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BOOK OF ABSTRACTS

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RUMEN FERMENTABILITY AND INVITRO DIGESTIBILITY OF CORN STROW AND *Gliricidia maculata* IN THE RUMINANT DIET

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ABSTRACT The aim of this research was to determine the utilization of corn straw and *Gliricidia maculata* in the diet on rumen fermentability and invitro digestibility.. This research used randomized block design with 4 treatments and 4 replications. Ration consist of 60% forage and 40% concentrate. The treatments were ratio of corn straw and *Gliricidia maculata* T1 = 30% corn straw + 30% *G. maculata*; T2 = 40% corn straw + 20% *G. maculata*; T3 = 50% corn straw + 10% *G. maculata* ; T4 = 60% corn straw + 0% *G. maculata*. The parameters observed were rumen fermentability (pH, ammonia (NH₃) and Volatile Fatty Acids (VFA) production) and invitro digestibility (neutral detergent fiber (NDF) digestibility, acid detergent fiber (ADF) digestibility, cellulose digestibility and hemicellulose digestibility). The result showed that the ratio of corn straw and *G. maculata* had no effect ($P>0.05$) on rumen pH, VFA production, NDF digestibility, Cellulose and Hemicellulose digestibility, but treatments had significant difference ($P<0.05$) on NH₃ producton and ADF digestibility. The conclusion of this research was corn straw can be used 60% and 40% concentrate in ruminant diet without *G. maculata* with pH 6.9 VFA production 120.63 mM, the digestibility value of NDF, cellulose and hemicellulose were 52.65%; 52.10%, and 69.32% respectively. NH₃ production value was 16.95 mg/100 ml and ADF digestibility was 45.10%.

Keywords: corn straw, *Gliricidia maculata*, rumen fermentability, in-vitro digestibility

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The aim of this research was to determine the utilization of corn straw and *Gliricidia maculata* in the diet on rumen fermentability and invitro digestibility. This research used randomized block design with 4 treatments and 4 replications. Ration consist of 60% forage and 40% concentrate. The treatments were ratio of corn straw and *G. maculata* T1 = 30% corn straw + 30% *G. maculata*; T2 = 40% corn straw + 20% *G. maculata*; T3 = 50% corn straw + 10% *G. maculata*; T4 = 60% corn straw + 0% *G. maculata*. The parameters observed were rumen fermentability (pH, ammonia (NH₃) and Volatile Fatty Acids (VFA) production) and invitro digestibility (neutral detergent fiber (NDF) digestibility, acid detergent fiber (ADF) digestibility, cellulose digestibility and hemicellulose digestibility). The result showed that the ratio of corn straw and *G. maculata* had no effect ($P>0.05$) on rumen pH, VFA production, NDF digestibility, Cellulose and Hemicellulose digestibility, but treatments had significant difference ($P<0.05$) on NH₃ producton and ADF digestibility. The conclusion of this research was corn straw can be used 60% and 40% concentrate in ruminant diet without *G. maculata* with pH 6.9 VFA production 120.63 mM, the digestibility value of NDF, cellulose and hemicellulose were 52.65%; 52.10%, and 69.32% respectively. NH₃ production value was 16.95 mg/100 ml and ADF digestibility was 45.10%.

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INTRODUCTION

The problem of ruminant feed at this time is its fluctuating availability, especially in the dry season, the availability of forage is reduced; while forage is known as the main source of food for ruminants. Therefore, it is necessary to look for alternative feed sources that can replace forage during the dry season, especially those with high availability, concentrated somewhere, and have good nutritional value. The alternative feed source that meets the above criteria is corn straw and *Gliricidia maculata*.

Corn crop waste ranges from 5-6 tons of dry matter per hectare (Ruminant Directorate of Livestock Cultivation, 2006). Currently in West Sumatra very few farmers use corn straw. After the corn is taken, the corn stalk is left to dry or cut and burned. Corn straw produced from corn plants in West Sumatra Province is still not fully utilized. Corn production in West Sumatra increase with a rate of increase of 8.14% per year (Food Resilience Board West Sumatra, 2015). Corn harvested area in Indonesia in 2014 reached 3.8 million hectares (Central Bureau of Statistics, 2015). Nutrient content of sweet corn straw, especially crude protein (10.38%) and TDN (60.11%) (Ruminant Nutrition Laboratory, Faculty of Animal Science, Andalas University, 2018).

Based on its potential, both in terms of availability and nutritional content that is almost the

same as grass, the use of sweet corn straw can replace grass (Agustin & Ningrat, 2017). Utilization of sweet corn straw which has been widely known, has not been maximally utilized, whereas based on the 2017 research results (Agustin & Ningrat, 2017) sweet corn straw can be used 100% as a substitute for field grass. The use of corn straw as a source of fiber will be better if combined with protein source feed ingredients. One of the most widely available protein source feed ingredients is those derived from forage legumes, namely *Gliricidia maculata*.

G. maculata (syn. *G. sepium*) is a legume that can be used as a source of protein with a protein content 25% (Agustin, 1985), but it contains lignin higher than sweet corn straw (6.60% vs 4.36%) (Ruminant Nutrition Laboratory, Faculty of Animal Science, Andalas University, 2018). The use of *G. maculata* in the field of animal in West Sumatera is also not yet a lot of use. Feeding *G. maculata* leaves to ewes as 25 per cent of total feed led to increased voluntary feed intake. There is no benefit if the use of *G. maculata* more than 25 per cent of total feed. Its digestible energy is low. To get accurate information and data about the use of sweet corn straw and *G. maculata* leaves, especially nutritional quality and the value of ration digestibility, it is necessary to conduct a series of studies.

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