Effect of Probiotics in Different Ration Proteins on Protein Consumption in 10-Week-Old Native Chicken

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Abstract. This study examines the effect of probiotics in different ration proteins on protein consumption in 10-week-old native chickens. The study involved 120 three-week-old native chickens, divided into 24 experimental units of five chickens each. Initially, chickens were fed commercial broiler concentrate for two weeks. Treatment feeds included rice bran, ground corn, soybean meal, protein meat meal, premix, and probiotics. The experimental design was a randomized complete factorial design (3 x 2) with probiotic levels (0 ml, 1.25 ml x 10^7 cfu/ml, 2.5 ml x 10^7 cfu/ml) and ration protein levels (starter 18%, finisher 16%, starter 16%, finisher 14%). This resulted in six treatments: L1P1, L2P1, L3P1, L1P2, L2P2, L3P2. Parameters measured were protein consumption, digestibility, N retention, and protein efficiency ratio. Data were analyzed for variance, and significant differences were further examined using Duncan's Multiple Range Test.

Keywords: Probiotics, Protein, Digestibility, Native

1 Introduction

Native chicken is a local chicken in Indonesia, known as free-range chicken (non-breed). Its potential should be developed because its development is very comprehensive, from villages to cities. In addition, the taste of the meat is more favoured by the public than other chicken breeds because it has a firmer texture. Community demand for native chicken meat is increasing yearly, so it is necessary to make efforts in development, one of which pays attention to maintenance management, feed and the environment.

Probiotics are feed additives in the form of live microorganisms that positively affect livestock that consume them. A balanced microflora will be the basis for using probiotics to suppress the development of pathogenic bacteria. A balanced microflora condition will have a stronger resistance, especially against the attack of intestinal pathogen bacteria.[1] Good feeding management is expected to allow livestock to utilize feed optimally to increase their growth and productivity. Good feed is expensive and, therefore, inefficient, while the more efficient the use of ration protein, the more economical it is. Therefore, it is necessary to research the provision of

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probiotics in drinking water, which is expected to increase the efficiency of the use of ration protein, which is expected to increase livestock productivity and be more economical.

2 Material and Methods

The study was conducted from October to December 2014, during which time the birds were reared for 12 weeks at the Poultry House, Faculty of Animal Husbandry and Agriculture, Diponegoro University, Semarang. There were 120 male and female (unsex) 3-week-old native chickens with an average body weight of 149.11 ± 20.06 grams (CV 13.45%). The feed ingredients and nutritional content for the ration consisted of corn, rice bran, soybean meal, protein meat meal, premix and probiotics, as presented in Table 2. The research ration consisted of two types of rations, P1 (18% and 16%) and P2 (16% and 14%), for all periods with an EM of 2900 kcal/kg. The composition and nutrient content of the research rations for starter and finisher periods can be seen in Table 1.

Table 1. Nutrient Content of Ration Ingredients

Nutrient Content	component of feed ingredients					
	Corn	Rice bran	Soybean cake	Protein Meat Meal	CaCO3	Premix
EM (kkal/kg)	3145,10	2853,99	2935,36	2735,80	-	-
PK (%)	7,87	9,93	43,70	51,49	-	-
SK (%)	3,38	14,02	7,92	5,37	-	-
Ca (%)	0,32	0,00	0,53	4,16	26,63	0,06
P (%)	0,38	0,58	0,22	1,46	0,02	-

Description:
EM calculated using Balton's formula

This study used a complete randomized design (CRD) factorial pattern (3 x 2) repeated four times. The first factor, the starter phase, was given feed protein P1 (18% and 16%) with probiotic levels (0 ml), 1.25 ml x 107 cfu/ml, and 2.5 ml x 107 cfu/ml). While the second factor, the finisher phase, was fed protein P2 (16% and 14%) with probiotic levels (0 ml), 1.25 ml x 107 cfu/ml, and 2.5 ml x 107 cfu/ml).

Table 2. Combination Treatment of Probiotic Level and Ration Protein

Treatment (Probiotic Level)	Ration Protein Treatment	
	P1 (18% dan 16%)	P2 (16% dan 14%)
L1 (0 ml)	L1P1	L1P2
L2 (1,25 ml x 10^7 cfu/ml)	L2P1	L2P2
L3 (2,5 ml x 10^7 cfu/ml)	L3P1	L3P2

Research Parameters. The observed parameters and data collection procedures are as follows:

1) Protein Consumption = Ration consumption (g) x Ration protein (%).
2) Protein Digestibility (PD)= the amount of protein consumed for 48 hours, the total period of excreta collection minus the protein that comes out through the feces.

$$= \frac{\text{Consumption of PD} - (\text{excreta PD} - \text{endogenous PD})}{\text{Consumption of PD}} \times 100\%$$

3) N Retention = Taking a sample of 1 chicken per treatment unit and satisfying it for 24 hours. Total excreta collection was done for three consecutive days. Total collection was done at week 10.

The data obtained were analyzed using variance analysis, and if there was a significant treatment effect, Duncan's Multiple Range Test was used to determine treatment differences.

3 Result and Discussion

3.1 Consumption of Protein

Based on the study's results, there was no interaction between the provision of probiotics and the ratio of protein, which was significantly different (P>0.05) in protein consumption. However, there was a significant effect (P<0.05) of different ration proteins on protein consumption (Table 3).

