International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/

Vol. 58 No. 1 July 2026, pp. 84-89

Biological Evaluation Of Two Commercial Feeds In Sex-Separated Rearing System On KUB-2 Chicken Performance

Mohammad Hasil Tamzil[1], Budi Indarsih[1], Muhammad Aidil Fitriyan Fadjar Suryadi[1], I Gede Nano Septian, Nisa Atussholihah[2]

[1]Faculty of Animal Science, University of Mataram, Jalan Majapahit, number 62 Mataram Lombok, West Nusa Tenggara Indonesia

[2]Undergraduate students of Faculty of Animal Science, University of Mataram, Jalan Majapahit, number 62 Mataram Lombok, West Nusa Tenggara Indonesia.

Corresponding Author : Mohammad Hasil Tamzil, m.h.tamsil@unram.ac.id

Abstract: This study aimed to evaluate the biological performance of KUB-2 chickens reared under a sex-separated system and fed two different commercial diets. A 2 × 2 factorial randomized block design was employed using 120 one-day-old chicks consisting of 60 males and 60 females. The treatments were arranged based on sex and feed type, namely Charoen Pokphand and Malindo commercial feeds. Observed parameters included final body weight, weekly body weight gain, feed intake, feed conversion ratio (FCR), and mortality. Data were analyzed using Two-Way ANOVA. The results revealed that sex significantly affected all performance parameters ($p < 0.05$), with male chickens showing superior growth performance and feed efficiency compared to females. Feed type had no significant effect on the measured variables ($p > 0.05$). Furthermore, no significant interaction between sex and feed type was detected, indicating that the effect of sex on performance was consistent across both feed types. The best biological performance was observed in male chickens fed the Malindo diet, which also showed the lowest mortality rate. These findings highlight the importance of sex-separated rearing systems in improving the productivity of KUB-2 chickens and suggest that both commercial feed types can be used effectively in production systems.

Keywords: KUB-2 chicken, feed type, sex separation, performance, feed efficience

Introduction

Native chickens play an important role in supporting food security, household income, and rural livelihoods in Indonesia. In recent years, consumer demand for native chicken products has increased due to their distinctive taste, lower fat content, and perception as healthier poultry products. Nevertheless, the productivity of indigenous chickens remains relatively low compared with commercial broiler strains, particularly in terms of growth rate and feed efficiency. To overcome these limitations, the Indonesian Agency for Agricultural Research and Development developed Kampung Unggul Balitbangtan (KUB) chickens through selective breeding programs aimed at improving growth performance, egg production, and adaptability under tropical conditions (Sartika et al., 2016).

Among the improved native chicken strains, KUB-2 chickens have shown promising genetic potential for meat and egg production. However, management practices applied in smallholder farming systems are often still traditional and not fully adapted to the biological characteristics of the birds. One common practice is mixed-sex rearing, in which male and female chickens are raised together throughout the production period. This system may reduce production efficiency because male and female chickens exhibit different growth patterns, nutrient requirements, and metabolic rates (Mignon-Grasteau et al., 2015).

International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/
Vol. 58 No. 1 July 2026, pp. 84-89

Sexual dimorphism in poultry has been widely recognized as an important factor influencing growth performance and feed utilization. Male chickens generally demonstrate faster growth, greater muscle deposition, and better feed conversion efficiency than females due to differences in hormonal activity, protein metabolism, and genetic expression related to growth traits (Zuidhof et al., 2014). Female chickens, on the other hand, tend to reach physiological maturity earlier and deposit more body fat. These biological differences suggest that males and females require different management and nutritional strategies to achieve optimal productivity. Consequently, sex-separated rearing systems have been increasingly recommended in poultry production because they allow more precise feeding management, improved flock uniformity, and better economic efficiency (Shim et al., 2018).

In addition to sex differences, feed quality remains one of the most critical determinants of poultry productivity. Feed accounts for approximately 60–70% of total production costs in poultry farming; therefore, efficient feed utilization is essential for profitable production systems (Kpomasse et al., 2021). Commercial feeds produced by companies such as Charoen Pokphand (CP) and Malindo are commonly used by Indonesian poultry farmers because they provide standardized nutrient formulations designed to support rapid growth and efficient feed conversion. However, nutrient composition, ingredient quality, and digestibility may differ among commercial feed brands, potentially affecting chicken performance under different management systems (Abd El-Hack et al., 2022a).

Several previous studies have investigated the effects of sex and nutrition on broiler chickens, yet limited information is available regarding their combined effects on improved native chickens such as KUB-2. Most studies on KUB chickens have focused primarily on genetic improvement, growth performance, or feeding supplementation, while the interaction between sex-separated rearing and commercial feed type has received relatively little attention. Understanding these interactions is important for developing efficient and economically sustainable production systems for native chickens.

