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Feeding And Vitamin Strategies For Optimal Duck Production

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ABSTRACT

Duck farming is a promising agribusiness because the market for duck meat and eggs stays fairly stable. Even so, how well this business performs depends largely on the farmer's feed management. This article looks at what an ideal feeding pattern for ducks looks like: feeding twice a day, in the morning and evening, using a mix of corn, rice bran, and pellet feed, along with extra vitamins to support growth and productivity. The discussion draws on a review of scientific journals, books, and extension reports. The review points to consistent feeding schedules, balanced feed composition, and vitamin or probiotic supplementation as factors that noticeably raise body weight, egg production, and disease resistance in ducks. When feed management is done well, duck farming can bring better and more profitable results for farmers.

Keywords: Duck Farming; Feed Management; Pellet Feed; Rice Bran; Vitamins.

INTRODUCTION

Duck farming is one of the poultry subsectors with considerable potential to support food security while increasing community income, particularly in rural areas. Compared with other types of poultry, ducks have a high ability to adapt to various environmental conditions and are relatively easy to raise by utilizing locally available resources. In addition to producing meat with a distinctive taste and high protein content, ducks also produce eggs that serve as raw materials for various processed food products. The high public demand for duck meat and eggs has encouraged duck farming to continue developing as a promising agribusiness opportunity (Direktorat Jenderal Peternakan dan Kesehatan Hewan [Ditjen PKH], 2022). In recent years, public consumption of poultry products has continued to increase along with population growth, greater public awareness of the importance of meeting animal protein needs, and the expansion of culinary businesses featuring duck meat. Various dishes, such as fried duck, grilled duck, seasoned braised duck, and ready-to-eat processed products, are increasingly available in many regions. This situation provides significant opportunities for farmers to increase their production capacity while developing product innovations with higher added value. Nevertheless, the increase in market demand must be accompanied by appropriate farming practices to ensure that both the quality and quantity of production are maintained (Prasetyo et al., 2010).

Although duck farming offers considerable economic opportunities, its success is strongly influenced by the implementation of appropriate husbandry management. One of the most decisive factors is feed management. Feed constitutes the largest component of duck production costs, accounting for approximately 60–70% of total operational expenses. Therefore, errors in ration formulation, feeding schedules, or the quality of feed ingredients can directly affect duck growth, feed utilization efficiency (*feed conversion ratio*), animal health, and ultimately the profits earned by farmers (Wang et al., 2020). Feed provided to ducks must meet their requirements for energy, protein, fat,

vitamins, minerals, and fiber according to their age and growth stage. During the starter phase, protein requirements are relatively higher to support the formation and development of body tissues, whereas during the grower and finisher phases, nutrient composition is more focused on increasing body weight and improving feed utilization efficiency. If these nutritional requirements are not optimally fulfilled, growth may be inhibited, immune resistance may decline, and productivity may not reach its maximum potential (Sidadolog et al., 2019; Fouad et al., 2018).

In addition to feed quality, feeding schedules are another important factor that is often overlooked by farmers. Providing feed regularly at the same time each day helps establish a stable feeding pattern, allowing the ducks' metabolism to function more optimally. A consistent feeding schedule also makes it easier for farmers to monitor the animals' appetite as an indicator of their health. In contrast, irregular feeding can cause stress, increase competition among the ducks, and lead to reduced productivity (Lingga et al., 2023). In addition to the main feed, the provision of vitamins and supplements is also an important component of duck husbandry management. Vitamins help support metabolic processes, strengthen the immune system, promote growth, and improve meat quality and egg production. In modern farming practices, vitamins are often combined with probiotics or organic minerals to maintain the balance of intestinal microflora and improve nutrient absorption efficiency. A study by Liu et al. (2025) demonstrated that organic mineral supplementation in duck feed can improve meat quality, enhance antioxidant capacity, and promote better growth performance.

