



## Analysis of the Cost Efficiency of Using Feed with Different Types of Feed and Ducks

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**Abstract.** This study examined how cost-effective it was to raise three distinct kinds of ducks using three different types of feed. The results of this study should help researchers and the general public, particularly breeders, by supplying information on the kinds of feed and duck varieties that are more cost-effective in duck farming. Three distinct types of feed and three distinct breeds of ducks were used in this investigation. The study used an experimental design with a factorial pattern (3 x 3) and a completely randomized design (CRD), with three replications made up of two components with the codes factor A and factor B. A1 (feed BR1), A2 (feed PP3), and A3 (feed mix) make up factor A, which is the type of feed. Duck types comprise factor B, which includes B1 (Peking duck), B2 (Mojosari duck), and B3 (MA duck). The factors that were observed were feed cost per gain (FCG), economic efficiency of ration usage (EEPP), and efficient use of rations (FE). The acquired data were subjected to variance analysis (ANOVA), and the Duncan multiple range test (DMRT) was used to determine how the treatments differed. The study indicated that variables A and B did not interact in treatments. Regarding the cost-effectiveness of using feed, factor A had a highly significant effect ( $P > 0.01$ ). However, factor B had no discernible impact. This study concludes that the PP3 type of ration, which uses the more efficient Peking duck, has the best cost-efficiency when using rations. Based on the study findings, the recommendation is to employ Peking ducks fed PP3 diets to raise broiler ducks to their maximum body weight while minimizing ration expenses..

**Keywords:** Cost Efficiency, Duck, Ration

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### INTRODUCTION

In Indonesia, farmers grow ducks, among other fowl, as a source of revenue. Duck farming offers a plethora of business prospects as a substitute livestock enterprise. There is much room for profit in this venture. Strong maintenance management, in addition to good production management, is also necessary to ensure that the products are of high quality and have an effective marketing strategy. This is demonstrated by the several Indonesian regions that could serve as sites for the expansion of duck farming (Gunawan, 2018).

The efficiency with which production factors are used to determine the amount of profit that farmers earn serves as a benchmark for the performance of the livestock company

(Budiraharjo, 2009). Duck production depends heavily on the supply of high-quality, sustainably produced feed; however, feed costs are high since these ingredients are typically imported. Expensive feed costs are not similar to the price at which livestock products—such as eggs and meat—are sold. As much as 70% of the overall cost of production in the duck-rearing industry is spent on feed (Purba & Sinurat, 2015).

Raising ducks has a 70% overall production cost, so the most significant expense is feed. Price swings are currently observed in commercial feed and are essential to duck-rearing operations. The rise in feed prices will impact public opinion since higher production costs equate to lower earnings from duck sales at stagnant market pricing. Since commercial feed is more efficient than the many kinds of feed sold on the market, it is vital to understand its cost-effectiveness.

Prices for different types of rations and ducks traded in South Kalimantan vary—for instance, the BR 1 ration produced by PT. Japfa Comfed is sold for Rp 8,500,-/kg, while the PP3 ration at PT. Wonokoyo Jaya Corporindo Surabaya is priced at Rp 6,800,-/kg. Local rations, such as shrimp flour, are sold for Rp 7,000,-/kg, and paya is sold in the market for Rp 5000,-/kg. Depending on the breed, each type of duck has a distinct selling price. For example, Mojosari and Peking ducks aged 0–3 days cost Rp 5000/head, whereas Mojosari Alabio (MA) ducks cost Rp 9,000/kg. It is unknown how valuable ration cost efficiency is compared to other duck species among the many rations utilized in South Kalimantan.

The concept of efficiency in duck farming revolves around the economic effectiveness of feed costs as input and output variables. The feed conversion rate, which indicates feed efficiency, is a key metric in this regard. It's a measure of how effectively ducks convert feed into body mass. Factors such as growth rate, metabolic energy in the feed, size or weight, environmental temperature, and livestock health all influence feed efficiency, thereby impacting the economic effectiveness of feed costs.

Based on the above discussion, it is expected that the three varieties of feed will play a significant role in offering a more notable value of cost efficiency in the use of feed in duck rearing. This, in turn, can lead to the development of more productive types of feed and ducks in the duck farming industry, thereby enhancing its economic viability.