Therefore, this study aimed to evaluate the biological performance of KUB-2 chickens reared under a sex-separated system and fed two different commercial feed types. The findings of this study are expected to provide scientific information and practical recommendations regarding feeding and management strategies to improve the productivity and efficiency of KUB-2 chicken farming systems.

Materials and Methods

This study was conducted using a 2x2 factorial randomized block design involving 120 KUB-2 day old chicks (DOCs), equally divided into 60 males and 60 females. The chicks were randomly assigned into four treatment groups with three replicates each (10 birds per replicate): Male + CP, Male + Malindo, Female + CP, and Female + Malindo. All birds were reared in a semi-intensive system with standard environmental and health management practices for 8 weeks.

The feeds used in this study were CP BR1(Charoen Pokphand) and Malindo 8202. Both feeds are commercial starter rations containing balanced nutrients required for early-stage poultry development. Feed and water were provided ad libitum. Feed consumption was recorded weekly by subtracting leftover feed from the total feed given. Body weight was measured individually at the beginning and end of each week using a digital scale.

Performance parameters measured included:

1. Final Body Weight (g) – body mass at 8 weeks
2. Weekly Weight Gain (g/week) – calculated as the difference in body weight between consecutive weeks
3. Feed Intake (g/bird/week) – total feed consumed per bird per week
4. Feed Conversion Ratio (FCR) – total feed consumed divided by weight gain
5. Mortality Rate (%) – number of birds dead per treatment group divided by total birds, multiplied by 100

Statistical analysis was carried out using SPSS software. Two-Way ANOVA was used to analyze the effect of sex, feed type, and their interaction. Significance was declared at $p < 0.05$. Descriptive statistics were also computed to interpret trends.

International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/
Vol. 58 No. 1 July 2026, pp. 84-89

Results and Discussion

The present study evaluated the effects of sex and commercial feed type on the biological performance of second-generation Kampung Unggul Balitbangtan (KUB-2) chickens reared under a sex-separated management system. The observed parameters included final body weight, body weight gain (BWG), feed intake, feed conversion ratio (FCR), and mortality during the 8-week rearing period. Statistical analysis using Two-Way ANOVA showed that sex significantly affected all measured variables ($p < 0.05$), whereas feed type and the interaction between sex and feed type did not significantly influence production performance ($p > 0.05$).

Table 1. Effect of sex and feed type on the production performance of KUB-2 chickens (mean±SD)

Variable	Male A	Male B	Female A	Female B	Sex	Feed	Interaction
Body Weight (g)	1699.0±110.6	1744±230.3	1617.9±76.25	1554.8±79.35	0.02	0.74	0.40
BWG (g/week)	794±87.1	813± 28.2	728±75.1	683±34.4	0.02	0.72	0.40
FCR	2.31± 0.1	2.15± 0.1	2.69 ± 0.3	2.65 ± 0.3	0.01	0.46	0.65
Feed Intake (g)	1699.0±110.6	1744.1±230.3	1617.9±76.2	1554.8 ± 79.3	0.02	0.85	0.27
Mortality (%)	6.7 ± 11.5	0 ± 0	16.7 ± 5.77	13.3 ± 11.55	0.05	0.35	0.75
Note: BWG = body weight gain, A = Charoen Pokphand feed, B = Malindo feed							

The results indicated that male chickens consistently showed better biological performance than females regardless of feed type. Male chickens fed either Charoen Pokphand or Malindo feed exhibited higher body weight, greater BWG, lower FCR, and lower mortality rates compared with female chickens receiving the same diets. However, commercial feed type did not significantly affect any performance variable, indicating that both feed brands provided relatively similar nutritional adequacy for KUB-2 chickens. Likewise, the absence of a significant interaction between sex and feed type demonstrated that the effect of sex on performance remained consistent across the two commercial diets.

Sex significantly affected growth performance parameters of KUB-2 chickens. Male chickens exhibited significantly higher final body weight and BWG than females ($p < 0.05$). The highest body weight was observed in males fed the Malindo diet, while the lowest was found in females fed the same diet. Male chickens also showed lower FCR values, indicating more efficient feed utilization.

These findings are consistent with recent studies reporting that male native chickens generally have superior growth performance compared with females due to physiological and hormonal differences affecting muscle development and nutrient metabolism. Testosterone stimulates protein synthesis and muscle accretion, resulting in faster growth rates and better feed efficiency in males (Rajkumar et al., 2017). Similar observations were reported by Listyasari et al. (2022), who found that male KUB chickens demonstrated significantly greater body weight gain than females during the growing period.

