The Effect of Fish, Shrimp Head, and Crab Shell Meal in Different Proportions on Carcass, Liver, and Abdominal Fat Percentage of Super Native Chicken

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ABSTRACT
Fish meal, shrimp head, and crab shell were known as a fishery-by product with enough nutritional value as poultry feed. This study aimed to evaluate the effect of fish, shrimp head, and crab shell meal in different proportions on carcass, liver, and abdominal fat percentage of super native chicken. Ninety-six day-old super native chickens were divided into four treatments and four replications based on a completely randomized design. This study used a self-mixing feed consisting of BP11, yellow corn, rice bran, CAB concentrate, fish meal, shrimp head meal, and crab shell meal. The treatments were different levels of addition of fish meal, shrimp head flour, and crab shell flour, namely: P0 (control/100% of BP11), P1 (feed containing 11% fish meal+ 6% shrimp head meal), P2 (feed containing 11% fish meal + 6% crab shell meal), P3 (feed containing 11% fish meal + 3% shrimp head meal + 3% crab shell meal). The parameters measured in this study were the percentage of the carcass, liver, and abdominal fat of super native chicken. The data obtained were analyzed using analysis of variance and continued using Duncan's Multiple Range Test. The result showed that feed containing fish, shrimp head, and crab shell meal significantly affected the carcass, liver, and abdominal fat percentage of super native chicken. The average percentage of carcass ranged from 64.30–68.47%, liver 1.88–2.43%, and abdominal fat 0.24 – 0.70%. Providing 11% fish meal + 3% shrimp head flour + 3% crab shell flour on super native chicken feed resulted in the lowest abdominal fat content of 0.24%.

Keywords: *Fish meal, Shrimp head meal, Crab shell meal, Super native chicken.*

1. INTRODUCTION

Super native chicken is one of the poultry developed as meat-producing poultry in Indonesia. Super native chickens are produced from crosses between male domestic chickens and female laying hens [1]. In its development, the poultry business in Indonesia is experiencing problems in fluctuating feed prices. Some feed ingredients are still imported from abroad so the cost of feed is one of the high production costs [2]. One of the efforts that can be done is to use local feed ingredients, which are relatively cheap and available any time.

Fish meal is one of the local feed ingredients that has been widely used as a source of protein in poultry feed. In addition to fish meal, shrimp head flour and crab shell flour are by-products of the fishing industry that can be used as feed ingredients for protein sources for poultry. Shrimp head and shell flour are known to have a crude protein content of 32.60% [3], while crab waste flour has a crude protein content of 15.72 – 33.55% [4]. Several previous studies have shown that shrimp waste meal and crab waste can be used as poultry feed, but the combination of fish meal, shrimp waste meal, and crab waste information is still limited. Based on these conditions, a study was conducted on fish meal, shrimp heads, and crab shells in different proportions as feed for super native chickens and their effect on the percentage of carcass, liver, and abdominal fat of super native chickens.

2. MATERIALS AND METHODS

This study used 96 DOC of super native chickens, distributed into four treatments and four replications based on a completely randomized design. The feed used was BP 11 commercial feed and self-mixing feed consisting of yellow corn, bran, CAB concentrate, fish meal, shrimp head meal, and crab shell flour. Control and treatment feed had a metabolic energy content of 3,000 – 3,100 kcal/kg with a crude protein content of 22%. The treatments were:

P0 = BP 11 commercial feed

P1 = 45% yellow corn + 21% rice bran + 17% CAB + 11% fish meal + 6% shrimp head meal

P2 = 41% yellow corn + 21% rice bran + 21% CAB + 11% fish meal + 6% crab shell flour

P3 = 43% yellow corn + 21% rice bran + 19% CAB + 11% fish meal + 3% shrimp head flour + 3% crab shell flour

Feed and drinking water were provided ad libitum. The parameters measured in this study were the percentage of the carcass, liver, and abdominal fat of super native chickens. Data collection on the percentage of carcass, liver, and abdominal fat was carried out when the chicken waseight weeks old. The data obtained were analyzed using analysis of variance and continued with Duncan's multiple range test.

