

Nattapon Suwannasin, Acting Sub Lt. 2010: Production Efficiency and Economic Return of Crossbred Dairy Cow Fed with Partial Mixed Ration (PMR) in Dry Season. Master of Science (Agriculture), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Associate Professor Somthep Tumwasorn, Ph.D. 73 pages.

This trial used by-products from agro-industry such as bagasse, sweet corn waste and vinasses to produce partial mixed ration (PMR) for dairy cow feed. The ingredients were mixed together in the appropriate ratio and fermented under anaerobic conditions to produce PMR7%CP and PMR12%CP (anhydrous ammonia added). The physical characteristics, chemical composition as well as the effects of PMR7%CP and PMR12%CP on production efficiency and economic return of dairy cow were studied. Fifteen crossbred cows (50% Holstein Friesian 37.5% Brahman and 12.5% Native) giving the first and in mid-lactation (120 days were used). There were 3 treatments feeding concentrate (16%CP) at 6 kg/head/day and fed *ad libitum* rice straw (T1; Control group), feeding 16%CP at 4 kg/head/day concentrate and 8 kg/head/day PMR7%CP and *ad libitum* rice straw (T2), feeding 16%CP concentrate at 4 kg/head/day and 8 kg/head/day PMR12%CP and *ad libitum* rice straw (T3). The feeding level of dairy cow in each group was calculated base on the requirement for maintaining and production according to NRC (2001). Completely Randomized Design (CRD) and pair comparison were used to compare the physical characteristics and chemical composition between PMR7%CP and PMR12%CP. The results showed that PMR7%CP and PMR12%CP at 30 days of fermentation was brown brick red (unique) sour smell and without slime. The PMR7%CP and PMR12%CP had pH value (3.99 ± 0.09 and 4.60 ± 0.00) and crude protein (6.89 ± 0.50 and 11.85 ± 1.09 percentage of dry matter) was significantly difference ($P<0.01$). The dry matter (34.11 ± 2.75 , 34.60 ± 1.76 percentage), fiber composition, ash, lactic acid and acetic acid were not statistically difference ($P>0.05$), respectively. When feeding PMR7%CP and PMR12%CP as roughages source, it showed that dairy cow had total dry matter intake (12.12 ± 0.41 , 11.64 ± 0.04 and 11.95 ± 0.04 kg/head/day) and that of percent body weight (3.07 ± 0.10 , 2.77 ± 0.01 and 2.99 ± 0.01 percentage) highest in T1 ($P<0.05$). However, total dry matter intake converted into protein intake were found to be 0.93 ± 0.03 , 0.91 ± 0.08 and 1.06 ± 0.08 kg/head/day for T1, T2 and T3, respectively. The T3 had highest dry matter intake ($P<0.05$), followed by the T1 and T2 ($P>0.05$), respectively. The effects of feeding PMR7%CP and PMR12%CP revealed that T1 had lower body weight change (0.28 ± 0.07 , 0.42 ± 0.07 and 0.44 ± 0.07 kg/head/day) and lower adjust milk fat 4 percentage (6.39 ± 0.17 , 7.18 ± 0.17 and 7.38 ± 0.17 kg/head/day) than T2 and T3 ($P<0.05$) respectively. In contrast milk composition was found that T1 had higher values than those of T2 and T3 ($P<0.05$). The economical returns revealed that net income from actual milk yield in T1 was lower than those of T2 and T3 respectively. It was found that feeding PMR7%CP and PMR12%CP could improve production efficiency of dairy cow and yielded higher economic return to famers.

Student's signature

Thesis Advisor's signature