In addition, sex-related growth differences are associated with differences in metabolic activity and nutrient partitioning. Male chickens allocate more nutrients toward lean tissue formation, whereas females tend to deposit more body fat at earlier ages (Zuidhof et al., 2014). This physiological mechanism explains the lower FCR observed in male chickens in the present study. Similar results have also been documented in modern native chicken production systems under tropical environments (Pham et al., 2022).

The growth curve demonstrated a consistently higher body weight trajectory in male chickens throughout the experimental period (Figure 1). Growth divergence between males and females became increasingly apparent after the fourth week, reflecting the onset of more intensive muscle deposition and accelerated growth in males.

International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/
Vol. 58 No. 1 July 2026, pp. 84-89

Commercial feed type did not significantly influence growth performance, feed intake, or FCR of KUB-2 chickens ($p > 0.05$). Although male chickens receiving the Malindo diet tended to show slightly higher body weight and improved FCR, the differences were not statistically significant. This result suggests that both Charoen Pokphand and Malindo feeds contained relatively comparable nutrient compositions capable of supporting optimal growth of KUB-2 chickens.

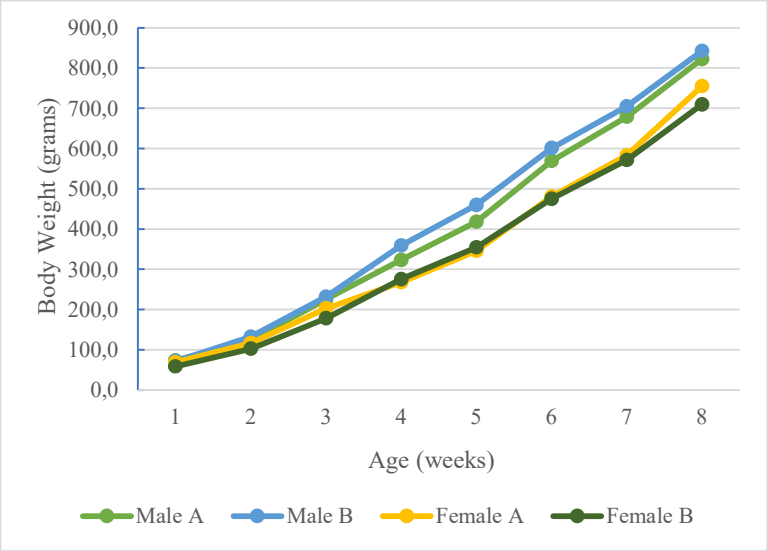

Figure 1. Growth Curve of KUB-2 Chickens During the 8-Week Rearing Period

The similarity in performance between feed brands may be attributed to the standardized nutrient formulation commonly applied in commercial poultry diets. Modern commercial feeds are generally formulated to meet the nutrient requirements for energy, protein, amino acids, vitamins, and minerals required for efficient poultry growth (Abd El-Hack et al., 2022b). Therefore, under proper management conditions, different commercial feed brands with similar nutrient specifications may produce comparable biological responses.

These findings are in agreement with recent studies showing that differences among commercial feed brands often produce limited effects on growth performance when nutrient levels are relatively equivalent (Sugiharto et al., 2021). Consequently, farmers may select commercial feed based on market availability, price, or accessibility without significantly affecting KUB-2 productivity.

The interaction between sex and feed type was not statistically significant for all observed parameters ($p > 0.05$). This indicates that the superiority of male chickens in growth performance and feed efficiency was maintained regardless of the commercial feed type used.

The absence of interaction suggests that genetic and physiological factors associated with sex exert a stronger influence on KUB-2 performance than variations between commercial feed brands. Similar findings have been reported in native and slow-growing chickens, where sex effects remained consistent across different feeding programs (Sogunle et al., 2020). This finding is practically beneficial because it simplifies feed management decisions for poultry farmers while emphasizing the importance of sex-separated rearing strategies.

Male chickens exhibited higher feed intake compared with females, reflecting their greater nutrient requirements for rapid growth and muscle development. Higher feed consumption in males is commonly associated with increased metabolic activity and larger body size (Rajkumar et al., 2017).

Mortality rates varied among treatment groups, with the lowest mortality observed in males fed the Malindo diet (0%) and the highest mortality occurring in females fed Charoen Pokphand feed (16.67%). Although statistically non-significant, these

differences may indicate variations in stress tolerance, immune response, and adaptability among treatment groups. Previous studies have shown that male native chickens may possess greater adaptability to environmental stressors under intensive rearing conditions (Pham et al., 2022).

Low mortality across treatments also indicates that both commercial feeds were capable of maintaining acceptable health and survivability throughout the rearing period. Good feed quality combined with proper management likely contributed to maintaining flock health and minimizing production losses.

