Effects ofProbiotic Supplementationin Rations Containing Leubiem Fish Waste (Chanthidermis Maculatus) on the Performance of Local Ducks

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Abstract

The aim of this study is to determine the effect of probiotic supplementation in rations containing leubiem fish waste (Chanthidermis Maculatus) on the performance of local duck. The study used 192female local ducks 8-20 weeks old grower phase.The duckswere allocated into 4 treatments and 4 replications (12 ducks/pen). The female local ducks was fed ration contained 16% crude protein and 2700kkal/kgmetabolizableenergy.The experiment used completely randomized design with 4 treatment rations: P1 (basal diet/control);P2 (probioticsupplementation0,5% in rationscontaining 10% leubiem fish skin flour);P3 (probioticsupplementation1% in rationscontaining 10% leubiem fish head flour); P4 (probioticsupplementation1,5% in rationscontaining 10% leubiem fish bone flour).The observed variables were: feed consumption, body weight gain, final body weight, feed conversion, and mortality of local duck.Data were analiyzed byone-way analysis of variance then continued with Duncantest.The results showed that of probiotic supplementation in rations containing leubiem fish waste gave apositive response to the performance of female local duckgrower phase. Probiotic supplementation in rations containing leubiem fish waste(skinflour,head and bone) significantly affect ($P<0,05$) feed consumption, body weight gain, final body weight,and ration conversion, butno significant affect on mortality local duck growerphase. It was concluded that of probiotic supplementation 1% in rations containing leubiem fish waste (skin flour 10%) couldto increase body weight gain, final body weight and be able to reduce local duck mortality.

Keywords: probiotic, leubiem fish waste, local ducks, performance

1. Introduction

Increasing livestock production is not only reached by giving the right amount of nutrient (quantity and quality), but also optimizing production by giving feed additives in the form of prebiotic, probiotic, phytogenic and antibiotic. Feed additives that are very commonly used are antibiotics or better known as Antibiotic Growth Promoter (AGP) which serves to help fight pathogenic bacteria and consequently can increase livestock production.Antimicrobials, especially antibiotics in livestock are used as therapy, prevention of disease, and are also used as a growth promoter [1].

Scientifically, the use of AGP is considered successful and is abletoimprove the FCR value. However, the WHO has banned the use of AGP in livestock because it can adversely affect human health. Likewise, FAO, said that the use of antibiotics is a threat to humans, because microbes that should be able to be eradicated with antibiotics do not.The European Union has banned the use of antibiotics as a growth promoter since 2006 [2].But in Indonesia, the new AGP ban will come into force since January 1, 2018, The use of antibiotic growth

promoter (AGP) in feed has been banned by the Indonesian government. Therefore, the search for alternative AGP continues to be carried out. The addition of probiotic is one of the potential alternatives because it has the same ability as AGP.

Probiotics are a group of living microbes that are beneficial and are used to influence landlords through the improvement of microorganisms in the digestive tract [3].The most widely used probiotic microorganisms are Lactobacillus and Bifidobacteria strains [4].Probiotics used in this study were sourced from lactic acid bacteria (*L. caseiRhamnosus*) and supplemented in rations containing leubiem fish waste.Leubiem fish waste is one of the fish waste that has a high source of protein, minerals, phosphor and calcium which can be used as local duck feed ingredients.Utilization of fish waste is one alternative to reduce the cost of ration in the of ducks business [5].The research aims to study the effect of probiotic supplementation in rations containing leubiem fish waste on the performance of local duck.

2. Materials and Methods

The research material used 192heads female local duck 8-20 weeks old grower phase. Ration used in this experiment consisted of probiotic, corn, rice bran, coconut meal, soybean meal, sago, fish meal, coconut oil, premix, NaCl, and DCP.The study was conducted byexperimental method, using acompletely randomized design (CRD) with 4 treatments of rations and 4 replications (12 ducks/pen). The experiment used completely randomized design with 4 treatment rations:P1 (basal diet/control);P2 (probiotic Supplementation 0,5% in rationscontaining 10% leubiem fish skin flour);P3 (probiotic Supplementation 1% in rationscontaining 10% leubiem fish head flour); P4 (probiotic Supplementation 1,5% in rationscontaining 10% leubiem fish bone flour).