At the smallholder farmer level, the implementation of proper feed management still faces various challenges. Most farmers continue to rely on knowledge and practices passed down through generations when determining feed types, ration composition, and the dosage of vitamins provided to their livestock. As a result, the feed provided often does not optimally meet the nutritional requirements of ducks. In addition, limited access to information on feed formulation, high feed ingredient prices, and insufficient technical assistance remain challenges to improving the productivity of duck farming enterprises. Therefore, easily understandable information regarding feeding and vitamin supplementation strategies that are appropriate to the nutritional requirements of ducks needs to be widely disseminated so that it can be applied by small- and medium-scale farmers. This article was prepared using a literature review approach with the aim of providing an overview of effective feeding and vitamin supplementation strategies to improve duck productivity. The discussion focuses on feeding schedules, the types and composition of feed ingredients, the functions of vitamins and probiotics, and other supporting factors that influence the success of duck farming. Through this article, farmers are expected to obtain scientific information that can serve as a reference for managing their farming enterprises more efficiently, thereby increasing livestock productivity and enabling farm income to grow sustainably.

COMMUNITY-SERVICE METHODS

Partners, Setting, and Period

In addition to the literature review, this article was supported by field observations conducted during the Community Service Program (Kuliah Kerja Nyata or KKN) of Universitas Dehasen Bengkulu in Dusun III, Taba Pasmah Village, Talang Empat District, Central Bengkulu Regency. The observations focused on feeding systems, vitamin use, and husbandry management practices implemented by local farmers. The field observation data were used as supporting information to connect theoretical findings with actual conditions in the field, making the discussion more applicable and relevant (Direktorat Jenderal Peternakan dan Kesehatan Hewan, 2022).

Implementation and shared roles.

This article employed a literature review method with a descriptive qualitative approach. The method aimed to examine various scientific references related to feeding and vitamin supplementation strategies in duck farming in order to obtain an overview of effective feed management for improving duck productivity. According to Sugiyono (2022), a literature review is a method conducted by collecting and analysing various relevant scientific sources to obtain a comprehensive understanding of a particular issue.

Data were obtained from various sources, including national and international scientific journals, livestock farming books, research reports, and official documents from the Ministry of Agriculture of the Republic of Indonesia. The literature search was conducted through Google Scholar, DOAJ, Garuda, and ScienceDirect using the keywords manajemen pakan bebek, duck feed management, duck nutrition, and

vitamin supplementation in ducks. The literature used consisted of publications from 1991–2025, with priority given to sources that were relevant, credible, and appropriate to the research topic (Creswell & Creswell, 2018).

Evaluation and participant protection.

The data were analysed using content analysis through the identification, classification, and synthesis of information based on four main themes: feeding schedules, types and composition of feed, vitamin supplementation, and factors affecting duck productivity. The results of the analysis were then presented descriptively to provide an overview of optimal feeding strategies. The descriptive approach was selected because it enables phenomena to be explained systematically and objectively based on the findings of various sources (Sugiyono, 2022).

RESULTS AND DISCUSSION

Why Is Feed Management a Key to Success?

The success of duck farming is determined not only by the quality of the breeding stock used but also by the implementation of proper husbandry management, particularly in terms of feeding. Feed is the primary requirement of livestock and, at the same time, the largest component of production costs in duck farming. Various studies have shown that feed costs can account for 60–70% of total operational costs. Therefore, efficiency in ration formulation and feeding practices directly affects the profits earned by farmers (Direktorat Jenderal Peternakan dan Kesehatan Hewan, 2023). During the implementation of the Community Service Program (Kuliah Kerja Nyata or KKN) in Dusun III, Taba Pasmah Village, students observed the husbandry systems implemented by local farmers. The observations showed that most farmers provided feed regularly every day; however, feed composition was still determined based on experience and the availability of materials in the surrounding area. Consequently, the nutritional content of the feed did not always meet the requirements of ducks according to their growth stages. Therefore, the students provided assistance regarding the importance of formulating balanced feed to improve livestock productivity.

Feed containing balanced nutrients can meet the requirements for energy, protein, fat, vitamins, and minerals, thereby supporting body tissue growth, strengthening the immune system, and improving feed utilization efficiency. Conversely, a deficiency in any essential nutrient can inhibit growth, reduce disease resistance, and decrease livestock productivity. According to Sidadolog et al. (2019), a balanced nutrient composition in the ration is a major factor determining both growth performance and egg production in ducks. In addition to feed quality, feeding time also plays a very important role. Regular feeding helps establish a stable consumption pattern, allowing the ducks' metabolism to function more optimally. A consistent feeding schedule can also reduce stress because the ducks become accustomed to being fed at the same time each day. This condition has a positive effect on feed intake, body weight gain, and egg productivity in laying ducks (Lingga et al., 2023).