3. RESULTS AND DISCUSSION

The average percentage of carcass, liver, and abdominal fat of super native chicken in this study is presented in Table 1.

The results showed that the use of fish meal, shrimp heads, and crab shells had a significant effect (P<0,05) on the carcass percentage of super native chickens. The highest average percentage of super native chicken carcasses was obtained by treatment P0 (control), and the lowest was obtained by treatment P2. However, statistically, the percentage of carcasses of super native chickens on P2 was not different from that of super native chickens in P1 and P3. This result showed that the use of 11% fish meal + 6% shrimp head meal combination and 11% fish meal + 3% shrimp head meal + 3% crab shell meal combination in super native chicken feed had relatively similar growth rate as that of commercial feed (P0). The percentage of super native chicken carcasses obtained in this study was not much different from the results of previous studies, which reported the percentage of super native chicken carcasses ranging from 67.51 to 70.89% [1]. The results of this study are also in line with the results of previous studies, which reported that the carcass percentages of super nativechickens ranged from 53.04 – 62.69% [5], 54.00 – 69.60% [6], and 62,80 – 65% [7].

The results showed that the provision of fish meal, shrimp heads, and crab shells in the feed had a significant effect (P<0,05) on the percentage of super native chicken livers. The data in Table 1 shows that the P3 treatment significantly had a higher liver percentage than the P0 treatment (control) but did not differ from the super native chicken liver percentage in theP1 and P2 treatments. The average percentage of super native chicken livers obtained in this study is relatively lower when compared to the results of previous studies, which reported the percentage of native chicken livers ranging from 2.92 to 3.28% [8]. Super native chicken liver in this study was in normal condition, dark red, no color change was seen. This condition showed that fish meal, shrimp head, and crab shells do not contain harmful substances that can cause physiological changes in the liver of super native chicken.

The results showed that the provision of fish meal, shrimp heads, and crab shells had a significant effect (P<0,05) on the abdominal fat percentageof super native chickens. Super native chickens fed a diet containing 11% fish meal + 3% shrimp head meal + 3% crab shell meal had lower abdominal fat content than super native chickens fed commercial feed (0.24% vs. 0.70%). The abdominal fat percentage of super native chickens in this study was lower than the average percentage of abdominal fat of previous studies, which reported the percentage of abdominal fat in super native chickens ranging from 0.63 – 1.05% [7] to 0.84 – 1.44%. [6]. The provision of fish meal, shrimp heads, and crab shells significantly reduced the abdominal fat percentage of super native chickens. The same thing was also reported in previous studies. Fish meal substitution using fermented shrimp head waste flour in broiler chicken feed significantly reduced the abdominal fat content. Chitin contained in shrimp head waste is degraded to form glucosamine. Glucosamine can affect the amount of fat absorption and fatty acid synthesis [9].

Table 1. The Average Percentage of Carcass, Liver, and Abdominal Fat of Super Native Chicken

Variables	Treatments			
	P0	P1	P2	P3
Carcass percentage (%)	68.47^{a}±1.01	65.44^{ab}±1.36	64.30^{b}±0.89	65.71^{ab}±0.74
Liver percentage (%)	1.88^{b}±0.13	2.17^{ab}±0.21	2.19^{ab}±0.11	2.43^{a}±0.27
Abdominal fat percentage (%)	0.70^{a}±0.26	0.33^{ab}±0.09	0.29^{ab}±0.07	0.24^{b}±0.06

Note: Different superscript on the same line indicated significant difference between treatments

4. CONCLUSION

It can be concluded that the provision of feed containing fish meal, shrimp heads, and crab shells with different proportions significantly affects the percentage of the carcass, liver, and abdominal fat of super native chickens. 11% fish meal + 3% shrimp head flour + 3% crab shell flour in super native chicken feed resulted in the lowest abdominal fat content.

ACKNOWLEDGMENTS

The author would like to thank the National Support for Local Investment Climate/National Support for Enhancing Local and Regional Economics Development (NSLIC/NSELRED) for research funding support and the Faculty of Animal Science, Halu Oleo University, which has provided support for research facilities.

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