

THE UTILIZATION OF FAST FOOD WASTE PRODUCT ON THE PROTEIN EFFICIENCY RATION OF LOCAL MALE DUCK

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Abstract

Day old male local ducks are the hatching duck eggs by product, that could be raised intensively as ducks meat, because very cheap and by fast growing age of eight weeks can be harvested, and slightly fatty. Friend chicken fast food restaurant waste product as bone and meat which rich of high level of protein and utilized for alternative feed local ducks. Waste product contains 50.18 % crude protein, so it can be used as an alternative source of animal protein feed. The experiment using the fast food restaurant waste going as meat and bone meal (MBM) and utilized of its to increase duck meat production. The experiment was held to find out of protein efficiency ratio of male local ducks fed diets containing fast food waste (MBM). One hundred day old local male ducks were raised in cages until eight weeks old. The experiment conducted with Completely Randomized Design, five meat and bone (MBM) meal levels in the ration, namely: 0 % (R0), 5 % (R1), 10 % (R2), 15 % (R3), and 20 % (R4), repeated five times, where each replication consist of five local male ducks, and continued with Dunnett test, if there were any significantly differences among the treatments. Feed consumption, protein consumption, body weight gain and protein efficiency ratio were parameters observed. The result indicated that fast food restaurant waste (MBM) doesn't give negative effect on feed consumption, protein consumption, body weight gain and protein efficiency ratio. The real conclusion of this experiment that by giving fast food restaurant waste going as meat and bone meal until 20 percent gave the best protein efficiency ratio of local male duck.

Key words: Fast food restaurant waste product, local male duck, meat and bone meal, product, protein efficiency ratio.

INTRODUCTION

Male Day old ducks are by-product of the local ducks hatching, Local male ducks feasible for intensively reared meat producers, because it's cheap, fast-growing, and slightly fatty, more efficient in use of ration than female ducks (Bakrie et al 2006; Srigandono, 1996). The optimal ducks growth rate achieved by the age of 6-8 weeks, and generally male ducks harvested at 8 weeks (Hardjosworo and Rukmiasih, 2001). To obtain the maximum yield needs to be balanced with the provision of rations qualities, and rations are balanced and proportionate nutrient content. Ration of quality feed ingredients should be supported by well qualified (Leeson and Summers, 2001). Rations quality usually are relatively expensive, so it would have an effect on the production cost. The solution needs to look for alternative feed ingredients capable in substituting a price relatively cheaper, but still good quality expected to reduce production

cost. Fast food restaurant selling dishes from chicken, lots of waste disposal in the form of residual bone with a little meat attached. It is predicted that a fast food restaurant (looks like KFC) was able to spend an average of 125 chickens per day, with a cut into 8 pieces so that the fried chicken products are sold every day, totaling 1000 pieces and approximately 60% (600 pieces) consumed in restaurant. From one piece of chicken waste is expected to generate as much as 10 gram, that of the 600 pieces of waste generated as 6 kilo grams per day. Waste in the form of residual bone and little meat attached, disposed of as waste (Supratman, 2008). In order to optimize the utilization of waste as a source of fast food restaurants feed ingredients, processing needs to be done by processed into meal, called meat and bone meal, and can be used as feeding ducks because of high nutrient content of crude protein content of 63.23%, crude fat 14.53 %, and 10.72% mineral (Poultry Nutrition, Non

Ruminant and Industrial Laboratory, 2007). High protein and mineral content with calcium and phosphor which derived from bone waste was able to be an alternative ingredient mixture rations for male local ducks. Growth is a very complex process that includes body weight gain due to changes in the shape and weight of the tissues except fat tissue (Cherry and Morris, 2008). Feed intake should affect the rate of growth achieved. Consumption and high protein content in the ration will affect protein consumption (Wahyu, 1992). Protein is essential organic substances and essential for growth and production (Leeson and Summers, 2005). To determine the biological evaluation of protein quality is needed to see its effect on livestock. One of the measures of protein quality is the protein efficiency ratio (PER), which is simply the weight gain of animal divided by protein intake (Leeson and Summers, 2005). PER is best that could produce a high number, and it indicates a good quality protein. Until now there is no information about the PER value in using of rations containing meat and bone meal given from a local male ducks. Meanwhile, local male duck is prospective in supply of animal protein of birds, so we need research toward quality protein ration that will give the best weight resulting affect.

MATERIALS AND METHODS

The research used 100 DOD local male ducks, with the average of body weight was 39.87 gram and 8.97% percent of variable coefficient. The ducks kept in flock over 8 weeks, as much as 20 flock, and each flock consisted of 5

ducks. Every flock is equipped by feeder and round waterer, 25 watts of bulb lamp as heater and hanging in the middle of each flock, where a 10 watt of tube lamps as house light.

The ration consisted of yellow corn-meal, fish meal, rice bran meal, soy-bean meal, meat and bone meal, rice polished, salt and premix as additive feed in 22 percent protein and 2900 Kcal/kg of metabolisable energy (Scott and Dean, 1991). The meat and bone meal (MBM) were made from fast food restaurant waste product in the Poultry Nutrition, Non Ruminant and Industrial Laboratory, Faculty of Animal Husbandry, Padjadjaran University West Java.

