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The Effects of Leubiem Fish Waste (*Chanthidermis Maculatus*) As Protein Source in Rations on The Performance of Male Alabio Ducks

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Abstract

The aim of this study is to determine the effect of leubiem fish waste (Chanthidermis Maculatus) as a source of protein in rations on the performance of male Alabio duck. The study used 96 male Alabio ducks 8-14 weeks old grower phase. The duckss were allocated into 4 treatments and 4 replications (6 ducks/pen). The male Alabio ducks was fed ration contained 17-18 % crude protein and 2700 kkal/kg metabolizable energy. The experiment used completely randomized design with 4 treatment rations: R0 (control / 0% leubiem fish waste), R1 (basal diet containing 10% leubiem fish skin flour), R2 (basal diet containing 10% leubiem fish head flour) and R3 (basal diet containing 10% leubiem fish bone flour). The observed variables were: feed consumption, body weight gain, final body weight, feed conversion, and mortality of male Alabio duck. Data was analiyzed by Anova and Duncan test. The results showed that the use of leubiem fish waste gave a positive response to the performance of male Alabio duck. The use of leubiem fish waste (skin flour, head and bone) in ration significantly affect (P<0,05) feed consumption, body weight gain, and final body weight, but no significant affect on ration conversion and mortality male Alabio duck grower phase. It was concluded that the use of leubiem fish waste (skin flour 10%) could serve as a source of protein in duck ration and able to increase body weight gain, and final body weight of male Alabio duck.

Keywords: Leubiem Fish Waste, Alabio Ducks, Rations, Performances

Introduction

Leubiem fish (*Chanthidermis maculatus*) is one of the jebong or goat fish family which is one of the fish species found in the Indo-Pacific or Red Sea and Africa region to Southeast Asia, north of Japan and south to north of Australia and east west Atlantic. *Chanthidermis maculatus* or better known to people of Aceh as *leubiem fish*. It was commonly found on the coast of Thailand, Indonesia, Philippines and Japan (Zarry *et al.* 2017). Protein content of leubiem fish waste was high, ranging from 46.08 to 66.2%, it was higher than fish meal generally contained 53.7% (Nikijuluw, 2010). Utilization of the fish processing waste will give many advantages such as a source of protein in, animal ration

reduces environmental pollution, and sources of minerals in animal ration such as, phosphorus, calcium and vitamins.

One of the fish waste which have high protein, mineral, phosphor and calcium source is Leubiem fish waste (*Chanthidermis maculatus*) which can be utilized as duck feed ingredients. Utilization of fish waste is one alternative to reduce the cost of ration in the of ducks business (Gombo *et al*. 2015). Fish waste which consisting of head, the contents, of gastro-intestinal tract, meat, and bone, if it is fed freshly, it may harmful to the livestock. It needs to be processed prior to feeding (Nunung 2012). Processing fish waste does not only have high nutritional value but also provide a distinctive taste and aroma, have high digestibility and available amino acid (Abun *et al*. 2004). One of processing technique that can be applied is fish meal making (Widyasari *et al*. 2013). Baye *et al*. (2015) reported that utilization of fish waste flour in poultry ration increased feed consumption and body weight gain. The purpose of this study to determine the effect of leubiem fish waste as a source of protein in rations on the performance of male Alabio duck.

Materials and Methods

The research used 96 male Alabio ducks at grower phase. Ration used in this experiment consisted of leubiem fish waste (skin, head, and bone) corn, rice bran, coconut meal, soybean meal, sago, coconut oil, premix, NaCl, and DCP.

Treatment Rations

Treatment rations used were basal rations containing leubiem fish waste (skin, head and bone) formulated according to the grower phase duck requirements: It contained 17-18 % crude protein and 2700 kkal/kg metabolizable energy (Table 1).

Experimental Procedure

This study used 96 male Alabio ducks of 8 weeks of old and reared until 14 weeks of old in the litter cages system. The experiment lasted 6 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 male Alabio duck were determined at the end of feeding trial.

Statistical Analysis

The study was conducted for 6 weeks (age 9 - 14 weeks). The design used was completely randomized design with 4 treatment rations and 4 replications: R0 (control / 0% leubiem fish waste), R1 (basal diet containing 10% fish skin flour leubiem), R2 (basal diet containing 10% fish head flour leubiem) and R3 (basal diet containing 10% fish bone flour leubiem). The observed variables were: feed consumption, body weight gain, final body weight, feed conversion, and mortality of male Alabio duck. Data was analiyzed by Anova and Duncan test (Steel and Torrie 1993).

Table 1. Composition and nutrients content of the treatment ration

Feed Ingredients	R0	R1	R2	R3
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
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

Results and Discussion

Rations Consumption

The average consumption of male alabio ducks ration during the study were 142.66 - 152.18 grams per head per day (Table 2). The lowest feed intake was obtained from treatment R0 (control/ 0% leubiem fish waste) and the highest feed intake was found in treatment R3 (basal diet containing 10% fish bone flour leubiem). The data of male Alabio ducks performance obtained in this study are presented in Table 2.