**METHOD**

**Material**

- Experimental Livestock. This study used 3 types of ducks, namely Mojosari, Peking and Mojosari Alabio ducks as many as 135 heads aged 14 days, with details of 45 male Peking ducks, 45 male Mojosari ducks and 45 MA (Mojosari Alabio) males. The ducks are divided into 27 cage plots, in 1 plot containing 5 similar ducks.
- Experimental feed. Three types of feed were used in this study, namely BR 1 feed, PP3 feed, and Mix feed (PP3, swamp and shrimp flour).

**Table 1. Nutrient Content of Experimental Rations**

Feed	Food content						
	Price /kg (Rp)	Protein (%)	Fiber (%)	Fat (%)	Ca (%)	P (%)	EM (Kcal/kg)
BR1 <sup>1)</sup>	8.500,-	21,00	4,00	5,00	2,00	1,50	3.200
PP3 <sup>2)</sup>	6.800,-	20,00	7,00	7,00	3,50	1,00	2.700
Mix <sup>3)</sup>	6.200,-	23,05	13,67	5,01	3,40	0,78	2,328

<sup>1)</sup> Production PT . Japfa Comfed

<sup>2)</sup> PT. Wonokoyo Jaya Corporindo Surabaya

<sup>3)</sup> Feed Mix (PP3, Paya, Shrimp Meal)

**Table 2. Nutrient Content of Feed Mix**

(<sup>1)</sup>PT Wonokoyo Jaya Corporindo (2021), (<sup>2)</sup>Subhan dkk (2010), dan (<sup>3)</sup>Agustono dkk (2009))

No	Feed	Crude protein (%)	Crude Fat (%)	Crude Fiber (%)	Calcium (%)	Water content (%)	Ash (%)	Fosfor (%)	EM (kcal/kg)
1	PP3 <sup>1)</sup>	21,00	7,00	7,00	3,00	14,0	14,0	0,8	2.900
2	Paya <sup>2)</sup>	2,95	1,44	16,47	0,19	17,88	0,28	0,05	2.900
3	Shrimp Waste Flour <sup>3)</sup>	45,29	6,62	17,59	7,05	12,0	18,65	1,52	1.190
Sum		69,24	15,06	41,06	10,24	43,88	32,93	2,37	6.990
Average		23,06	5,01	13,67	3,41	14,62	10,97	0,79	2.327,67

**Tool**

The equipment used in this study was :

- Oxone brand digital scales with a capacity of 5 kg with an accuracy of 1 gram, used for weighing feed and ducks.

- The cage is made of materials such as boards, bamboo, tin roof with an area of 6 x 4 m. Inside the cage there are cage plots measuring 100 x 50 x 60 cm as many as 27 plots. The base of the cage is lined with rice husks. The drinking place used is gallon shaped and the feed holder used is rectangular made of wooden boards as many as 27 pieces.

A factorial complete randomized design is one in which multiple factors or treatments are observed about one or more responses, resulting in a factorial arrangement. A standard factor, called a factor level, should be used for every therapy. Factorial pattern (3x3) was utilized in the design since this study's two factors—factor I, or the first type of feed, and factor II, or the second type of duck—are separated into three categories: feed and duck. Feed code A, composed of three components, is a factor I. This feed is feed BR1. There are three types of feeds: mix feed (A3), PP3 wonokoyo feed (A2), and Comfeed (A1).

Three different forms of Peking ducks (code B1), Mojosari ducks (code B2), and Mojosari Alabio ducks (MA) (code B3) make up Factor II, a species of duck designated B. In an open environment (a cage), this study employs experimental techniques to examine the following treatment:

- A1B1 = Broiler ration (BR1) given to Peking ducks
- A2B1 = PP3 ration given to Peking ducks
- A3B1 = Mix ration given to Peking Ducks
- A1B2 = Broiler Ration (BR1) given to Mojosari ducks
- A2B2 = PP3 ration given to Mojosari ducks
- A3B2 = Mix ration given to Mojosari ducks
- A1B3= Broiler Ration (BR1) given to Mojosari Alabio ducks
- A2B3 = PP3 ration given to Mojosari Alabio ducks
- A3B3= Mix ration given to Mojosari Alabio ducks

This research was carried out at the Poultry Laboratory, Agricultural Teaching Farm which is located in Bentok Village, Bati-bati District, Tanah Laut Regency for 2 months, including: preparation, implementation of research, observation and processing of data results.

- Cage preparation  
Before the DOD is placed into the cage, the cage and equipment (feed bin and drinking water container) are cleaned first by washing using a high-pressure spray. Then

spraying is carried out on the cage and cage equipment (feed and drinking water) using a disinfectant solution.

