. Initial investment capital will affect the amount of population to be nurtured and will have an impact on the use of production costs. [4] stated that a large number of broilers that are raised determines the amount of income and profits of broiler breeding businesses, the larger the scale of business, the higher the level of income and efficiency.

2. Age

The age of farmers is very influential on physical strength and knowledge because the livestock sector uses more human labor in its maintenance and technological development that will support the success of the chickens that it raises.

Table 5. The age classification of laying hen's farmers in Malang Regency

Age	Percentage (%)	Respondent (people)
< 29 years	11,0	12
30-39 years	22,0	24
40-49 years	36,7	40
> 50 years	30,3	33

Laying chicken farms are mostly managed by farmers aged 40-49 years as much as 36.7% (40 farmers). At the productive age, farmers tend to have a strong physique, able to work longer and energetic in managing their business. Also, productive-age farmers are braver in taking risks in trying innovations, because they have a curiosity about new knowledge and the interest to adopt technology is getting stronger. Productive farmers have excellent morale which can affect the productivity of the laying hen's business. [5] states that farmers' age and education have a positive impact on the willingness to adopt innovations from technology in livestock raising to increase profits from their livestock businesses.

3. Education

Farmer's education level influences their way of thinking and their level of acceptance of innovation and technology. The higher the level of farmer education, the better the quality of human resources in adopting innovations and applying the latest techniques in the management of laying hens.

Table 6. Classification of laying hen's farmers education in Malang Regency

Education	Percentage (%)	Respondent (people)
Elementary school	52,3	57
Junior high school	31,2	34
Senior high school	7,3	8
Bachelor	7,3	8

The education level of respondents is still relatively low because most of them are elementary school graduates as much as 53%. Respondents reasoned that the high cost of education and the location of the school from where they live is reluctant to continue to higher education. The majority of farmers are poorly educated so that they will be a barrier to accepting and adopting innovations or technologies. This situation will have implications

for the development of laying hens and result in low productivity. This is reinforced by the [6] that the education of the agricultural workforce is usually characterized by low levels of education and productivity. In 2013, 39.85% of the workforce in the agricultural sector were elementary school graduates. [7] added that the higher the education level of the farmer, the input from the livestock business could increase because the farmer was more likely to be able to adopt new technology in his livestock business. The character of a farmer's high education tends to make it easy for farmers to accept the latest innovations.

4. Occupation

Occupation is an activity carried out by farmers to meet their needs and desires. The work is divided into two, namely the main work and side jobs. The main work is work whose routine is prioritized by respondents with more time.

Table 7. Occupation classification of laying hens farmers in Malang Regency

Occupation	Percentage (%)	Respondent (people)
Farmers	56,0	61
Seller	17,4	19
Farmer larbor	12,8	14
Government employees	13,8	15

The majority of respondents work as farmers as 61 respondents (56%). The topographic conditions and tropical climate of Malang Regency are very supportive of agriculture and animal husbandry. Besides, the existence of abundant natural resources caused the livelihoods of respondents to be mostly farmers and carried on for generations. The economic aspects of work can improve the economy based on financially, and socially the job can increase the needs and desires.

5. Farming Experience

The experience of raising livestock shows the length of time a farmer does his business. Experience is a farmer's knowledge gained through routine daily activities or events that have been experienced. Farmers who have long experience in managing their businesses have better knowledge, attitudes, and skills when compared to new farmers.

Table 8. Classification of experience in raising laying hens in Malang Regency

Farming experience	Percentage (%)	Respondent (people)
< 5 years	15,6	17
6-10 years	27,5	30
11-15 years	33,9	37
> 16 years	22,9	25

Farmers have experience of raising between 11-15 years of 33.9% (37 farmers). The loyalty of respondents in raising livestock is very high. Farmers who are experienced in dealing with business problems know how to overcome them, while those who lack experience will have difficulty in overcoming business problems. The experience of breeding influences the yield of production because the longer the experience of raising livestock, the farmer will get used to the problems that occur during the maintenance. The results of the research are reinforced [8] findings that the longer the experience of raising livestock, it tends to make it easier for farmers to make decisions related to the technical implementation of their livestock business. That is because the experience is used as a guideline and adaptation to a problem that is sometimes faced by farmers in the future.

6. Number of family members

The number of family members is an essential factor in the livestock business. Family members as human resource assets, especially those of productive age and help in the livestock business, on the contrary, family members can become a burden on their families' lives if they are not actively working.

Table 9. Classification of the number of members of laying hens in Malang Regency

Numbers of Family Members	Percentage (%)	Respondent (people)
2 members	7,3	8
3 members	15,6	17
4 members	16,5	18
5 members	39,4	43
> 6 members	21,1	23

The majority of research respondents had a total of 5 family members of 39.4% (43 people). A large number of family members is due to the average age of the farmers who are still in productive age, and some children from the family are still joined with their parents. A large number of family members has a positive value that is a lot of labour available to help work. On the contrary, the negative aspect of a large number of family members is the expenditure and family dependents will be higher. This is consistent with the opinion of [9] states that the number of family members is related to the labour used in the livestock business. The number of family members of farmers can affect livestock business activities because it will supply labour that helps farmer activities.

4 Conclusion

The conclusion of this research showed that the farmer have livestock population 7,667-15,333 birds, the age around 40–49 years, educational level of farmers was elementary

school, occupation as farmers, the farming experience was 11-15 years and family member which the most members as farmers have were 5 people.

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