Feeding Fermented *Jatropha curcas L.* Meal Supplemented with Cellulase and Phytase to Kampong Chicken

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ABSTRACT

Fermented *Jatropha curcas* meal using *Rhizopus oryzae* could decrease the fat content in the meal (5.8% Vs 0.39) and eliminated trypsin inhibitor up to 67.95 %. The decreasing of fat content indicated the elimination of the main toxic substance contained in the meal, i.e. *phorbolesters.* Most of the *phorbolesters* could be extracted with the oil fraction of the *Jatropha curcas* meal. Hopefully, this treatment could destroy the toxic jatropha curcas meal to a high quality meal as poultry feed. However, the fiber and phytate content in the meal were still high. This experiment was conducted to study the effects of using fermented *Jatropha curcas* meal treated with cellulase and phytase in the kampong chicken diet as to increase the growth and decrease the mortality rate. Two hundred kampong chickens were used in this experiment and reared from day old up to 10 weeks of age. The data analyzed with a Completely Randomized Design with 5 treatment diets and 4 replications, with 10 birds in each replicate. The experimental diets were: T0 (the control diet, without *Jatropha curcas* meal), T1 (the diet contained 5% untreated *Jatropha curcas* meal), T2 (the diet contained 5% fermented *Jatropha curcas* meal + cellulase 200 ml/ton of feed), T3 (the diet contained 5% fermented *Jatropha curcas* meal + 1000 FTU phytase), and T4 (the diet contained 5% fermented *Jatropha curcas* meal + cellulase 200 ml/ton + 1000 FTU phytase). The parameters observed were feed consumption, body weight gain, final body weight, feed conversion ratio, and mortality rate. The results showed that there were no significant differences on the parameters observed due to the treatments. However, feeding untreated *Jatropha curcas* meal in the diets (T1) decreased the body weight gain approximately 10.52% and the final body weight approximately 10.13% as compared to that of the control (T0). Feeding fermented Jatropha curcas meal supplemented with cellulase + phytase(T4) yielded the final body weight and feed conversion ratio similar to those the control (T0) diet. The final body weight of the chickens fed T0, T1, T2, T3 and T4 were 955.08 g/bird, 858.33 g/bird, 872 g/bird, 935 g/bird, and 951.25 g/bird, respectively. The feed conversion ratio of the chickens fed T0, T1, T2, T3 and T4 were 2.93, 3.51, 3.49, 3.20, and 2.89, respectively. The the feed consumption per bird during 10 weeks period of experiment 2567.53 g, 2663.76 g, 2752.32 g, 2685.05g, and 2520.5 g, for chickens fed T0, T1, T2, T3 and T4 respectively. There was no mortality observed in all treatments.

Key words: fermented Jatropha curcas meal, growth, mortality, kampong chicken

INTRODUCTION

Jatropha curcas (physic nut or purging nut) is a drought-resistant shrub or tree belonging to the Family *Euphorbiaceae*, which is cultivated in Central and South America, South-East Asia, India and Africa (Schmook and Seralta-Peraza, 1997). The seeds of physic nut are a good source of oil, which can be used as a diesel substitute (Becker and Makkar, 1998). The increasing of *Jatropha curcas* cultivation as raw material of biodiesel in Indonesia leads to increase *Jatropha curcas* meal as byproduct. Besides being a source of oil, *Jatropha curcas* also provides a meal which may serve as a highly nutritious protein suplement in animal feed if the toxins and antinutrients present in the meal are removed. The meal has high trypsin inhibitor and lectin activities, which could be inactivated by heat treatment. In addition, high concentration of antimetabolic, metal-chelating and heat-stable factor, phytic acid, has been reported in *Jatropha curcas* meal (Makkar *et al*., 1998). Apart from these, phorbolesters that are present at high levels in the kernels have been identified as the main toxic agent responsible for toxicity (Makkar *et al*., 1997). Untreated *Jatropha curcas* meal was toxic to rats, mice and ruminants (Becker and Makkar, 1998) as well as to poultry (Sumiati *et al*., 2007). Feeding *Jatropha curcas* meal at the