Coprase Produced by *Aspergillus niger* and *Trichoderma* spp Improved Broiler Performance Fed Copra Meal Based Diets

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ABSTRACT

Despite the fact that copra meal is rich in protein (up to 25%), and can meet the crude protein demands for young chicks, it is poor in quality. An experiment was carried out to determine the effect of coprase (an enzyme produced by solid state fermentation that suit to copra meal) on performance of birds fed different levels of copra meal and different enzyme treatments. A total of 108 day old unsexed Cobb were obtained from local company and randomly allocated to brooder cages. The birds were fed with starter diet from days 1 to 21 and grower diets from days 21 to 42. Feed and water were available at all times. The experimental design was a two way factorial with two basal diets (10% and 30% copra meal in the diets), three enzyme treatments (nil, 2.0% coprase produced by *Aspergillus niger* and 2.0% coprase produced by *Trichoderma* spp) and three replicate cages. Analysis of variance indicated that the inclusion of 0.05% coprase produced by *Aspergillus niger* significantly increased body weight gain of birds kept for 42 days from 1494 gram to 1686 gram. Feed conversion ratio was also significantly affected by coprase from *Aspergillus niger*. No interaction between diets and enzyme treatments was found. Among enzyme treatments, enzyme produced by *Aspergillus niger* was more effective in improving body weight gain and decreasing feed conversion ratio.

Key words: coprase, copra meal, broiler and solid state fermentation

INTRODUCTION

Problems of using copra meal in poultry diets have been well reviewed by Sundu *et al*. (2009). Despite the vast amount of previous research conducted into the improvement of the quality of copra meal, there have been few studies of the inclusion of enzymes for increasing its feeding values. Sundu *et al*. (2005) found that the inclusion of commercial enzymes did not improve growth rate of birds to the same level of the growth of birds fed corn-soy diet, particularly in the birds fed the copra meal based mash diets during the starter period. It seems likely that the enzymes used did not entirely suit copra meal as the major ingredients in the diet. This is possibly because most of enzymes available in the market were designed for soybean and wheat diets.

Attempts to improve copra meal quality through the use of specifically designed enzyme have not been reported in data base. The term "coprase" in this project refers to enzyme produced that is suitable for copra meal. Of two methods of producing enzyme, production of enzyme by solid state fermentation method has potential advantages in animal nutrition applications (Filler, 2001). Filamentous fungi such as *Aspergilus niger* is one of the best microorganisms producing enzyme in solid state fermentation method (McCleary, 1988), due to their hyphal growth, which have the capability to not only grow on the surface of the substrate particles but also penetrate through them.

This study was designed to examine the effect of enzyme "coprase" produced by *Aspergillus niger* and *Trichoderma* spp through the solid state fermentation method on birds fed high level of copra meal.

MATERIALS AND METHODS

Solid state fermentation Copra meal was used as solid substrate for fermentation. A total of 500 gram of substrate was placed in a plastic tray and moistenned with 250 ml distelled water. The medium was sterilized by steaming it for 1 hour. The substrate was then incubated with 1 gram fungi (either *Aspergillus niger or Trichoderma* spp). Those fungi were purchased from Laboratory of plant disease at Agriculture Faculty, University of Tadulako. The substrate was placed in a cabin for 5 days at room temperature for fermentation.