The findings of this study have important practical implications for native chicken farming systems. Implementing sex-separated rearing can improve production efficiency through better feed utilization and more uniform growth performance. Since male chickens showed superior biological responses, they may be prioritized for meat-oriented production systems to maximize economic returns.

Furthermore, the absence of significant differences between commercial feed brands provides flexibility for farmers in selecting feed according to price and availability without compromising production performance. This flexibility is particularly important for smallholder poultry farmers who often face fluctuating feed prices and limited feed access.

Overall, the present study demonstrates that sex-separated management is an effective strategy for improving the productivity and efficiency of KUB-2 chicken production systems under tropical conditions.

Conclusion

The present study demonstrated that sex-separated rearing significantly affected the biological performance of KUB-2 chickens. Male chickens exhibited superior growth performance, higher body weight gain, better feed conversion efficiency, and lower mortality rates compared with female chickens throughout the rearing period. In contrast, the use of different commercial feed types, namely Charoen Pokphand and Malindo, did not significantly influence the observed performance parameters, indicating that both feed brands were nutritionally adequate for supporting the growth of KUB-2 chickens under intensive rearing conditions.

Furthermore, the absence of a significant interaction between sex and feed type suggests that the biological advantages of male chickens were consistent regardless of the commercial feed used. These findings emphasize that sex is a more influential factor than feed brand in determining the productivity of KUB-2 chickens.

From a practical perspective, the implementation of sex-separated rearing systems can improve production efficiency and optimize feed utilization in native chicken farming. Male KUB-2 chickens, in particular, show strong potential for meat-oriented production systems due to their superior biological responses and growth characteristics. Therefore, poultry producers are encouraged to adopt sex-based management strategies to enhance productivity, improve flock uniformity, and increase economic returns in KUB-2 chicken production systems.

References

[1]. Abd El-Hack ME, El-Saadony MT, Shafi ME, Qattan SYA, Batiha GE, Khafaga AF, Abdel-Moneim AME, Alagawany M. Probiotics in poultry feed: A comprehensive review. Journal of Animal Physiology and Animal Nutrition. 2022a Jan;106(1):183-199.

[2]. Abd El-Hack ME, El-Saadony MT, Shafi ME, Qattan SYA, Batiha GE, Khafaga AF, Abdel-Moneim AME, Alagawany M. Poultry nutrition and feed efficiency: Current advances and future perspectives. Animals. 2022b Feb;12(3):350.

[3]. Kpomasse CC, Tona K, Youssao AKI. Broiler production challenges and feed efficiency optimization: A review. Animals. 2021 Mar;11(3):892.

[4]. Mignon-Grasteau S, Narcy A, Rideau N, Chantry-Darmon C, Boscher MY, Sellier N, Chabault M, Konsak-Ilievski B, Gabriel I, Le Bihan-Duval E. Impact of selection for digestive efficiency on poultry performance and physiology. World's Poultry Science Journal. 2015 Dec;71(4):663-678.

[5]. Sartika T, Iskandar S, Tiesnamurti B. Genetic improvement of Kampung chickens through the development of KUB chickens in Indonesia. Indonesian Bulletin of Animal and Veterinary Sciences. 2016 Mar;26(1):1-10.

[6]. Shim MY, Song E, Billard L, Aggrey SE, Pesti GM, Sodsee P. Effects of sex and feeding strategies on growth performance and carcass characteristics in chickens. Poultry Science. 2018 Apr;97(4):1235-1245.

[7]. Zuidhof MJ, Schneider BL, Carney VL, Korver DR, Robinson FE. Growth, efficiency, and yield of commercial broilers from 1957 to 2013. Poultry Science. 2014 Dec;93(12):2970-2982.

[8].. Listyasari D, Ismoyowati, Mugiyono S. Growth performance and carcass characteristics of male and female KUB chickens. Biodiversitas. 2022 May;23(5):2487-2493.

[9]. Pham TN, Nguyen HT, Bui AA. Sex differences in growth performance and feed efficiency of slow-growing chickens under tropical conditions. Veterinary World. 2022 Apr;15(4):1021-1028.

[10]. Rajkumar U, Haunshi S, Paswan C, Padhi MK, Niranjan M, Chatterjee RN. Comparative evaluation of growth performance in improved indigenous chicken varieties. Indian Journal of Animal Sciences. 2017 Nov;87(11):1408-1413.

[11]. Sogunle OM, Adeleye OO, Bello KO, Fanimo AO. Influence of sex and feeding regime on growth performance of indigenous chickens. Tropical Animal Health and Production. 2020 Dec;52(6):3207-3214.

[12]. Sugiharto S, Yudiarti T, Isroli, Widiastuti E, Wahyuni HI. Effect of commercial feed types on growth performance and intestinal health of native chickens. Veterinary World. 2021 Jun;14(6):1578-1585.