



# Performance of Ducks in the Early Phase of Laying Eggs Fed Ration Containing Pests of Ponds

Ahmad Wadi <sup>a\*</sup>, Nurjannah Bando <sup>b</sup>, Fitriana Akhsan <sup>a</sup>  
and Basri <sup>a</sup>

<sup>a</sup> Animal Husbandry Department, Animal Feed Technology Study Program, Pangkep State Polytechnic of Agriculture, Indonesia.

<sup>b</sup> Animal Husbandry Department, Agribusiness of Animal Study, Pangkep State Polytechnic of Agriculture, Indonesia.

## Authors' contributions

*This work was carried out in collaboration among all authors. Author AW conducted field researches, made the literature review, analyzed and interpreted result, revised the manuscript and conducted of the correspondence of the submitted paper. Authors FA and Basri both of them conducted field researches, put the comment of the manuscript, performed the statistical analysis, data analysis and drew conclusions. Author NB conducted field researches and writing the manuscript, especially introduction. All authors read and approved the final manuscript.*

## Article Information

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## ABSTRACT

**Aims:** The study aimed to determine the effect of pond pests based rations on the performance of ducks in the early phase of laying eggs.

**Study Design:** Complete randomized design (RAL) consisting of 3 treatments each with 3 replications.

**Place and Duration of Study:** The research was conducted from September 2020 to October 2020 at the Polytechnic of Agriculture Pangkep State, Pangkep regency, Indonesia.

\*Corresponding author: E-mail: awadi15@yahoo.com, awadi15@yahoo.co.id;

**Methodology:** A total of 45 ducks aged 6 months were kept for 30 days, each experimental unit with 5 ducks. This study used a completely randomized design (CRD) consisting of 3 treatments and 3 replications, with a treatment arrangement, namely P0 = Maintenance using commercial feed; P1 = P0 + 5% pond pests and P2 = P0 + 10% pond pests. The performance parameters observed in the study were ration consumption, egg production and egg weight.

**Results:** The maintenance of ducks in the early phase of laying eggs that received pond pests did not have a significant effect ( $P > 0.05$ ) on egg production performance.

**Conclusion:** The conclusion in this study is that pond pests can be an alternative feed to the level of 10%.

*Keywords: Ducks; laying eggs; performance; pond pests.*

## 1. INTRODUCTION

The need for animal protein increases over time. The increase in demand for animal products occurs in tandem with an increase in income and public welfare. People in middle to upper economic conditions have high nutritional awareness. The increase in demand must also be accompanied by adequate production. The production of various livestock / poultry products must prioritize both quality and quantity.

The development of ducks is part of national animal food security. The maintenance of ducks has a role in meeting the animal protein needs of the Indonesian people. Ducks are one type of poultry that can keep pace with the growth rate of animal protein needs because they have advantages among other local birds. The system of keeping ducks tends to be easier than other types of poultry. Ducks have high adaptability and are not selective to the feed given. However, the feed requirement of ducks often cannot be met due to seasonal factors. One of the major constraints in the maintenance of ducks is the fulfillment of their feed requirements. Various feed potentials can be utilized to tackle this problem. Pond pests (Gosse or Coontail; *Ceratophyllum demersum*) are one of the resources that can be utilized as a source of feed. If pond pests are used as feed, it will optimize pond production because the pests have been cleaned [1].

The negative impact of pond pests is pollution, especially a very pungent odor. Air pollution caused by pond pests can interfere with public health. Piles of pests with aquatic plants such as gosse will cause the environment to be polluted. The environment can be kept away from pollution caused by pond pests through the introduction of pond pest processing technology into animal feed [2].

Pond pest processing technology (pond waste based on previous research) has the potential to be used in providing quality feed. The production of gosse is 4,978 tons/ha of dry matter (DM). The production is able to support the feed needs of 306 ducks. In addition to gosse, other pond pests that also have the potential to be used as duck feed are tilapia. Mujair fish in pond businesses in Pangkep Regency are classified as pests that are difficult to eradicate and if successfully eradicated, they will generally be piled up causing odor (air pollution). The potential of tilapia fish as feed for ducks is very high. Even when compared with gosse, the potential of tilapia fish is much higher [3]. The tilapia fish are able to support duck feed on a large scale. Its used is recommended not to be singular [2].

