Nutritional Properties of Three Different Origins Of Indonesian Jatropha *(Jatropha Curcas)* Meal For Ruminant

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Abstract

An experiment to explore the nutrition properties of Indonesian Jatropha curcus meal for ruminant has been conducted. Three different origins of Indonesian jatropha (Lampung, Kebumen and Lombok) have been investigated for their nutritional values such as chemical compositions, amino acid profiles, fermentability and in vitro digestibility. Anti nutritional and toxic compounds are also determined. It was found that chemical compositions and amino acid profiles of the Jatropha meal vary according to the origin of Jatropha. The jatropha meal from Lampung had the highest CP (% DM) content (42.58%) compared with jatropha meal from another region (Kebumen 37.93%, Lombok 32.94%). The CP (%Solid Non Fat) content of jatropha meal from Lampung (58.59%) was higher than CP content of soybean meal (50.71%). The jatropha meal from three different regions in Indonesia showed a significant difference ($p<0.01$) in IVDMD and IVOMD, which is the jatropha meal from Lampung (60.23%) and Kebumen (60.73%) was higher than from Lombok (49.8%). Toxic and anti-nutritianal factors that studied in this reseorch are curcin, phorbolester and phytate. The phytate and curcin level was highest in jatropha meal from Lampung. But the level of phorbolester was not detectable in this meal. The contents of toxic and anti-nutritional factors did not affect on digestibility and ruminal fermentation products.

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Introduction

Jatropha curcas L. is known as a prospective renewable energy source which to be developed in Indonesia. *Jatropha curcas* represent annual crop which hold up dryness so that able to grow and expand better in marginal land as in region of East Indonesia (Hambali, 2006).

The oil from the kernels of *Jatropha curcas* came through processing phase. Jatropha seed extraction can be conducted by using simple expeller machine. Jatropha meal is the residue from seed processing. The extraction will obtained 30-40% oil and 60% jatropha meal. The residue in the form of jatropha meal has potential as animal feed. However, due to the toxicity further research need to be conducted to have the basic information from jatropha meal.

The objective of this research were to get the basic information of jatropha meal include the information of the nutrition, anti nutrition and toxic factors which is the main constraint of *Jatropha curcas*, and to study the characteristics of jatropha meal as animal feed especially for ruminant.

Materials and Methods

Sample Preparation

The jatropha seeds used were from three different regions from Indonesia (Lampung, Kebumen and Lombok). The seed were dehulled, dried and ground manually. The kernel was defatted using manual hydraulic press machine. The defatted and ground kernel is referred to as the meal and used for next analysis. Soybean meal was used for some analysis as comparison.

Chemical Analysis

Chemical compositions of jatropha meal were determined according to AOAC (1980) procedure. The amino acids analysis was conducted using HPLC, while the gross energy was measured using Bomb Calorimeter. The concentration of phorbolester of jatropha meal was carried out by de procedures describes by Makkar *et al.* (1997), while lectin/cursin was carried out by heamagglutination assay (Aregheore *et al.* 1998). The concentration of phytate was determined using spectrophotometry procedure.