- **Manufacture of treatment units**

Making 27 duck plots, each plot measuring 100 x 50 x 60 cm which has been equipped with feed and drinking stations.

- **Treatment at the time of placing ducklings into the pen**

Age ducklings begin treatment age 14 days. Ducklings are put on pre-prepared cage plots according to each treatment. The distribution of DOD is carried out in a random system using a lottery system so that each DOD gets the same opportunity in each treatment. Ducks are placed on cage plots filled with 5 heads each.

- **Maintenance**

Maintenance is carried out for 6 weeks. Feeding ducks is carried out 3 times a day, namely morning, afternoon and evening with each percentage of 50% and drinking water is given *ad libitum*.

- **Feed Consumption Measurement**

Every day the addition of feed / plot is recorded and once a week the remaining feed will be weighed.

- **Weight Weighing**

Weight weighing is carried out once a week starting at the time of placement of ducklings into each plot until the end of the maintenance period.

### **Variable Measurement**

Measurement variables of economic analysis of feed cost efficiency observed include: :

- a) According to Irfanto and Maker (2020), *ration conversion* is a comparison of the amount of feed consumption with weight gain in a certain period of time or with the following formula.

$$KR = \frac{JKM}{PBB}$$

Information :

KR = Ration consumption

PBB = Weight gain

JKM = Amount of feed consumption

Economic Efficiency of Feed Use (*EEPP*) according to Nasution (2011) that efficiency can be explained by understanding the comparison between input and output, then efficiency is the ratio between input and output with the following formula:

Information :

EEPP = Economic efficiency of feed use

Biaya Ransum = Number of rations consumed x price (Rp)

Nilai Jual = Selling price per head

b) Feed Cost Per Gain (FCG)

According to Irfanto and Maker (2020), Feed Cost Per Gain is obtained by calculating the amount of feed consumption during the study multiplied by the ration price using the formula:

$$FCG = \text{Biaya Ransum} / \text{PBB}$$

**Data Analysis**

Data from observations during the study were collected, then anova variety analysis was carried out to determine the difference in the effect of treatment on the observed variables. If the results of the variance analysis show a real or very real effect, the test is continued with the *Duncan Multiple Range Test (DMRT)*.

**DISCUSSION**

**Ration Conversion**

The average data from observations of research on the use of different types of feed and ducks on ration conversion are presented in Table 3.

**Table 3. Average feed conversion**

Types of rations	Types of Ducks			Average ± SEM
	Peking	Mojosari	MA	
BR1	2,75	3,02	3,41	<b>3,06 ± 0,19<sup>a</sup></b>
PP3	3,31	3,33	3,75	<b>3,46 ± 0,14<sup>b</sup></b>
Mix	5,44	5,37	5,45	<b>5,42 ± 0,03<sup>c</sup></b>
<b>Average ± SEM</b>	<b>3,83 ± 0,82</b>	<b>3,91 ± 0,73</b>	<b>4,20 ± 0,63</b>	

Description: Numbers followed by different *superscript* letters in the average column show a very noticeable difference

Based on the computation results, the DMRT test and variety analysis demonstrated that using various feed types significantly impacted feed conversion ( $P > 0.01$ ). No interaction was observed between the meal types and feed conversion in experiments with ducks. This study revealed that the ducks drinking BR1 feed had the lowest feed conversion, 3.06, followed by the ducks receiving PP3 feed, 3.46, and the ducks using the mixed feed, 5.42, had the highest feed conversion. At 3.06 kg of feed required to gain 1 kg of weight in a single duck, BR1 feed has the lowest feed conversion rate. This can be expressed because consuming less feed leads to less weight gain, so feed usage is more efficient when the feed conversion value is lower. Research backs up Wisuku's (2012) assertion that calculating the value of feed conversion is one approach to determining the economic worth of feed fed to cattle. The amount of feed required to gain one kilogram of weight is known as the feed conversion, and it is a tool for evaluating feed quality.

The feed conversion values for BR1 and PP3 rations are 3.06 and 3.46, respectively. Regarding feed use, these two feeds' conversion values are practical. Despite its 5.42 feed conversion value, mixed feed could be used more efficiently. This underpins Arifah's (2013) study, which indicates that feed conversion ranges from 2.04 to 4.22 for male ducks raised until severely chopped.

