

# Potential Development and Marketing of Jawa Super Chicken Eggs to Promote Sustainable of Food Security at Ngoro-Oro Village, Gunungkidul during Covid-19 Pandemic

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**Abstract** The Covid-19 pandemic severely affect the economic sector especially on food security and purchasing power. Based on the program in 2019 and 2020, it has been found that Jawa super hen can lay up to 20-25 eggs/hen/month with good maintenance and feeding. This study aimed to solved the food security problem in Ngoro-oro village by educating the villagers about how to market their Jawa super chicken eggs as an effort to improve the economic standard of the community. The activity was carried out for 7 months included producing alternative chicken feed using black soldier fly larvae, post-harvesting management, and evaluating consumer egg preference survey using google form which spread randomly over some different communities to determine the best promotional strategy. The Ngoro-oro villagers eagerly attended both of the trainings. Some of them even succeeded in developing maggot from the black soldier fly which can be used to produce as an alternative feed for poultry. We got 126 respondents from the consumer egg preference survey. We found that around 60% respondents prefer to consume medium size egg, light to dark brown egg and around 80% respondents are interested to try consuming Jawa super eggs. Most of the respondents prefer simple and easy to read label as well as carton-based packaging for the eggs. Collecting all the information together, we found that Jawa super eggs may have potency to be sell in the market as medium size brown eggs supported by a good brand, packaging, and promotion strategy.

## 1. INTRODUCTION

One and a half years has passed since the emergence of the Covid-19 pandemic occurred all around the world and it has not ended yet. Indonesia became one of the most affected country because of the pandemic. Up to the fifth of November 2021, there has been 4,24 million cases of Covid-19 in Indonesia with 143 thousand death tolls (WHO, 2021). To overcome the further spreading of the Covid-19, the government have done various efforts such as lockdown, obligation to wear a mask, social distancing, and getting vaccinated to control Covid-19 burden in the country (Alagoz et al., 2021; Zulkipli & Muharir, 2021). The pandemic affects all sectors especially the economic sector which caused decreasing people's purchasing power and the food security (Santosa, 2020).

To fulfil their protein demand, the society manage a strategy to consume cheaper but sufficient nutritional value protein sources such as eggs.

Chicken eggs contain a complete nutritional value such as proteins, fats, vitamins, and minerals (Agustina, Thohari, & Rosyidi, 2012). The vitamins contained in chicken eggs are vitamin A, vitamin B, niacin, thymine, riboflavin, vitamin E, and vitamin D (Ramadhani, Herlina, & Pratiwi, 2018). According to prior research by Yuwanta (2010), chicken eggs contain 12.8% protein, 11.8% fat content, and 1% carbohydrate. Prior research data showed that the proteins in kampung chicken egg yolk is 1229.5 mg/mL and the proteins in kampung chicken egg white is 94.507 mg/mL (Ramadhani et al., 2018).

In the previous program, we studied one of prospective egg-producing hen called the Jawa Super chicken or the Joper chicken. Jawa Super chicken is a product of a crossbred between layer hen and Bangkok rooster (Jacob, Leke, Sarajar, & Tangkau, 2019). The productivity of Jawa Super chicken's egg is relatively high with the number of eggs reaching 20-25 eggs/hen/month with correct maintenance and feeding (Saragih *et al.*, 2020). Thus, it is a promising chance to develop Jawa Super hen as an alternative of egg-producing hen. So far there has been various hurdles in local eggs production such as low eggs production amount, small sizes, and small weights. Different from the local chicken, layer chickens are capable of producing eggs almost every day with large sizes and weights. According to a prior research, kampung hens are known to lay about 70 eggs per year while layer hen lays 300 eggs per year (Nataamijaya, 2010; Saragih *et al.*, 2020).

Ngoro-oro village is one of the villages in the Patuk district, Gunungkidul Regency, Daerah Istimewa Yogyakarta. Geographically, Ngoro-oro village is located between 7°51'-7°54' south latitude and 110°37'-110°39' east longitude at the height of 160 to 828 m above the sea level. Ngoro-oro village has spans of hilly region with a temperature averaging 30°C and rainfall of 122 mm/year. This region has 753,79 acres of land with half of it being dry fields and rice fields for agriculture. The livelihood of Ngoro-oro village residents is dominated by farmer of about 31,38%. There are more than 20% residents jobless or do not have a job yet.

As a follow up to the previous program, the current program was aimed to train the community to produce an alternative chicken feed from black soldier fly larvae. Besides that, this program also purposed to train the community on post-harvest management of Jawa Super chicken eggs such as packaging, labelling, and promotion strategy to expand the market and increase the price of Jawa Super chicken eggs. Further, this program expected to increase the Ngoro-oro village, Patuk, Gunungkidul residents' food security especially in overcoming the Covid-19 pandemic and also improving the economic standard of the community.