The ration treatments consisted of:

R₀ = Ration control, without meat and bone (MBM) meal

R₁ = Ration contained 5 percent meat and bone meal

R₂ = Ration contained 10 percent meat and bone meal

R₃ = Ration contained 15 percent meat and bone meal

R₄ = Ration contained 20 percent meat and bone meal

The formula composition of ration is showed in Table 1, and the metabolisable energy and nutrient content in Table 2. Completely Randomized Design was used in this experiment with 5 treatments, and each treatment repeated 5 times. Then the data was analyzed by Random Simple Test, and among treatments with Dunnet Test (Stell and Torrie, 1989). Variable analysis were feed consumption, protein consumption, body weight gain, and protein efficiency ratio.

Table 1. Composition of The Formula Rations (%)

| Ingredients | Ration | | | | |
|------------------|--------|--------|--------|--------|--------|
| | R0 | R1 | R2 | R3 | R4 |
| Yellow corn meal | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 |
| Soy-bean meal | 6.65 | 6.45 | 6.02 | 5.70 | 5.40 |
| Rice bran meal | 17.25 | 17.25 | 17.24 | 17.20 | 17.15 |
| Fish meal | 20.00 | 15.00 | 10.00 | 5.00 | 0.00 |
| Rice polished | 5.00 | 5.30 | 5.64 | 6.00 | 6.35 |
| MBM meal | 0.00 | 5.00 | 10.00 | 15.00 | 20.00 |
| Salt | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| Premix | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

Table 2. The Nutrient and Metabolism Energy Content in The Rations

| The Nutrients | R0 | R1 | R2 | R3 | R4 |
|--------------------------------|-------|-------|-------|-------|-------|
| Crude Protein (%) | 22.01 | 22.01 | 22.00 | 22.00 | 22.00 |
| Crude Fat (%) | 5.32 | 4.85 | 4.39 | 3.92 | 3.45 |
| Crude Fiber (%) | 6.25 | 6.54 | 6.62 | 7.11 | 7.39 |
| Calcium (%) | 1.40 | 1.13 | 0.85 | 0.58 | 0.30 |
| Phosphorus (%) | 0.69 | 0.55 | 0.41 | 0.27 | 0.13 |
| Metabolisable Energy (Kcal/kg) | 2.900 | 2.900 | 2.900 | 2.900 | 2.900 |

RESULTS AND DISCUSSIONS

Table 3. The Feed consumption, Protein Consumption, Body Weight Gain, and Protein Efficiency Ratio

| Variables | R0 | R1 | R2 | R3 | R4 |
|----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Feed Consumption (gram) | 3022.45 ^a | 3052.35 ^a | 3275.04 ^b | 3369.11 ^b | 3473.52 ^b |
| Protein Consumption (gram) | 664.94 ^a | 671.52 ^a | 720.51 ^b | 741.20 ^b | 771.12 ^b |
| Body Weight Gain (gram) | 758.25 ^a | 789.70 ^a | 848.40 ^b | 907.05 ^b | 1019.20 ^b |
| Protein Efficiency Ratio | 1.14 ^a | 1.18 ^a | 1.18 ^a | 1.22 ^b | 1.32 ^b |

Note : The similar superscript in the same row show non significant difference ($P < 0,05$)

The feed consumption, protein consumption, body weight gain, and protein efficiency ratio are showed in Table 3.

Feed Consumption

Table 3 shows that feed consumption tends to increase proportional because of meat bone meal increased in the ration.

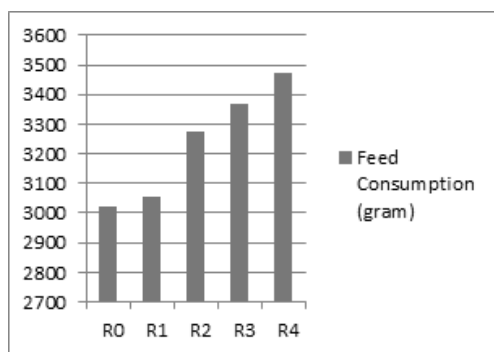


Figure 1. Feed Consumption

The results variance analysis showed, by giving meat and bone meal until 20% in the ration providing significant effect ($P < 0,05$) on ration consumption. Average consumption of rations in the treatment uses 10%, 15% and 20% meat bone meal was significantly higher compared with the control ration consumption. While by using of 5% meat and bone meal showed no significant difference with the control ration. Increased feed consumption on rations containing meat bone meal are palatable

because of the higher value. According (North and Bell, 2004) palatability is a major factor affecting consumption and palatability ration depend on texture, smell and taste, although taste not an important role in poultry

Protein Consumption

Protein consumption is obtained by calculating the amount of ration consumed multiplied by the protein content of the ration (Table 2).