The data above indicates that feed consumption affects feed conversion. BR1 feed is consumed at the lowest rate due to the feed's type and content. Bovine nutrition requirements are satisfied by BR1 feed, which contains the following PT Japfa Comfeed Indonesia Tbk's table indicates that BR1 Comfeed feed meets the nutritional needs of ducks at the age of 0–6 weeks, specifically PK 20%, EM 2,600 kcal/Kg, Calcium 1%, and P available 0.50%. Crude protein content is 22%, crude fat is 5%, crude fiber is 4%, and calcium is 2% to get the most ideal body weight gain in cattle. The mixed feed has the highest FCR because the ration easily scatters when consumed by ducks. Its texture is coarse, which causes hunger. However, the BR1 feed is more accessible to consume and less likely to be scattered because its form is denser—more specifically, it takes the form of a crumble.

PT. Japfa Comfeed Indonesia, Tbk, a renowned producer, is at the forefront of manufacturing BR1 SP Crumble-type feeds, as noted by Puspita (2017). These feeds, suitable for animals of all ages, are a type of cattle ration that resembles a pellet but has been further processed to make it even smaller. The energy needs and ration energy content, as highlighted by Imawan (2016), significantly influence ration consumption. Meeting energy needs leads to smaller ration consumption, and vice versa.

Variety analysis computations indicate no discernible impact ( $P < 0.05$ ) from the treatment of duck species. The Peking ducks demonstrated the highest feed conversion rate at 3.83, followed by the Mojosari ducks at 3.91 and the Mojosari Alabio ducks at 4.20.

### Economic Efficiency of Feed Use

Data hasil pengamatan penelitian penggunaan jenis pakan dan itik yang berbeda terhadap efisiensi ekonomi penggunaan pakan di sajikan pada Tabel 4.

**Table 4. Economic Efficiency of Feed Use**

Types of rations	Types of Ducks			Average $\pm$ SEM
	Peking	Mojosari	MA	
PP3	0,75	0,76	0,86	<b>0,79<math>\pm</math> 0,03<sup>a</sup></b>
BR	0,78	0,86	0,97	<b>0,87<math>\pm</math> 0,05<sup>a</sup></b>
Mix	1,13	1,11	1,13	<b>1,12<math>\pm</math> 0,01<sup>b</sup></b>
<b>Average <math>\pm</math> SEM</b>	<b>0,89<math>\pm</math> 0,12</b>	<b>0,91<math>\pm</math> 0,11</b>	<b>0,98<math>\pm</math> 0,08</b>	

Description: Numbers followed by different *superscript* letters in the average column show a very noticeable difference

According to the Variety Analysis and DMRT Test results, ducks have no real influence ( $P < 0.05$ ) on the economic efficiency of feed use on feed types. However, their use has a very significant effect ( $P > 0.01$ ) on the treatment of utilizing different types of feed. A study examining the relationship between the economic efficiency of ration consumption and the types of feed used on ducks found no interaction.

With an efficiency value of 0.79, PP3 feed has the highest economic efficiency among feed types. Table 6 also displays the economic efficiency value for ducks. The Feed Use's Economic Efficiency Peking ducks have the highest average efficiency value (0.89) compared to other duck breeds.

Apart from PP3 feed's superior economic efficiency, Table 5's supporting data from the income calculation results calculation indicates that using PP3 feed with Peking duck varieties yields the highest income, surpassing BR1 feed. Using PP3 feed yielded the highest IOFC value (Table 6), and Tables 8 and 9's computation of B/C and R/C indicates that utilizing PP3 feed with Peking duck species is one viable business strategy.

**Table 5. Revenue earned for each treatment combination**

Perpetrators	Duck Weight (Kg)	Duck Price (Rp)	Total (Rp)
A1B1	21,31	30.000	639.300
A1B2	19,495	30.000	584.850
A1B3	14,225	28.000	398.300
A2B1	17,275	30.000	518.250
A2B2	17,045	30.000	511.350
A2B3	13,095	28.000	366.660
A3B1	18,235	30.000	547.050
A3B2	17,455	30.000	523.650
A3B3	14,215	28.000	398.020

**Table 6. IOFC (feed revenue–price) calculation**

Code	Total Revenue	Feed Price (Rp)	Result (Rp)
A1B1	639,300	392,360	246,940
A2B1	584,850	324,516	260,334
A3B1	398,300	297,466	100,834
A1B2	518,250	322,992	195,258
A2B2	511,350	321,008	190,342
A3B2	366,660	293,080	73,580
A1B3	547,050	423,045	124,005
A2B3	523,650	345,814	177,836
A3B3	398,020	331,641	66,379