The KKN students also educated farmers about the importance of providing clean drinking water that is available at all times. Water is an essential component of metabolic processes, helps support digestion, regulates body temperature, and facilitates nutrient absorption. An adequate supply of drinking water supports the optimal utilization of nutrients from feed, thereby helping to maintain the health and productivity of the ducks (Ditjen PKH, 2022).

Feeding Schedule: Morning and Afternoon Discipline

One of the basic principles of duck husbandry management is to provide feed regularly at the same time every day. Based on field observations, most farmers in Dusun III, Taba Pasmah Village, have implemented a twice-daily feeding schedule, in the morning and afternoon. This practice is consistent with the findings of Lingga et al. (2023), who stated that an effective feeding schedule is approximately 06:30–07:30 a.m. in the morning and 03:30–04:00 p.m. in the afternoon. Maintaining a disciplined feeding schedule provides several important benefits. First, a regular schedule helps establish consistent feeding habits, resulting in more stable feed consumption. Second, the ducks' energy requirements can be met throughout the day, thereby supporting their activities, growth, and egg production. Third, a regular feeding schedule makes it easier for farmers to monitor the ducks' appetite. A decrease in feed consumption is often an early indicator of health problems, allowing appropriate measures to be taken more quickly.



Figure 1. Feeding the ducks

In addition, maintaining a consistent feeding schedule also helps reduce stress in ducks. Ducks are poultry that are relatively sensitive to changes in their environment and husbandry practices. Sudden changes in feeding times can lead to reduced feed consumption, which may ultimately result in decreased productivity. Therefore, farmers are advised to maintain consistent feeding times every day to keep the physiological condition of the ducks stable (Suharno, 2002).

During the mentoring activities, the students also emphasized the importance of providing clean drinking water together with feed. Drinking water should be replaced regularly to maintain hygiene and prevent contamination by disease-causing microorganisms. According to the Direktorat Jenderal Peternakan dan Kesehatan Hewan (2022), an adequate supply of drinking water can improve feed utilization efficiency while maintaining the health of the ducks' digestive system.

Understanding the Types of Duck Feed

Feed quality is one of the main factors determining the success of duck farming. Good-quality feed must be able to meet the ducks' requirements for energy, protein, fat, vitamins, minerals, and fiber according to their growth stage. During the KKN activities, the students provided assistance to farmers regarding the selection of feed ingredients that are easily available in the surrounding area while still providing adequate nutritional content. In smallholder duck farming, the most commonly used feed ingredients are ground corn, rice bran, and concentrate feed (pellet feed). These three ingredients are combined in specific proportions to produce a balanced ration. The use of local feed ingredients is also considered more economical, thereby reducing production costs without compromising the quality of livestock growth (Prasetyo et al., 2010).

Table 1. Types and Roles of Duck Feed

Type of Feed	Main Role	Description
Ground Corn	Main source of energy and carbohydrates	Supports daily activities and body weight gain in ducks
Rice Bran	Source of crude fiber and additional nutrients	Affordable, easily available, and commonly mixed with ground corn
Concentrate Feed (Pellet Feed)	Supplementary source of protein, vitamins, and minerals	Commercially manufactured feed with a complete and standardized nutritional formulation

1. Corn (Energy Source)
   Ground corn is the primary source of carbohydrates and energy in duck feed. Its high energy content supports daily activities and body weight gain. Corn is usually mixed with other feed ingredients to achieve a more balanced nutritional composition.
2. Rice Bran (Source of Fiber and Additional Nutrients)
   Rice bran serves as a source of crude fiber as well as additional nutrients. It is relatively affordable and readily available. A mixture of rice bran and ground corn is a common combination widely used

by smallholder farmers because it is economical while still supporting duck growth. The use of local feed ingredients such as rice bran is also consistent with findings showing that laying ducks can be fed diets based on local feed ingredients without reducing their production performance (Sidadolog et al., 2019).

3. Concentrate Feed (Commercially Manufactured Feed)
   Concentrate feed is commercially manufactured feed specifically formulated to meet the nutritional requirements of poultry more comprehensively, including protein, vitamins, and minerals. It is usually combined with corn and rice bran to help farmers reduce feed costs without compromising nutritional quality. The better the composition of these three feed ingredients, the more optimal the resulting growth and productivity of ducks. This is consistent with duck farming guidelines that emphasize the importance of combining corn, rice bran, and concentrate feed to meet the energy and protein requirements of waterfowl (Prasetyo et al., 2010).

