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Effect of Supplementation of Combination of Curcuma and BSF Maggot Meal in Rations on Accumulative Weight of Native Chickens

W L Toar¹, L J M Rumokoy², E Pudjihastuti¹, H Manangkot¹, B Bagau¹ and I M Untu¹

¹Faculty of Animal Science, University of Sam Ratulangi, Manado, Indonesia

²Postgraduate School, University of Sam Ratulangi, Manado, Indonesia

E-mail correspondence: wisje_toar@live.com

Abstract. The purpose of this study was to determine the role of the combination of curcuma meal with maggot of insect larvae of *Hermetia illucens* on accumulative weight gain in native chicken. Methods: This study used 60 starter chickens, which were divided into two groups of 30 chickens as control group (P1) and the other one (P2) that received a supplement of combination of curcuma meals of 350gr/100 kg ration and maggot BSF of 150gr/100 kg ration which was maintained for fourth weeks. The ration was distributed ad libitum. Final weight gain was measured at the end of the study at the fourth week. The data obtained were analyzed by using t-test. The results indicated that the average body weight of experimental chicken P2 was 214 gr significantly higher ($P < 0.01$) than in group P1 was 243 gr. This results show that maggot meal of *H. illucens* has an important nutrient content and has a positive effect when combining with curcuma meal which is able to increase consumption palatability which has a direct effect on local chicken weight gain. Conclusion: The combination between BSF maggot and curcuma meals supplementation could be applied to local chickens in supporting organic livestock production.

Keywords: BSF, curcuma, insect, native chickens

1. Introduction

Native chicken has a relatively slower growth rate compared to purebred chicken, but has the advantage in terms of balance consuming low protein feed to produce meat that tends to be more desirable for consumers. Production of native chickens became an important source to contribute in organic food need. The local chickens are able to use natural resources around the farm, but pure



traditional maintenance systems have various limitations in achieving optimal body weight. [3] reported that a conventional protein sources were suitable to completely satisfy the increment of feed production in a sustainable way. The use of local natural resources [13] and [14] such as insects [12] and curcuma plant can give new hope in increasing the productivity of farms native to the organic chickens. Curcuma plants grow well in various humid tropical regions [7].

Various previous studies on a condition of small-scale local chicken farms by traditional maintenance in Minahasa region show that generally these poultry were kept inferior of twenty birds, with a tendency of lack quality [4] and [12]. The constraints faced by local chicken farms, in humid tropical regions were about a low quality nutritious supply for their chickens, consequently in an increasing of health problem in their livestock [8]. The use of BSF maggot is suitable in tropics areas in meeting the nutritional needs of local chickens traditionally maintained because maggot or BSF larvae contain a lot of nutrients needed by livestock such as amino acids and macro minerals and micro minerals [9].

H. illucens (BSF) is easy to rear, and its utilization could improve the performance of broiler chickens. [11] stated that protein components have an important role for chicken animals in the growth phase for the formation of body tissues and its nutrition component could actively involve in vital metabolism in relation with enzymes, hormones, and for immuno-nutrient needs [10]. In addition, beside the role of insects, curcuma meal can be added to broiler feed because it can improve the mechanism of the digestive organs, stimulate the release of pancreatic sap which contains the enzyme amylase, lipase and protease.

2. Methodology

Sixty native chickens were obtained from local poultry farm. The DOC chickens were collective maintained in a box during the first week of experiment, and divided by group in second week. The animals were divided into two groups: 30 chickens as control group (P1) and the other one (P2) that received a supplementation of combination of curcuma meals of 350gr/100 kg of ration and BSF maggot of 150gr / 100 kg of ration. The final of body weight measured at fourth weeks of age. The ration was distributed *ad libitum*. The protein of ration during first week was 19% crude protein, fat 5%, crude fiber 5%. This complete ration was obtained as a chicken commercial feed (AD1) and then the composition of the ration was gradually changed to be 50% of AD1 mixed with 50% of corn at the end of 3rd week until 4th weeks of experiment, as a consequence the nutrient composition of ration became: protein 16.1%, fat 4.02%, fiber 3.5%.

Final weight gain was measured at the end of the study at the fourth week. The data obtained were analyzed using t-test.

3. Result and Discussion

The data obtained in this experiment is represented in **figure 1** indicated that the average of body weight of chickens P2 was 243 gram significantly higher ($P < 0.01$) than in group control P1 which was 214 gram. It was clear that the influence of distribution of combination of curcuma meal and *H. illucens* on chicken's body weight improvement.

This performance could be linked with the maggot meal of *H. illucens* that has a important nutrient content and has a positive effect when combining with curcuma meal which is able to increase consumption palatability which has a direct effect on local chicken weight gain [2]. According to [1], insect meal is rich in protein for about 40 to 50 percent, with a greater concentration of essential amino acids than soybean meal, while BSF meal contains higher levels of threonine, valine, isoleucine and leucine compared to fishmeal.

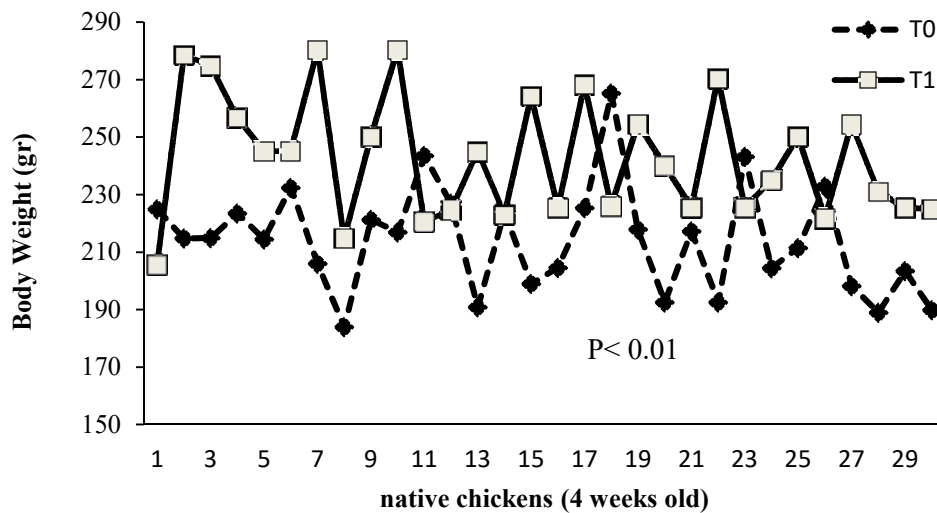


Figure 1. The graph of body weight of the experiment animals at fourth weeks of age

In other side, the achievement of body weight in group P1 could be related to the role of curcuma in counteracting pathogenic micro-organisms found in livestock environment as related to the report of [5]. A study [6] also showed a reduction of parasite by treating the experimental animal with curcuma extract in water drinking.

The effect of curcuma flour on weight gain can be attributed to the role of curcumin by assuring animal health based on [7] showed that curcumin in curcuma has an important in the health management through its anti-inflammatory effects although this kind of anti-inflammatory effects are not entirely understood. The curcumin interacts in the body by inhibiting the enzymes of cyclooxygenase-2 and 5-lipoxygenase so its protect against pathogenesis agent.

4. Conclusion

The combination of BSF maggot meal and curcuma meals supplementation in ration could be applied to local chickens feeding in supporting to organic livestock production improvement.

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