## 2. METHOD

The development of Jawa Super chicken as eggs-producer hen's program was done from April to November 2021 in Ngoro-oro village, Patuk, Gunungkidul, Daerah Istimewa Yogyakarta. All activities of this community service program were carried out through several stages such as training on producing alternative chicken feed from black soldier fly larvae, training on post-harvest management of Jawa Super egg as a strategy to increase market potency and consumer egg preference survey.

### 2.1 Training on producing alternative chicken feed from black soldier fly larvae

Training on producing alternative chicken feed from black soldier fly larvae was held on June 6th, 2021 and attended by 19 residents of Ngoro-oro village. Training began with a presentation about the potency of black soldier fly larvae as poultry feed which content high protein and fat, then continued with a demonstration of making alternative chicken feed.

In the practice of making alternative chicken feed, the dry black soldier fly larvae were crushed with grinding stone and the commercial chicken feed was measured using scale. Next, two kilograms of the commercial chicken feed (BR) mixed with 40 grams of dry black soldier fly larvae powder.

### 2.2 Training on post-harvesting management: packing, labelling, and promotion strategy

Training in post-harvesting management of Jawa Super egg was held on September 4th, 2021 and attended by 16 residents of Ngoro-oro village. This training started with a presentation about the aim of packing, good packaging designs, labelling, and promotion strategy of Jawa Super egg. In this program, a questionnaire was also made using Google Form which spread over some different communities to find out consumer preferences when buying eggs. The responses of this questionnaire were informed to Ngoro-oro village community as a consideration for developing their brand and setting a promotion strategy.

## 2. RESULT AND DISCUSSION

The first activity about training on producing alternative chicken feed from black soldier fly larvae was well received by the residents of Ngoro-oro village. Because, there was prior familiarity between the residents and some of the researchers due to the previous programs has been done at the village. The training was attended by 19 residents of Ngoro-oro village, who's familiar in the sector of poultry farming as their profession. During the training session shown on Figure 1., the residents were attentive and active asking questions regarding the alternative chicken feed from black soldier fly larvae to common practice of the best way to maintain the poultry farm. Statements from two of the residents, Mr. Sukasto and Mr. Ristanto, which have successfully applied the usage of alternative chicken feed from black soldier fly larvae to their poultry farm and experienced the positive effects of it, further convinced the other residents to also try applying the alternative chicken feed to their own poultry farm.

Appropriate and optimal feed intake is important to increase chicken productivity. Previous study by Mulyono and Purnomo (2013) reported that a mixture of concentrate, milled corn, and rice bran with a ration 1:2:2 suitable for Jawa chicken feed. Moreover, Najib *et al.* (2014) reported that supplementation of corn oil and linoleic acid increased egg size and weight. In some countries, black soldier fly larvae already developed as an alternative feed for laying hens because contain high protein and fat around 35 and 30%, respectively (Dortmans, Diener, Verstappen, & Zurbrugg, 2017).



**Figure 1.** Villagers were paying attention on the training of making the alternative chicken feed from black soldier larvae's demonstration (a) and presentation (b)

Jawa super (joper) chicken as the result of hybridization between layer hen and bangkok rooster, is enable to produce eggs around 20-25 eggs/hen/month. Eggs produced by jawa super (joper) hen have an in-between characteristic and measurement eggs produced by layer hen and kampong hen. For example, jawa super hen's egg has a dominantly light brown color (Figure 2.), whereas layer egg color is brown and kampong egg color is white. Furthermore, the size of jawa super hen egg is medium size in-between the layer and kampong egg. The weight of jawa super hen's egg is around 55.684 g, whereas the weight of layer and kampong chicken's egg are around 66.918 g and 53.440 g, respectively.



Figure 2. Eggs produced by jawa super (joper) hen

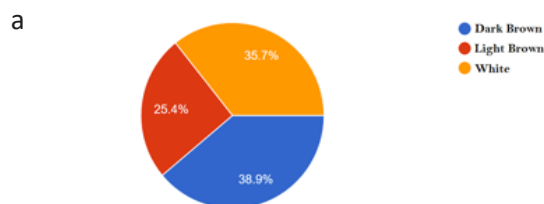
Indonesians have the perception that kampong eggs possess better nutritional value than layer chicken eggs. Some reasons why not everyone can consume kampong hen eggs is because of their higher price and low productivity compared to layer chicken eggs. Hence, for convenience, price, and availability, most people prefer layer chicken eggs for daily consumption. Now, with the higher performance of jawa super (joper) hen to produce egg and closer characteristics to kampong chicken eggs, the jawa super chicken eggs may have potency to become another egg preference among the people. Hence, before plunging into the market, the villagers need to have a brand, packaging, and promotion strategy. The training in post-harvesting management aimed to educate the villagers about good packaging designs, the importance of a brand, and promotion strategy (Figure 3.). We gave some examples about the type of packaging, several designs of labelling, and promotion strategy. Promotion and marketing strategies can be done such as selling the jawa super chicken eggs first to the local supermarket then if in a week some of them weren't sold, they can distribute those eggs to traditional market and sell them with lower price, besides also do promotion through social media to increase the exposure of the product to the consumer and increase the marketing aspect as well.