The Importance of Vitamin Supplementation for Ducks

In addition to providing high-quality primary feed, vitamin supplementation is an important aspect of duck husbandry management. Vitamins are required in relatively small amounts, but they play a major role in supporting various physiological processes in the body. Vitamins contribute to strengthening the immune system, supporting metabolic processes, accelerating growth, improving meat and egg quality, and assisting reproductive processes in laying ducks. Therefore, appropriate vitamin supplementation is one of the measures that farmers can implement to improve the productivity of their farming operations (Ditjen PKH, 2022). During the Community Service Program (Kuliah Kerja Nyata or KKN) in Dusun III, Taba Pasmah Village, students observed the husbandry practices implemented by local farmers. The observations showed that some farmers had provided vitamins to their ducks; however, supplementation was still irregular and did not always follow the recommended dosage. Most farmers provided vitamins only when the ducks appeared weak or experienced a decrease in appetite. This condition indicates that farmers' understanding of the role of vitamins as a preventive measure against disease still needs to be improved.

Through the mentoring activities, students educated farmers about the importance of providing vitamins regularly as part of routine husbandry management rather than using them only as a treatment when ducks experience health problems. The students also explained the proper use of vitamins, either by mixing them into drinking water or feed according to the dosage recommended by the manufacturer or livestock officer. This assistance aimed to enable farmers to implement better livestock health management so that duck productivity could be maintained. Different types of vitamins have different functions. Vitamin A plays a role in maintaining eye health, supporting tissue growth, and strengthening the immune system. Vitamin D assists in the absorption of calcium and phosphorus and therefore plays an important role in bone formation and eggshell quality. Vitamin E functions as an antioxidant that protects body cells from damage caused by free radicals, while vitamin B complex supports energy metabolism and improves appetite. According to Wang et al. (2020), an appropriate balance of vitamins and minerals greatly influences growth performance, feed utilization efficiency, and poultry productivity.

In addition to synthetic vitamins, farmers were also introduced to the use of probiotics as nutritional supplements. Probiotics are living microorganisms that help maintain the balance of intestinal microflora, thereby optimizing nutrient absorption. The use of probiotics has been shown to improve feed utilization efficiency, enhance intestinal health, reduce the risk of pathogenic bacterial infections, and improve growth and egg production in ducks (An et al., 2022; Cao et al., 2022; Li et al., 2024). Lingga et al. (2023) explained that regular probiotic supplementation can improve production performance while maintaining livestock health without excessive reliance on antibiotics. A recent study conducted by Liu et al. (2025) also showed that supplementation with the organic mineral hydroxy methionine manganese in Cherry Valley ducks could improve meat quality, enhance antioxidant capacity, improve metabolism, and accelerate growth. These findings indicate that appropriate supplementation not only improves livestock productivity but can also produce higher-quality livestock products with greater economic value.

Through the extension activities conducted during the KKN programme, the community gained new knowledge regarding the importance of vitamins and probiotics as part of livestock husbandry management. Farmers began to understand that the costs associated with vitamin supplementation represent a long-term investment because supplementation can reduce the risk of disease, increase productivity, and reduce livestock mortality. Therefore, the implementation of proper livestock health management is expected to contribute to the sustainable success of duck farming enterprises.

Additional Tips for Optimizing Duck Farming

In addition to paying attention to feed quality and vitamin supplementation, the success of duck farming is also influenced by the implementation of proper overall husbandry management. During the mentoring activities, the students provided several recommendations to farmers to help continuously improve livestock productivity while maintaining cost efficiency. The mentoring activities were carried out through discussions, direct practice in the duck housing facilities, and the sharing of experiences with farmers regarding problems commonly encountered in duck farming. One important aspect is adjusting the amount and composition of feed according to the age of the ducks. During the starter phase, ducks require a higher protein content to support the growth of organs and body tissues. During the grower phase, energy requirements begin to increase to support body weight gain, while during the layer or egg-laying phase, additional calcium, phosphorus, and other minerals are required to support the formation of strong eggshells (Sidadolog et al., 2019).