Table 3. Effect of Probiotics in Different Ration Proteins on Protein Consumption of 10-week-old Hens

Addition of Probiotics	Dietary Protein		Mean
	P1	P2	
	----------(g)----------		
L1	238.70	216.59	227.65
L2	271.22	199.30	235.26
L3	243.25	187.35	215.30
Mean	251.05[a]	201.08[b]	226.07

[ab] Superscripts on the same line indicate significant differences (P<0.005)

The results of this study obtained protein consumption of 10-week-old native chickens of 226.07 is still low compared to the results of research by Sholeh et all., which is 356.31 due to the influence of differences in the length of feeding and protein levels in 11-week-old pelung chickens.[2] While the opinion of Suci that the provision of different rations based on the growth phase in poncing chickens with a feed protein content of 20, 18, 16 and 14% gives an influence on the final weight followed by consumption, ration conversion and body weight gain.[3] Protein consumption has a natural effect (P>0.05) directly proportional to ration consumption and actual

body weight. This study's consumption and body weight ratio amounted to 1,422.082 grams and 551.5 grams. According to Wahju, the size of protein consumption is influenced by the level of feed consumption.[4]

The increase and decrease of probiotics in different ration proteins did not yield significant protein consumption results. The role of probiotics in improving the performance of digestive tract organs is not the main factor in increasing nutrient absorption. The opinion of Safingi is that the provision of probiotics in livestock is to provide a stimulant to the absorption of nutrients, not as a single factor in the absorption of nutrients because many factors affect it, namely the process of administration, the environment and pH.[5] In his opinion, Elijah and Ofongo that probiotics can improve the performance of digestive organs and intestinal microflora, but the presence of probiotics needs to be balanced with a suitable environment for life.[6] One of the roles of probiotics is to provide immune stimulation against pathogenic microbial disorders. In the opinion of Houshmand, giving probiotics at a dose of 1.04 x 108 Cfu does not have a significant effect on the growth performance of broiler chickens because several factors such as environment, management, nutrition, dosage and livestock characteristics can affect the response of probiotics to broiler chickens.[7]

3.2 Digestibility of Protein

Based on the results of the study there was no interaction between the provision of probiotics and different ration proteins (P>0.05) on protein digestibility in 10-week-old native chickens. (Table 4).

Table 4. Effect of Probiotics in Different Ration Proteins on Protein Digestibility of 10-week-old Hens

Addition of Probiotic	Dietary of protein		Mean
	P1	P2	
	----------(g)----------		
L1	57.12	77.47	67.29
L2	61.92	53.12	57.52
L3	78.10	57.80	67.95
Mean	65.71	62.80	64.25

[ab] Superscripts on the same line indicate significant differences (P<0.005)

The protein digestibility value in 10-week-old native chickens with probiotics in different ration proteins amounted to 53.12 - 78.10, with an average value of 64.25. Lower than the results of Widjastuti's research, the value of protein digestibility obtained was 75%-90%.[8] Unlimited feeding results in fast intestinal performance, resulting in little digested feed because the intestinal opportunity to absorb food juice is relatively short, resulting in decreased digestibility. According to his research, decreased digestibility results in low absorption, so the body's opportunity to utilize feed nutrients becomes less. The decrease in digestibility is caused by the feed that enters is not limited, resulting in a shorter intestinal opportunity to digest.[9]

3.3 Retention of Nitrogen

Based on the results of this study, there was no interaction between probiotics and ration protein that differed significantly (P>0.05) on nitrogen retention in 10-week-old native chickens (Table 5).

Table 5. Effect of Probiotics in Different Ration Proteins on Nitrogen Retention of 10-week-old Hens

Addition of Probiotik	Dietary of Protein		Mean
	P1	P2	
	----------(g)----------		
L1	19.13	21.87	20.50
L2	20.48	17.76	19.12
L3	19.87	13.12	16.50
Mean	19.83	17.58	18,70

[ab] Superscripts on the same line indicate significant differences (P<0.005)

Excreta nitrogen retention in this study in 10-week-old native chickens amounted to 13.12 - 21.87 with an average of 18.70 grams. There was no Excreta nitrogen retention in this study in 10-week-old native chickens, which amounted to 13.12 - 21.87 with an average of 18.70 grams. There was no significant effect (P>0.05) on nitrogen retention due to differences in the provision of feed protein, which is 18%, 16% and 14%. As stated by Wahju, the high and low nitrogen absorbed by livestock is influenced by the quality of protein provided because the protein that enters the body of livestock is not all retained depending on the type and age of livestock.[10] Supported by Ewing that, in addition to retained protein is also used for energy so that the energy content of feed ingredients needs to be considered so that livestock needs can be met.[11] According to Djunaidi and Natsir, excreta nitrogen retention is obtained from the amount consumed minus the nitrogen in excreta.[12]

4 Conclusion and Suggestions

4.1 Conclusion

It can be concluded that there is no interaction of probiotics with different ration proteins on all parameters observed. However, different levels of ration protein significantly affect protein consumption.

4.2 Suggestions

It is recommended that more probiotics be given in the hope that they can affect all parameters.

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