The results showed that the use of leubiem fish waste (skin, head and bone) in ration formulation significantly affect ($P<0.05$) ration consumption of male alabio duck. An improvement of ration consumption was found in the male Alabio ducks fed 10% leubiem fish bone flour (R3), it was significantly higher ($P<0.05$) in compare to control ration (R0). Ration consumption in livestock can be influenced by various factors, one of the main factors according to Hernandez *et al*. (2004) was the quality of feed including the nutrient content contained in the feed. Daud *et al*. (2013) 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. In addition, the palatability of the ration is also influenced by the of the ration itself (Alaily *et al*. 2011). This is caused by rations formulated with leubiem fish waste flour gave a fresh smell and increased palatability of the rations. In addition, the high consumption of rations was also influenced by the taste, shape and content of these dietary proteins. High consumption of rations followed by increasing of protein consumption to meet the needs of amino acids for these animals, and protein efficiency was influenced by protein consumption (Liu *et al*. 2015; Varianti *et al*. 2017). Feed consumption influenced by various factors, including the nutrient content in the feed and the level of energy content in the ration (Fan *et al*. 2008).

Table 2. The performances of male Alabio ducks (9 - 14 weeks)

Parameters	Treatment			
	R0	R1	R2	R3
Ration consumption (g/h/day)	142.66±12.8[a]	150.31±4.40[ab]	148.32±7.16[ab]	152.18±8.75[b]
Body weight gain (g/h/day)	10,87±0,28[a]	11,98±0,38[b]	11,67±1,06[b]	11,37±1,12[b]
Final body weight (g)	1329,1±12,72[a]	1389,1±17,34[b]	1378,2±48,11[b]	1372,3±50,69[b]
Feed conversion ratio	4,4±0,37	4,6±0,15	4,5±0,05	4,7±0,25
Mortality (%)	0	0	0	0

Note: Different superscript in the same line means significantly different (P<0.05); R0 = 0% leubiem fish waste (control); R1= basal diet containing 10% leubiem fish skin flour; R2= basal diet containing 10% leubiem fish head flour; R3= basal diet containing 10% leubiem fish bone flour

Increasing consumption of ration containing leubiem fish waste (skin, head and bone) was also thought to be caused by the effect of the ration color. The basic color of fish skin (R1), head flour (R2) and bone flour (R3) is rather yellowish and bright. This is in line with Prayitno and Sugiharto (2015) statements which said that bright color of ration increased consumption of the rations.

Body Weight Gain

The weight gain of Alabio male ducks (8-14 weeks) during the study ranged from 10.87-11.99 g/head/day (Table 2). The results of statistical analysis showed that the use of leubiem fish waste (skin, head and bone) in Alabio male duck ration formulation gave significant affect (P<0,05) on weight gain. This result suggested that the use of leubiem fish waste in the dietary formulation as a protein source increased the weight of male Alabio duck. The increasinge of livestock weight was strongly influenced by the consumption of rations (Daud *et al*. 2017). Level of protein consumption was determined by the level of ration consumption, the more rations consumed, the more protein consumed. It may resulting in excess of protein in the body (Alyandari *et al*. 2014).

Final Body Weight

The results showed that the final body weight of male Alabio ducks ranged from 1329 - 1389 g/head (Table 2). Rations containing leubiem fish waste had a significant effect (P<0.05) on final body weight of male Alabio ducks at 8-14 weeks. The highest final weight was found in R1 treatment 1389,1 g/head and the lowest final weight was found in treatment R0 1329,1 g/head. It can be seen that the use of 10% leubiem leather skin flour increased duck's body weight relatively higher than other treatments, (P <0.05). Duck growth rate will be optimal if the genetic potential supported by feed proteins and energy contents that suits their needs (Dewanti *et al*. 2013).

Feed Conversion Ratio (FCR)

One of the variables used to see the ability of livestock to convert feed into meat-especially products is to look at the value of FCR. The lower the value of the FCR, the lower amount of feed needed to increase a unit of body weight (Apriliana Devi Anggraini *et al*. 2017). FCR results showed that the use of leubiem fish waste in Alabio duck feed formation for male grower stage during 9-14 weeks had no significant effect on ration conversion (Table 2).

This finding suggested that the use of leubiem fish waste in the grower Alabio duck ration produced a similar FCR to the control feed. This finding suggested that the formulated local diet containing leubiem fish waste is 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 (Arifah *et al*. 2013). 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 (Nurhayati *et al*. 2016).

Mortality

The results showed that the use of leubiem fish waste in feed formulation did not affect mortality of Alabio male duck grower phase. This suggests that the use of leubiem fish waste may be one of the most reliable sources of feed ingredients as a protein source in Alabio duck ration formulation 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 (Shandu 2014).

Conclusions

It was concluded that the use of leubiem fish waste (skin flour 10%) can serve as a source of protein in duck ration and able to increase body weight gain, and final body weight of male Alabio duck.

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