**Table 7. Profit and Loss Analysis**

Treatment	Total Receipts (Rp)	Total Cost (Rp)	Amount of Profit and Loss (Rp)
A1B1	639.300	558.032	81.268
A1B2	584.850	490.189	94.661
A1B3	398.300	475.670	(77.370)
A2B1	518.250	488.664	29.586
A2B2	511.350	486.680	24.670
A2B3	366.660	458.752	(92.092)
A3B1	547.050	648.717	(101.667)
A3B2	523.650	571.486	(47.836)
A3B3	398.020	557.313	(159.293)

**Table 8. Value of B/C Ratio**

Treatment	Income (Rp)	Variable costs (Rp)	Value
A1B1	2.557.200	2.114.324	1,21
A1B2	2.339.400	1.842.950	1,27
A1B3	1.593.200	1.784.875	0,89
A2B1	2.073.000	1.836.850	1,13
A2B2	2.045.400	1.828.914	1,12
A2B3	1.466.640	1.717.202	0,85
A3B1	2.188.200	2.477.064	0,88
A3B2	2.094.600	2.168.140	0,97
A3B3	1.592.080	2.111.446	0,75
Average	1.994.413	1.986.863	1,00

**Table 9. R/C value**

Treatment	Income (Rp)	Total Cost (Rp)	Value
A1B1	2.557.200	2.352.130	1,09
A1B2	2.339.400	2.080.755	1,12
A1B3	1.593.200	2.022.681	0,79
A2B1	2.073.000	2.074.656	1,00
A2B2	2.045.400	2.066.720	0,99
A2B3	1.466.640	1.955.008	0,75
A3B1	2.188.200	2.714.870	0,81
A3B2	2.094.600	2.405.946	0,87
A3B3	1.592.080	2.349.252	0,68
Average	1.994.413	2.224.668	0,90

**Table 10. IRR value**

Treatment	NPV (Rp)	Value IRR (%)
A1B1	3.798.717	93%
A1B2	3.492.936	95%
A1B3	2.227.385	75%
A2B1	3.037.465	88%
A2B2	2.992.102	87%
A2B3	2.027.196	72%
A3B1	3.075.031	76%
A3B2	2.991.696	80%
A3B3	2.143.821	67%
Average	2.865.150	81%

With an average efficiency value of 0.79, which is significantly lower than 1, PP3 feed has the highest economic efficiency value among the three types of feed. This is in comparison to the BR1 feed, which has an efficiency value of 0.87. When in Mix feed, where 1.12 is more than 1. With a low feed cost resulting in weight growth that satisfies the selling price criteria, the PP3 feed's efficiency value 0.79 suggests. Because PP3 feed costs less than BR1 feed, ducks raised on it grow to their ideal body weight at the best rate.

According to Soekartawi (2003), a treatment is considered adequate if its economic efficiency is less than 1. The low feed prices associated with growing livestock result in more weight growth in the animals, and the usage of production components is inefficient if the feed's economic efficiency is more significant than 1. The animals have gained much weight despite the higher feed expenses. The PP3 feed not only boasts the highest nutritional content among the three types of feed—PK 21%, LK 7%, SK 7%, Calcium 3%, Phosphorus 0.8%, and EM 2,900 kcal / kg—but also has the lowest feed costs. This combination of high nutritional value and low cost further underscores the exceptional economic efficiency of the PP3 feed.

Sidadolog et al. (2019) mentioned that ducks need 20% PK, 2,600 kcal / kg EM, 1% calcium, and 0.50 percent P available for growth at ages 0–6 weeks. According to those above, when compared to BR1 and Mix feed, PP3 feed had the highest economic efficiency. This is because feed costs cheaper while producing the best possible weight increase. Ducks fed Mix feed had a relatively low weight gain, even if BR1 feed is more expensive. Compared to other feeds, the mixed feed has lower costs per kilogram, but because it is in powder form, it is harder for birds to eat, resulting in less digested feed overall. As a result, even though the birds require much feed, their weight is not ideal.

