THE EFFECT OF DIETARY CRUDE FIBRE LEVEL ON THE FINAL BODY WEIGHT, CARCASS WEIGHT, GIZZARD WEIGHT AND LENGTH OF INTESTINE IN SENTUL CHICKEN

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Abstract

The research was held to find out of the effects of level crude fiber in the ration on the carcass weight, gizzard weight and length of intestine at sentul chicken. The research used 100 day old Sentul chickens. Crude fiber treatments in the ration were 6% (R1), 8% (R2), 10% (R3), and 12% (R4).The method used Completely Randomized Design (CRD), with five treatments and where each treatment was repeated five times and each repeated consist of five native chicks. Variable analyses were carcass weight, gizzard weight and the length of intestine. The research showed that from 6% to 8% crude fibre in the ration give the optimal results on the carcass weight, gizzard weight and the length of intestine. At 10-12% crude fibre in the ration, carcass weight was decrease, gizzard weight and the length of intestine was increase. The conclusion that the maximum crude fiber level needed in Sentul chicken rations was 8 %.

Key words: crude fiber, carcass weight, gizzard weight, the length of intestine, Sentul chicken

INTRODUCTION

Sentul chicken is a specific one which come from Ciamis region in West Java with grey feathers as its distinctive feature, with a variation of grey and brown yellows feathers and orderly arranged feathers in its breast like dragon scales [12]. This kind of chicken is very potential because rapid growth and high productivity of eggs [5].

Fiber is naturally present in plant-based feed ingredients and is an important component in poultry diets. Previous studies have reported a negative impact of fiber sources on daily feed intake, growth performance, and nutrient digestibility [2, 3]. Crude fiber components that exceeds the maximum limit will reduce the digestibility of the ration. The decrease in digestibility of the ration is due to the fact that most of the feed ingredients will come out with faeces, before being absorbed by the intestine, which in turn will reduce the body weight of the chicken. Rations with high crude fiber content can reduce body weight because crude fiber will stay in the digestive tract in a relatively short time, so absorption of nutrients decreases. Rations that contain high fiber will provide a sense of satiety because the composition of complex carbohydrates that stop appetite, resulting in a decrease in ration consumption [11]. Rations that contain low crude fiber, can reduce body weight because it will cause satiety due to input from the carbohydrate complex which causes a decrease in appetite because its will be consumed less in accordance with the capacity of the crop (cache) and will result in a decrease in body weight so that the resulting carcass weight will be small [12]. And will increase the weight and length of the digestive tract, and increase the secretion of pancreatic gland fluid [7]. The internal organs that are affected by the high crude fiber in the ration are the gizzard, which will work harder in destroying the ration. This situation results in a larger and thicker size of the gizzard. The same thing happens to the intestine, whose size becomes longer and its diameter becomes larger because the high level of crude fiber reduces the chance of digestion of food, and physiologically the intestine will adjust to become more elongated [4].

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The need for crude fiber in the formula of rations needed 2 - 11%, while NRC (2004) explained that the maximum crude fiber level needed in broiler and layers rations was 8%. From the results of the study giving crude fiber below 6% in the ration does not have a significant effect on carcass and internal organ weights [4].

Giving crude fiber above 8% will cause the ration rate in the digestive tract to be slow, and the intestinal contraction becomes longer, as a result the intestine becomes longer [7].

Seeing the real effect of giving crude fiber levels in chicken rations, it is necessary to conduct research to determine the effect of crude fiber levels on Final body weight, carcass weight, gizzard weight and intestinal length of sentul chickens.

MATERIAL AND METHOD

One hundred native chickens at two weeks of age were raised in cages until 12 weeks old. A Completely Randomized Design with four treatments fiber level in the diets, namely 6 % (R1), 8 % (R2), 10 % (R3), and 12% (R4), replicated five times and where each replication consisted of five chickens. Rations were prepared based on protein and metabolic energy requirement for sentul chicken growth phase, ie.17 percent protein and metabolic energy 2900 kcal/kg (Widjastuti, 1996). The composition of experimental rations are in Table 1 and the nutrient and metabolism energy content of four treatments are in Table 2.

Table 1 Composition of experimental rations

Ingredients	Treatment			
(%)	R1	R2	R3	R4
Yellow corn meal	58.5	57.0	54.5	53.5
Rice Bran	14.0	12.0	10.0	11.0
Soy-bean meal	4.0	5.5	7.0	7.5
Coconut cake meal	8.5	6.0	4.0	2.0
Reeds meal	4.5	9.0	14.0	17.0
Fish meal	6.5	8.5	8.0	8,0
Coconut oil	1.0	1.0	1.0	1.0
Grit	0.5	0.5	0.5	0.5

Table 2 The Nutrient and Metabolism Energy Content in Rations

Nutrition component	R1	R2	R3	R4
Crude protein (%)	17.32	17.22	17.28	17.15
Crude fat (%)	6.81	6.35	6.10	6.12
Crude fiber (%)	6.20	18.81	10.18	12.06
Ca (%)	0.92	0.90	0.89	0.86
Phospor (%)	0.68	0.65	0.63	0.63
Energy metabolism (Kcal/kg)	2980.88	2946.36	2902.35	2900.23

The measured variables were final body, carcass weight, gizzard weight and length of intestine at Sentul chicken. Statistical test performed by analysis of variance and differences between treatments effects were examined using Duncan's multiple range test.