Housing cleanliness is also an important factor in determining livestock health. Damp and dirty housing can become a breeding ground for bacteria, viruses, and parasites that may cause various diseases. Therefore, farmers are advised to clean the housing regularly, replace the bedding when it becomes wet, and ensure that feeding and drinking equipment is always kept clean. During the implementation of the KKN programme, the students and local community carried out a collaborative activity to clean the duck housing as a form of education on the importance of sanitation in the livestock farming environment.

Another equally important factor is controlling the temperature of the duck housing. Meat ducks grow optimally at a housing temperature of approximately 27–30°C with good air circulation. Excessively high temperatures can cause heat stress, while temperatures that are too low can increase energy requirements for maintaining body temperature. Therefore, farmers need to ensure proper ventilation and avoid excessive stocking density so that the ducks remain comfortable (Ditjen PKH, 2022). The students also educated farmers about the importance of maintaining records of husbandry activities. These records include the amount of feed provided each day, vitamin use, body weight gain, egg production, and livestock mortality. Through such records, farmers can evaluate feed utilization efficiency and the development of their farming enterprises. According to Soekartawi (2021), farm record-keeping is an important component of agribusiness management because it can assist farmers in making appropriate decisions to improve business profitability.

Overall, the mentoring results showed that proper feed management, appropriate vitamin supplementation, maintenance of housing cleanliness, and farm record-keeping are interconnected factors in improving duck farming productivity. By consistently implementing these principles, farmers can not only increase production but also reduce the risk of losses caused by disease and high operational costs. This approach represents an effective strategy for supporting the development of productive, efficient, and sustainable duck farming enterprises.

CONCLUSION AND RECOMMENDATIONS

Feed management is one of the main factors determining the success of duck farming. Feed provided regularly with a balanced nutritional composition can support growth, improve health, and achieve more optimal productivity. In addition, the implementation of a consistent feeding schedule, the provision of clean drinking water, and the use of vitamins and probiotics according to the ducks' needs have been shown to contribute to improved husbandry efficiency while reducing the risk of disease. Therefore, the implementation of proper feed management is an important step in increasing the profitability of duck farming. The results of the literature review, supported by field observations conducted during the Community Service Program (*Kuliah Kerja Nyata* or KKN) in Dusun III, Taba Pasmah Village, showed that most farmers had implemented regular feeding practices. However, further improvement in knowledge regarding balanced ration formulation, regular vitamin supplementation, and record-keeping of husbandry activities is still required. Through the mentoring activities conducted by the students, the community gained an understanding of the importance of combining corn, rice bran, and concentrate feed as the main sources of nutrients, as well as using vitamins and probiotics to maintain animal health and improve productivity.

In addition to nutritional aspects, the success of duck farming is also influenced by the implementation of comprehensive husbandry management, including maintaining housing cleanliness, regulating stocking density, providing clean drinking water, and regularly monitoring the health condition

of the ducks. The implementation of these principles can improve feed utilization efficiency, accelerate livestock growth, reduce mortality, and produce high-quality livestock products with greater competitiveness in the market. Overall, appropriate feeding and vitamin supplementation strategies not only contribute to increased livestock productivity but also support higher farmer income. Therefore, continuous collaboration among farmers, government agencies, universities, and livestock extension officers is required to provide mentoring, training, and the dissemination of farming technologies in accordance with scientific developments. With the implementation of proper feed management supported by innovations in husbandry practices, duck farming is expected to develop in a more productive, efficient, competitive, and sustainable manner, thereby contributing to improved community welfare and national food security.

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DECLARATIONS

1. **Statement on the Use of Artificial Intelligence:** Artificial intelligence tools were used to assist with English-language translation and linguistic refinement of the manuscript. The authors reviewed and verified the resulting text to ensure consistency with the original content and remain fully responsible for the accuracy, integrity, and final content of the manuscript.
2. **Author Contribution**
3. ASP: Conceptualization, Investigation, Writing, and Original draft; RD: Methodology, Investigation, Writing, and Original draft; IH: Investigation, Data curation, and Formal analysis; FA: Investigation, Formal analysis, Writing, and original draft; TJ: Data curation, Visualization, Writing, Review and Editing; K: Supervision, Validation, Writing, Review and Editing.
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