According to the Variety Analysis results, the application of various duck varieties had no discernible impact ( $P < 0.05$ ) on the economic efficiency of feed usage. Since the value of economic efficiency is essentially the same, the type of duck has little bearing on feed consumption. Mojosari-Alabio has an economic efficiency rating of 0.98, Peking ducks have an economic efficiency value of 0.89, and Mojosari ducks have an estimated economic efficiency value of 0.91. With an efficiency value of 0.89, the Peking duck breed has the highest economic efficiency. Broiler ducks, a particular variety of Peking duck, produce more meat than other duck varieties, contributing to their high weight gain, which is determined by their breed. According to Wakhid's (2010) research, Mojosari ducks may weigh 1.7 kg as adults, and Peking ducks might weigh roughly 3.25 kg at 35 days of life. Meanwhile, Mojosari-Alabio ducks weigh between 1.2 and 1.4 kg per head at six weeks of age (Racmatica & Siti, 2015).

### Feed Cost Per Gain

Data from observations of research on the use of different types of feed and ducks on Feed Cost Per Gain are presented in Table 11.

**Table 11. Feed Cost Per Gain (Unit Rp)**

Types of rations	Types of Ducks			Average $\pm$ SEM
	Peking	Mojosari	MA	
PP3	Rp. 22,529,-	Rp. 22,680,-	Rp. 25,447,-	23,562 $\pm$ 958 <sup>a</sup>
BR	Rp. 23,393,-	Rp. 25,687,-	Rp. 29,007,-	26,029 $\pm$ 1,630 <sup>a</sup>
Mix	Rp. 33,743,-	Rp. 33,260,-	Rp. 33,799,-	33,604 $\pm$ 171 <sup>c</sup>
Average $\pm$ SEM	26,555 $\pm$ 3,603	27,209 $\pm$ 3,148	29,428 $\pm$ 2,411	

Description: Numbers followed by different *superscript* letters in the average column show a very noticeable difference

Variability Analysis and Additional Tests supported DMRT's hypothesis that the type of feed used has a significant impact ( $P > 0.01$ ) on feed cost per gain when used in different combinations with different ducks. Regarding the cost of various feed kinds, PP3 feed has the lowest average cost per kilogram of body weight produced, at Rp 23,562. The results showed no significant difference ( $P < 0.05$ ) in the feed cost per gain for the duck type. No correlation was found between feed cost per gain and the usage of various folks during the research.

The type of feed significantly influences Feed Cost per Gain ( $P > 0.01$ ). Demonstrates that PP3 feeds have the lowest feed expenditures for every kilogram of weight growth. This is because rations with PP3 feed content, which satisfies duck requirements as listed in the PT feed table, are reasonably priced. According to Wonokoyo Jaya Corporindo, the PP3 ratio has 22,9% PK, 7% LK, 7% SK, 0.8% Phosphorus, and 2,900 EM (kcal/kg). Ducks require 20% crude protein, 2600 kcal/kg of energy, 1% calcium, and 0.50% phosphorus between 0 and 6 weeks (Sidadolog et al., 2019).

In order to obtain a low feed cost per gain, Basuki (2002) asserted that the feed materials used in feed composition must be as inexpensive as feasible and consistently available, or non-competitive agricultural waste may be used. Hence, if the value obtained is smaller, the feed cost per gain will be deemed suitable. Because PP3 feed has lower feed costs than Mix Feed and BR 1 feed costs, it can be concluded from the preceding explanation that PP3 feed is more economical when generating 1 kg of duck body weight. The more economical the feed type, the lower the feed cost from the selling price of the animals, and hence the higher the feed cost per gain.

According to the Variety Analysis results, the three types of ducks mentioned above have essentially the exact feed cost per gain value, indicating that the treatment of experiments with different ducks has no real influence ( $P < 0.05$ ) on feed cost per gain. With a value of Rp 26,555, the Peking duck has the lowest feed cost per gain of any duck variety in this study compared to other varieties. This means that one kilogram of body weight can be produced at the least expense. This indicates the low-cost body weight production that satisfies Peking Ducks' market standards.

## CONCLUSION

Utilizing PP3 feed in conjunction with Peking ducks—a more productive breed of duck—offers the optimum cost-efficiency. Studies using different types of feed and ducks observed no interaction between treatment and ration use efficiency (FE), demonstrating the lack of treatment interactions on feed cost per gain and the economic effectiveness of ration use.

Feed conversion, feed economic efficiency, and feed cost per gain indicate that the PP3 type of feed is the best option for broiler duck fattening businesses looking to maximize weight growth and minimize feed expenses. Compared to BR1 feed and feed mix, PP3 demonstrates cost-effectiveness while using feed.

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