Treatment Rations

The ration used during the research was basal ration without antibiotics.All treatment rations use the same feed ingredients, only differing in the use of probiotics. Treatment rations is formulated according to the grower phase duck requirements: It contained 18 % crude protein and 2700 kkal/kg metabolizable energy (Table 1).

Table 1. Composition and nutrients content of the treatmentrations.

Feed Ingredients	TreatmentRations			
	P1	P2	P3	P4
		%		
Corn	38.5	40	37	37
Rice bran	17	18	18	18
Coconut meal	10	13.5	13	13
Soybean meal	24.3	7.5	12	10
Sago	7,2	8	7	9
Fish skin flour leubiem	0	10	0	0
Fish head flour leubiem	0	0	10	0
Fish bone flour leubiem	0	0	0	10
Coconut oil	1.5	1.5	1.5	1.5
Premix	0.5	0.5	0.5	0.5
NaCl	0.5	0.5	0.5	0.5
DCP	0.5	0.5	0.5	0.5
Total	**100**	**100**	**100**	**100**
Probiotic supplementation (%)	**0**	**0,5**	**1**	**1,5**

Calculated nutrients content:				
Metabolizable energy (Kcal/kg)	2702	2767	2706	2719
Crude protein (%)	18.02	18.12	18.08	18.15
Crude fiber (%)	5.92	6.66	6.55	6.95
Crude fat (%)	4.57	4.99	5.1	4.77
Ca (%)	0.28	1.09	1.36	1.07
P (%)	0.58	0.95	1.09	0.91

Experimental Procedure

This study used heads local duck 8 weeks of old and reared until 20 weeks of old in the litter cages system. The experiment lasted 12 weeks and during that time, feed and water were offered ad-libitum. Feed consumption and body weight gain were determined weekly. Final body weight, feed conversion, and mortality of local duck were determined at the end of feeding trial.

Research Variables and Data Analysis

The observed variableswere: feed consumption, body weight gain, final body weight, feed conversion, and mortality of local duck.Data was analyzed by using one-way analysis of variance then continued with Duncan's Multiple Range Test [6].

3. Results and Discussion

Rations Consumption

The average consumption of local ducks ration during the study were 953,19–1016,40grams per head per weeks (Table 2). The lowest feed intake was obtained from treatment P1 (control) andthe highest feed intake was found in treatment P4(probioticsupplementation1,5% in rationscontaining 10% leubiem fish bone flour).The data of local ducksperformance obtained in this study are presented in Table 2.

Table 2. The performances of local ducksprobiotic supplementation in rations containing leubiem fish waste.

Parameters	Treatment			
	P1	P2	P3	P4
Ration consumption (g/h/weeks)	953,19±37.4[a]	1004,22±35.1[b]	990,92±30.7[b]	1016,40±36.5[b]
Body weight gain (g/h/ weeks)	77,84±1,34[a]	85,82±1,38[b]	83,58±1,60[b]	81,34±1,29[b]
Final body weight (g/h)	1584,08±18,7[a]	1679,84±17,8[b]	1652,96±28,3[b]	1626,08±30,1[b]
Feed conversion ratio	7,22±0,50[a]	7,17±0,87[a]	7,19±0,73[a]	7,50±0,84[b]
Mortality (%)	0	0	0	0

Note: Different superscript in the same line means significantly different (P<0.05); P1 (basal diet/control); P2 (probioticsupplementation0,5% in rationscontaining 10% leubiem fish skin flour); P3 (probioticsupplementation1% in rationscontaining 10% leubiem fish head flour); P4 (probioticsupplementation1,5% in rationscontaining 10% leubiem fish bone flour).