RESULTS AND DISCUSSION

The effect of fiber level in the ration on final body weight, carcass weight, gizzard weight, and the intestine length of native chicken, is shown in Table 3.

Table 3 The final body weight, carcass weight, gizzard weight and the intestine length of Sentul chicken

Variables	P_1	P2	P3	P4
Final body weight (g)	739.50 a	709.75 a	627.80 b	589.50 b
Carcass weight (g)	525.84 a	520.70 a	432.70 b	380.65b
Gizzard weight (g)	15.45 a	16.01 a	17.56 a	18.06 b
Intestine length (Cm)	16.76 a	16.46 a	17.77 b	17.90 b

Final Body Weight

The average of final body weight of each treatment is shown in Table 3. The average of final body weight that highest P1 treatment (739.50 g) and the Lowest was P34 (589.50 g). The results variance analysis showed that treatments of level fiber in the ration has significant effect ($P < 0.05$) on final body weight. By used level fiber until 8 percent in the ration of Sentul chicken still gave a good result and gave the same response with the ration treatment P1 (ration of 6 percent). This fact makes it clear that crude fiber in rations can only be given up to 8 percent so that the final weight of sentul chicken does not decrease. This is in line with the recommendation of NRC (2004) that the crude fiber content in the ration is a maximum of 8 percent. In treatment P3 and P4, the final weight produced decreases. This is because the level of crude fiber in the ration is relatively high. Rations containing a level of crude fiber above 10 percent will reduce body weight, because the feed ingredients in the ration that should be absorbed will be carried out with the faeces. This proves that the tolerance of crude fiber levels in rations is only up to 8 percent.

Carcass Weight

The average weight of carcass are ranges from 380.65 - 525.84 gram. The results of variance showed that the treatment of crude fiber levels in the ration gave a significant effect on carcass weight. From Table 3. It can be seen that between treatment P1 (525.84 g) and P2 (709.75 g) are not significantly different, meaning that the use of crude fiber in the ration of 6 percent and 8 percent results in the same carcass weight. In treatment P1 and P2 the weight of the carcass produced was higher ($P <0.05$) when compared to P3 (432.70 g) and P4 (380.65). This is caused the crude fiber in the ration in treatment P3 and P4 is quite high, so it will reduce body weight which in turn will also decrease the carcass weight. Carcass weight between the P3 and P4 rations is not different because carcass weight has a relationship with life weight. This proves that the use of crude fiber levels above 8 percent in the ration is less supportive of carcass weight.

Gizzard weight

From Table 3, the highest average gizzard weight was obtained from chickens that received R4 ration (18.06 g), and the lowest was obtained from chickens that received P1 ration, which was 15.45 g. The results of statistical analysis that the treatment of giving crude fiber level in the ration significantly affected the weight of gizzard. The use of 6 percent crude fiber and 8 percent gizzard weight is not significantly different, this means that the use crude fiber in the P1 and P2 rations is still within the limits that can be tolerated by the chicken, so the gizzard is not too heavy in digesting the ration which ultimately causes gizzard weight in normal condition. The resulting gizzard weight in the P3 treatment (17.56 g) is the same height as the P4 (18.06 g), because the ration provided contains a crude fiber level above the tolerance limit. In accordance with the recommendation of NRC (2004) that the maximum limit of crude fiber in chicken rations does not exceed 8 percent. As you know that the gizzard serves to grind feed ingredients into small particles and if the rough fiber in the ration is too high it will cause the gizzard to work harder which turns the gizzard thickened and enlarged. In accordance with the opinion of Weiss and Scott [10] which states that increased crude fiber in the diet can increase the contraction of the gizzard when digesting crude fiber.

Length of Intestine

The mean length of intestine in each treatment ranged from 16.46 to 17.90 cm. Statistical results showed that the treatment of crude fiber content in the ration gave a significant effect (P <0.5) on the length of the intestine. Intestinal length in treatment P1 (16.76 cm) and P2 (16.46 cm) were shorter than the length of chicken intestine. Sentul given the treatment ration P3 (17.77 cm) and P 4 (17.90 cm). This is due to the crude fiber content in the treatment of P3 (10%) and P4 (12%) rations higher than the P1 (6%) and P2 (8%) , meaning that the use of crude fiber in rations above 8% can cause intestinal more long, because rations with high crude fiber cause the ration rate in the digestive tract to be slow, and the intestinal contractions become longer. As a result the intestines become longer, in line with the results of Abdelsami et al. [1] study that high crude fiber in the ration will increase intestinal length per kilogram of body weight. Between treatment P3 (10%) and P4 (12%) did not show any significant differences in intestinal length. This means that crude fiber with a level of 10-12% in the ration can no longer increase the length of the intestine. This is because the intestine also has the habit of adjusting to the content of crude fiber in the ration

CONCLUSION

Based on the results and discussion can be concluded that the ration with a crude fiber level to the level of 8 percent gives optimum results for the final body weight, carcass weight, gizzard weight and intestinal length in the Sentul chicken in the growth period.

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