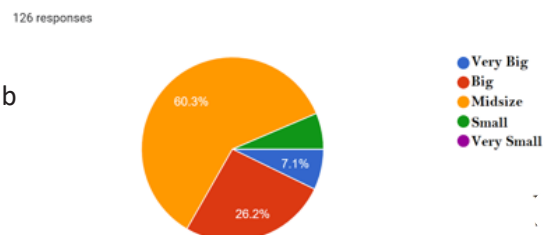
Figure 3. Post-harvesting management of jawa super chicken eggs' training presentation (a) attended by the villagers (b)

In addition to the post-harvesting management training, we did a survey with google form to understand the consumer's knowledge and preference toward the chicken egg they consume daily (Figure 4.). The survey was conducted among 126 respondents over some different communities who live in Yogyakarta, Central Java, West Java, Borneo, Papua, and other area in Indonesia, with 65.1% respondents were female and 34.9% were male. The education level of respondents was high school degree 27%, bachelor degree 47.6%, and master degree 16.7%. The age distribution of the respondents was dominated by the 21 – 30 years old respondents 44%, the 31 – 40 years old respondents 26%, and a variety of age groups 29%.

Based on the survey, more than half of the respondents prefer layer eggs with dark brown color and medium size, because of cheap and easy to find. From the market there were information that the price of layer egg was around 1,500 IDR/egg, the price of kampong egg was around 2,500 IDR/egg, and the price of jawa super egg was around 1,800 IDR/egg. There were some possibilities why the consumer prefers layer egg rather than jawa super egg i.e since the color of jawa super egg dominantly light to dark brown almost similar with layer egg whereas the size almost similar with the kampong egg (Saragih et al., 2020). Another reason could be drawn from our survey which was the consumer have no or little information about jawa super egg. Correspondingly, the packaging design opted by 64.3% respondents was the carton-based package, because of eco-friendly, easy to carry, simple, and elegant. Meanwhile, only 23.8 % respondents prefer the woven bamboo basket and 11.9% respondents prefer plastic-based packaging. As for label design, the respondents have an even preference among the 4 designs. The design number 2 selected by 34.1% respondents because of simple, interesting, and easy to read. From this survey we found that around 80% of the respondents never consume jawa super chicken egg before. However, surprisingly they interested in trying to consume jawa super eggs (Figure 4.). Since jawa super egg is not popular yet in the market, it has its own attraction for consumers who have never consume it.



What egg size do you prefer?





**Figure 4.** Consumer egg preference survey: egg color (a), size (b), packaging design (c), label design (d), and interest in trying Jawa super chicken egg (e)

Some studies reported that there are a lot of factors which must be analysed to support the success of egg trading. Syafriardi and Iskandar (2006) stated that the local farmer usually faced difficulties to fulfil the demand and has no standard price. Besides, they also faced some threats such as price fluctuation, no subsidy from the government, and competitor. Widyantara and Ardani (2017) reported that the inefficient of egg production as well as low promotion of the chicken farming also cause the reduction of eggs trading in local farmer. In this program, we understand that the promotion is one of the most important part for marketing, thus developing simple and elegant designed may attract the consumer to buy the Jawa super eggs. Besides, the increasing of society awareness on nutrient requirement cause increasing eggs demand (Widyantara and Ardani, 2017). Sugiharto (2008) and Pinto, Hapsari, and Hartadi (2016) stated that smooth distribution from the farmer to consumer

affect the success of egg marketing. They believe that increasing corporation between local farmer and industry may support the marketing strategy. We believe that in the future, egg production and marketing still became the most promising business. Thus, many innovations to increase the egg production capacity, egg quality, and promotion strategy are needed.

#### 4. CONCLUSION

Collecting all the results together, we can conclude that both of the training that have been done is well received by the villagers as they are eager to start selling their Jawa super egg to the market. Good packaging, label, and promotional strategies will support the Jawa super chicken eggs marketing. Not only that, because of the uniqueness of Jawa super chicken egg, possibly they also can have their niche in the market and may help to solve the problem of food security while also improving the economic standard of the community.

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#### CONFLICT OF INTERESTS

All authors declare that there are no conflicts of interest.

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