

## 学位論文の要旨

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専攻 入学年度	宮崎大学大学院農学工学総合研究科博士後期課程  資源環境科学専攻
学位論文 題目	Feeding Value of Cassava Pulp for Cattle (キャッサバデンプン粕のウシ用飼料価値)
<p><b>【論文の要旨】</b> Animal feeds generally account for up to 70 percent of the cost of production. The use of agricultural by-products as animal feed is likely to have an impact to cut down the costs. Cassava pulp is a by-product of the starch manufacturing and its use for cattle feed is now increasing. The aim of this thesis was 1) to evaluate the chemical compositions of cassava pulp samples produced throughout the year at different factories in northeast Thailand, and determined the metabolizable energy (ME) of cassava pulp for the cattle, 2) to evaluate the effects of physically effective neutral detergent fiber (peNDF) in rice straw and cassava pulp diets on the chewing activity, ruminal fermentation, milk production, and digestibility in low-producing dairy cows.</p> <p>In Chapter 2, we evaluated the chemical compositions of cassava pulp samples produced by four cassava starch factories at different locations in northeast Thailand. There were significant differences in the P (<math>0.03\% \pm 0.02\%</math>) and K (<math>0.36\% \pm 0.2\%</math>) contents of the samples from different factories (<math>p &lt; 0.05</math>). Moreover, we found interactions between factory and season in the neutral detergent fiber (<math>36.02\% \pm 8.8\%</math>) and nonfibrous carbohydrate contents (<math>59.33\% \pm 9.1\%</math>) (<math>p &lt; 0.05</math>). For the evaluation of ME, a crossover-design experiment with four cattle maintained in each of two groups was conducted. There were two dietary treatments at a maintenance level of 1.27% body weight: (1) a control diet, and (2) a cassava pulp diet, containing the control diet at 70.2% and cassava pulp at 29.8% (dry matter [DM] basis). Feeding cassava pulp did not affect energy intake, energy loss, heat production, energy utilization efficiency (except for the urine-to-gross energy ratio), methane production, fecal N, or nutrient digestibility (except for crude protein digestibility). The total digestible nutrients, digestible energy, and ME contents of cassava pulp were 74.4%, 12.9 MJ/kg DM, and 11.3 MJ/kg DM, respectively. The energy content of cassava pulp is equivalent to that of barley grain.</p> <p>In Chapter 3, eight lactating Holstein crossbred cows were randomly divided into two groups in a crossover design with two dietary treatments over two 21-day periods. The difference in peNDF contents was achieved by balancing the ratio of rice straw, cassava pulp, and concentrate. The high cassava pulp diet had 15.5% peNDF and the low cassava pulp diet had 20.2% peNDF. The results showed that feeding the low cassava pulp diet increased the concentrations of milk protein, milk fat, solids-not-fat, and total solids in the milk. In contrast, the dry matter intake, milk yield, lactose content, chewing activity, nutrient digestibility, ruminal fermentation and pH were not affected by treatments.</p> <p>Cassava pulp contains high NDF but low peNDF. Our study suggest that when large amounts of cassava pulp are included in dairy rations, the peNDF content should be considered to ensure the production of good quality milk.</p>	

- (注1) 論文博士の場合は、「専攻、入学年度」の欄には審査を受ける専攻のみを記入し、入学年度の記入は不要とする。
- (注2) フォントは和文の場合、10.5ポイントの明朝系、英文の場合12ポイントのtimes系とする。
- (注3) 学位論文題目が外国語の場合は日本語を併記すること。
- (注4) 和文又は英文とする。