

Thaintip Kraiprom 2013: Effects of Fermented by Products (FBP) as Roughage Source in Dairy Cow. Doctor of Philosophy (Animal Science), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Associate Professor Sornthep Tumwasorn, Ph.D. 157 pages.

The aims of this thesis were to study the nutritive values and fermentation characteristics of difference by product to produce fermented by-product (FBP) as roughage source for dairy cows. In Experiment I and II, FBP was composed of bagasse, vinasse, pineapple peel, corn cob and corn husk. The odor of butyric acid was not detected and showed a good quality of silage. The DM, CP, ADF, NDF, pH, lactic acid, acetic acid and butyric acid of FBP were 22.89, 7.72, 44.41, 72.61, 3.87, 4.98, 5.37 and 0.99%, respectively. The storage of FBP could be kept up to 2 months with good quality. Experiment III used 15 multiparous Holstein Friesian lactating dairy cows in mid lactation and were randomly allocated to three treatments (T1 = rice straw and 1 kg of vinasses (RS+V); T2 = sweet corn waste silage (SCWS); T3 = FBP. The completely randomized design was employed in this study and results revealed that DM intake of cow fed with rice straw and vinasses and FBP were significant higher than cows fed with SCWS ($P<0.05$). The digestibility of DM, OM, CP, NDF and ADF were significantly higher ($P<0.05$) in cows fed FBP and SCWS than cows fed with RS+V. Experiment IV studied the *in vitro* gas technique trial to investigate the effect of different proportion of FBP with rice straw on *in vitro* fermentation. The dietary treatments were ratio of FBP and rice straw (RS) were: T1 = FBP and RS as 60:40 on DM basis; T2 = FBP and RS as 50:50 on DM basis; T3 = FBP and RS as 40:60 on DM basis; T4 = rice straw only. The ration of concentrate and roughage were 60:40%. Cumulative gas production at 72 h after incubation of T2 were 60.64 ml/200 mgDM and higher ($P<0.05$) than that of T3 and T4 (53.12 and 52.96 ml/200 mg DM). Experiment V compared different proportions of FBP with RS in sixteen of 87.5% Holstein Friesian dairy heifers with an average initial body weight 246.33 ± 13.03 kg. Four treatments were: T1 = heifers fed FBP: RS at the ratio 60:40 (DM basis); T2 = heifers fed FBP: RS at the ratio 50:50 (DM basis); T3 = heifers fed FBP: RS at the ratio 40:60 (DM basis); T4 = heifers fed rice straw *ad lib*). The result from revealed that the total DM intake in T3 yielded the highest responds. The DM, OM, CP, NDF, ADF and EE digestibility were increased with increasing levels of FBP in the diets. Experiment VI studied the effects of FBP and RS on milk yield, milk composition and fatty acid profile in dairy cow. Fifteen dairy cows with 75-87.5% Holstein Friesian blood were used with an average initial body weight of 407.33 ± 53.48 kg in mid lactation and 111.25 ± 25.12 DIM. Cows were randomly allocated to 3 treatments: T1 = dairy cows fed FBP and RS at the ratio 50:50 (DM basis) *ad lib*; T2 = dairy cows fed SCWS and rice straw at the ratio 50:50 (DM basis); T3 = dairy cows fed RS *ad lib*) under completely randomized design. The result revealed that the milk yield and 4% FCM from cow in T1 was found to be the highest ($P<0.05$) and showed normal blood metabolite and rumen ecology.

Student's signature

Thesis Advisor's signature