Pond pests as feed for ducks open up opportunities for breeders to carry out intensive maintenance. This is because the two pond pests mentioned earlier are only a small part of the existing potential. The pond waste that can be used by duck farmers as an alternative protein source in Pangkep Regency are rebon, drawer shrimp, gold snails, tilapia, kale, banana stems, banana leaves [2]. All of these potentials have been researched and can be used as duck feed to give rise to maximum products and intensive maintenance systems. However, there is no detailed information about the optimal proportion of pond pests in duck feed. This study aims to determine the difference in the performance of ducks in the early phase of laying eggs that get rations made from pond pests with different proportions and to determine the effect of pond pest-based rations on the performance of ducks in the early phase of laying eggs.

## 2. MATERIALS AND METHODS

### 2.1 Time and Location of Research

This research was carried out in 2020 at the Polytechnic of Agricultural Pangkep State,

Indonesia for 2 months, starting from September to October 2020.

## 2.2 Research Design and Procedure

The study used 45, 6-month-old laying ducks, 5 each for each experimental unit. This study used a complete randomized design (RAL) consisting of 3 treatments each with 3 replications. The following are the treatments:

P0 = Maintenance using commercial feed

P1 = P0 + Pond pests 5 %

P2 = P0 + Pond pests 10 %.

The performance parameters observed in this study were ration consumption, egg production and egg weight.

## 2.3 Data Analysis

The mathematical model that describes each observation value is as follows:

$$Y_{ij} = \mu + \tau_i + e_{ij}$$

For  $i = 1, 2, 3$ , and  $j = 1, 2, 3$ ,

### Information:

$Y_{ij}$  = observation value in  $i$ -th treatment,  $j$ -th repeat

$\mu$  = common middle value

$\tau_i$  = effect of  $i$ -th treatment

$e_{ij}$  = error in the  $i$ -th treatment and  $j$ -th repetition

The statistical hypothesis of the study is as follows:

H0 :  $\tau_1 = \tau_2 = \tau_3 = 0$ , there is no difference in performance in ducks in the early phase of egg-laying with the addition of gosse to the ration.

H1 : there is at least one  $\tau_1 \neq 0$ , there is a difference in performance in ducks in the early phase of laying eggs with the addition of gosse to the ration.

To determine the effect of treatment on the measured variables, the data obtained were tested with fingerprints (ANOVA) with the help of SPSS Ver. 16.0 software. If the treatment shows a real effect, then proceed with multiple region tests (Duncan) to determine the difference between treatments [4].

## 3. RESULTS AND DISCUSSION

The feeding of pond pests in the duck ration in the early phase of egg-laying has a significant effect ( $P < 0.05$ ) on feed consumption based on statistical tests. Egg production and average egg

weight did not differ markedly ( $P > 0.05$ ) based on analysis of the variety between pond pest rations and conventional rations (Table 1).

Feed consumption in P0 treatment was markedly lower compared to P2 treatment. Feed consumption in P1 treatment was the same as P0 treatment. This indicates that the P0 treatment consumed less feed compared to other treatments although it was not statistically significant. Feed consumption in this study was in the range of 206.20-246.87 g/head/day. Feed consumption in this study was higher than that reported by Muhammad et al. [5] which states that ration consumption in local Sumatran ducks is 146.63-192.89 g/head/day. The high consumption of rations obtained shows that the treated feed given has a high level of preference for ducks in accordance with the opinion of Pond et al. [6] that consumption is strongly influenced by feed palatability. That feed palatability is the attractiveness of feed or feed ingredients that can cause appetite in livestock [6]. Duckweed and bladderwort contained the greatest number of invertebrate food organisms. The distribution of broods of ducklings is roughly correlated with the abundance of the invertebrates that apparently comprise the main food of many species of ducklings in their first week after hatching [7]. The importance of feed safety, traceability, and use of good feed manufacturing practices is stressed, together with the importance of considering the long term sustainability of feed ingredient supplies and the need to maximize the use of locally available feed ingredient sources whenever economically possible [8].