The results showed that the use of probioticsupplementationin rationscontaining leubiem fish waste significantly affect (P<0.05) ration consumption of local duck. An

improvement of ration consumption was found in the local ducksprobioticsupplementationin rationscontaining leubiem fish waste(P2, P3 and P4), it was significantly higher (P<0.05) in compare to control ration (P1). The giving probiotic from local microbal have significant effect on ration consumption [7]. Ration consumption in livestock can be influenced by various factors, one of the main factors according to was the quality of feed including the nutrient content contained in the feed [8]. Found that ration consumption was also strongly influenced by the palatability of the rations, types, and composition of feed ingredients used in duck ration formulation [9]. In addition, the palatability of the ration is also influenced by the of the ration itself (10). Feed consumption influenced by various factors, including the nutrient content in the feed and the level of energy content in the ration (11).

Body Weight Gain

The average body weight gain of local ducks (8-20 weeks) during the study ranged from 77,84-85,82 g/head/weeks (Table 2). The results of statistical analysis showed that the use of probiotic supplementation in rations containing leubiem fish waste in local duck ration gave significant affect (P<0,05) on weight gain. This result suggested that the use of probiotic in the dietary as feed additive source increased the weight gain of local duck. The increasinge of livestock weight was strongly influenced by the consumption of rations [12].Several research reports show that the of probiotic is proven to increase growth performance, and improve feed conversion [13].

Final Body Weight

The results showed that the final body weight of local ducks ranged from 1584,08 – 1679,84 g/head (Table 2). Probiotic supplementation in rations containing leubiem fish waste had a significant effect (P<0.05) on final body weight of local ducks at 8-20 weeks.The highest final body weight was found in P2 treatment 1679,84 g/head and the lowest final body weight was found in treatment P1 1584,08 g/head.It can be seen that the use of 0,5% probiotic increased duck's body weight relatively higher than other treatments (P <0.05). The use of probiotic supplementation in rations containing leubiem fish waste can have a positive impact on improving the performance of local duck. The use of probiotic supplements in feed can improve performance, and improve the safety and quality of the meat produced [14].

Feed Conversion Ratio (FCR)

Feed conversion ratio (FCR) one of the variables used to see the ability of livestock to convert feed into meat products.Research results showed that the use of probiotic supplementation in rations containing leubiem fish wastelocal duck for grower stage during 8-20 weeks had significant effect (P<0.05) on ration conversion (Table 2).The highest FCR was found in P4 treatment 7,50 and the lowest FCR was found in treatment P27,17.The lower the value of the FCR, the lower amount of feed needed to increase a unit of body weight [15]. This finding suggested that the use of probiotic supplementation in rations containing leubiem fish wastein the growerlocal duck ration produced a similar FCR to the control feed.This finding suggested that the probiotic supplementation in rations containing leubiem fish wasteis able to provide the level of palatability, quantity and balance of nutrients and it is effective in promote growth of the ducks and improves feed to body weight conversion of the rations. The smaller the feed conversion rate, the more efficient the use of ration by livestock [16].

The value of feed conversion depends on the quality of feeds given to the animal. The higher the nutrient conceived the better the conversion of the resulting feed. This happens because with a good feed the livestock consumed less feed to produce the same body weight in compare to less good one. High growth reflecteds the efficiency of ration consumption and it can be seen from decreasing ration conversion rate[17].

Mortality

The results showed that the use of probiotic supplementation in rations containing leubiem fish wastedid not affect mortality of local duck. This suggests that the use of probiotic supplementation in rations containing leubiem fish wastemay be one of the sources of feed source in local duck ration as well as good and regular maintenance management. Provision of ration and regular water supply greatly affects the immune system of ducks. Cage hygiene also greatly affects the mortality of ducks, where dirty cages easily led to disease infection that caused death of the ducks. Good maintenance management can control and prevent disease on ducks and inhibit the occurrence of infection so mortality rate in ducks were minimized [18].Giving probiotic supplementary feed can have a positive effect on livestock immunity. Colonization of probiotic bacteria added to feed helps in the act of immunizing livestock in preventing colonization of pathogenic bacteria that contaminate feed [19].

4. Conclusions

It was concluded that of probiotic supplementation 1% in rations containing leubiem fish waste (skin flour 10%) could to increase body weight gain, final body weight and be able to reduce local duck mortality.

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