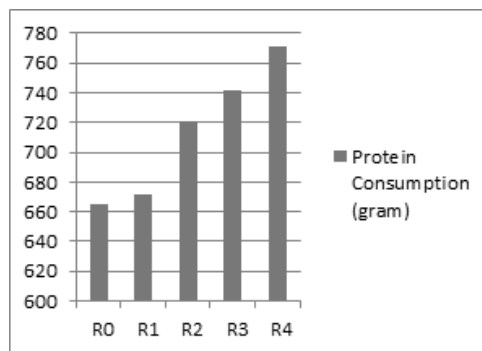


Figure 2. Protein Consumption

Analysis of variance showed that by addition of meat and bone meal in the ration has significant effect ($P < 0,05$) on protein consumption. From Dunnet Test results showed that an increase in protein consumption in line with the increasing of meat bone meal addition in the ration. This means that rations containing meat and bone meal more palatable, thus by

increasing the consumption of rations will have an impact on increasing of protein intake. The better quality of the ration, the higher consumption of rations, so that more nutrients including protein absorbed by the body which finally result in good growth. These results agree with the opinion of (Cherry and Morris, 2008; Scott and Dean, 1991), where the consumption of protein is affected by the rations consumption and protein content in the ration which will ultimately affect the growth of ducks.

Body Weight Gain

The body weight gain of each treatment is showed in Table 3. The average of body weight gain was 758.25 – 999.20 gram, showing that duck's feeding increase because of there were meat and bone meal composition in rations.

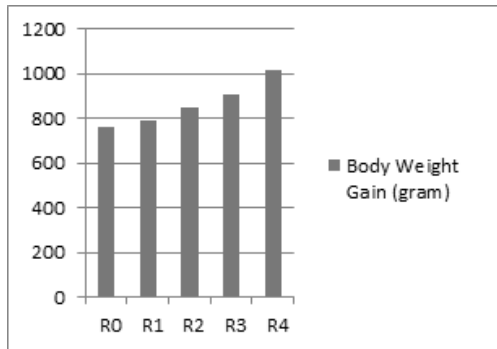


Figure 3. Body weight gain

Analysis of variance showed that by addition of meat and bone meal has significant effect on body weight gain of male local duck. By adding the meat and bone meal until 20 percent in the ration of male local duck still gave a good result. The result was parallel on feed and protein consumption those were also no significant different ($P > 0,05$) among the treatment 10 %, 15% and 20% meat and bone meal (R2, R3 and R4) in the ration but significant different to R0, (without meat and bone meal) and R1 (2.5% meat and bone meal). Its mean that the meat and bone from 10 percent up until 20 percent in ration did not influence palatability and duck appetite, so the body weight gain was increased. This is because of protein content in meat and bone meal is more better (63.23%) than fish meal

protein (54.43%), fat is also higher, at 15.85%, while 8.69% on fish meal. Animal protein from meat and bone meal has a composition similar to the form of the protein inside the duck's body, making it easier for ducks to realignment would be a form of protein to the muscles. Because of that, the body weight gain gave better, than the control treatment without meat bone meal.

Protein Efficiency Ratio

In Table 3 can be seen that highest of protein efficiency ratio on male local duck which receiving 20 percent meat and bone meal in the ration R4 (1.32), and the lowest was R0 ,ration without meat and bone meal (1.14). The results of variance analysis showed that the treatment by using of meat and bone meal gave significantly affected on protein efficiency ratio. This means that the use of meat and bone meal to 20% in the ration produces more better quality than the control ration. This is due to the protein content of meat bone better than fish meal protein, so that the resulting quality of rations is also better. And because the content of amino acids meat and bone meal derived from chicken similar to amino acids in the body of duck, then it is not difficult to change the amino acid feed into meat fibers in duck body.

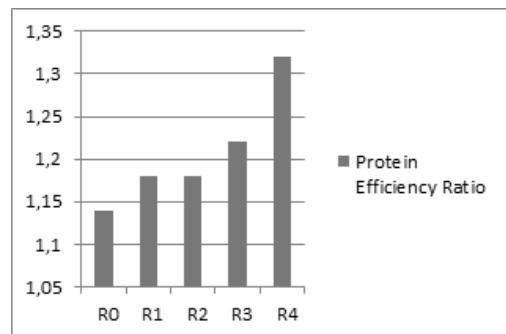


Figure 4. Protein Efficiency Ratio

According to (Leeson and Summers, 2005) a high quality protein will promote more weight gain per unit of protein consumed than will a low quality protein. This is evident from the body weight gain in the treatment of meat bone meal additions higher than the control ration. Scott, and Dean (1991) states that the Protein Efficiency Ratio in the ration directly related to

the biological value of protein ration itself. When seeing from the feed consumption, protein consumption and body weight gain were significantly higher then the resulting Protein Efficiency Ratio also higher. So meat bone meal can be used as an alternative feed ingredients for animal protein supplements of fish meal. Cherry and Morris, (2008) said that protein quality was not only reflected in the amount of protein contained in the feed material or of the amount required but determined by the quality.

CONCLUSIONS

It was concluded that by using the meat and bone meal until 20 percent level in the ration was still able to produce an optimal result on Protein Efficiency Ratio and meat bone meal can be an alternative source of animal protein feed.

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