The percentage of egg production is not affected by the treatment of adding gosse to the ration of ducks in the early phase of egg-laying. This shows that the substitution of commercial feed with gosse has no effect on egg production. This shows that the use of gosse can reduce duck farmers' dependence on commercial feed. The percentage of egg production was not affected by differences in treatment which indicates that gosse feed can be an alternative feed at a low price. Gosse is a pond pest that is difficult to eradicate and tends to harm farmers because it will reduce production. The negative impact of pond pests is pollution, especially a very pungent odor. Air pollution caused by pond pests can interfere with public health. Piles of pests with aquatic plants such as gosse will cause the environment to be polluted. The environment can

**Table 1. Performance of early egg-laying phase ducks receiving pond pest rations**

Parameters	Treatment		
	P0	P1	P2
Feed Consumption (g/head/day)	206.20±13.50 <sup>a</sup>	234.31±24.27 <sup>ab</sup>	246.87±19.29 <sup>b</sup>
Egg Production (%)	26.25±8.72 <sup>a</sup>	29.17±7.64 <sup>a</sup>	23.33±5.77 <sup>a</sup>
Average Egg Weight (g/grain)	63.00±4.00 <sup>a</sup>	68.33±4.04 <sup>a</sup>	63.67±3.21 <sup>a</sup>

<sup>a,b</sup>Superscripts with different alphabets on the same row vary significantly ( $P < 0.05$ )  
P0 = Commercial feed; P1 = P0 + Pond pests 5 %; P2 = P0 + Pond pests 10 %

prevented from pollution caused by pond pests through the introduction of pond pest processing technology into animal feed [2]. Diet quality and wetland habitat conditions may affect waterfowl body condition, and survival [9,10].

Gosse and tilapia (fish that are not desirable to exist) are two of the many pests that often disturb farmers. Its existence greatly interferes with the productivity of milkfish ponds and shrimp farming. Eradicating these various wastes, is time consuming. Pest extermination using chemicals can also pollute water and other environments. The habit of using chemicals will have a negative impact on the health of farmers [2].

The utilization of gosse as an alternative feed will integrate animal husbandry and fisheries. This integration will solve the problem of shortage of duck feed as well as the problem of pond pests that can reduce production. The production of gosse is 4,978 tons / ha of dry matter (DM). The production is able to support the feed needs of 306 ducks [3]. The probability of a wetland being used by ducks and cumulative duck use of wetlands were significantly and positively affected by food energy density. However, ducks did not use wetlands in direct proportion to food energy density, which contradicted predictions of daily ration models (DRM) and IFD theory [11].

The average egg weight in this study was not influenced by the addition of gosse in the treatment ration. Egg weights in this study ranged from 63.00-68.33 g. The weight of eggs in this study was smaller than that reported by Muhammad et al. [5] who had reported that the weight of local eggs in South Sumatra ranged from 72,700 -78.35 g. However, the weight of eggs in this study was higher than the research conducted by Nugraha et al. [12] that the weight of tegal duck eggs ranged from 53.58-56.72 g. The ducks used in this study were in the early phase of egg-laying. In addition, differences in egg weight may be influenced by differences in age and breed of ducks used as research

objects. The weight egg is influenced by many factors, namely genetics, maturity stage, age and feed [13]. The weight of the egg reflects the size of the egg which will directly affect the quality of the egg. The egg weight is strongly influenced by egg size. The larger the egg, the heavier the weight of the egg [5].

#### 4. CONCLUSION

The conclusion of this study is that there is no real difference in duck egg production performance at the beginning of the egg-laying period with pond pests, therefore pond pests can be an alternative feed to suppress the use of commercial feed.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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