ABSTRACT

HERMON. Synchrony Index of Releasing N-Protein and Energy in the Rumen as a Basis of Ruminant Diet Formulation with Local Feedstuffs. Under direction of SURYAHADI, KOMANG G. WIRYAWAN, and SOEDARMADI H.

The experiments were conducted to prove the diet formulation technique which was based on the synchronization of releasing N-protein and energy in addition to energy and protein requirement in diet for efficiency of rumen microbial N synthesis and animal production.

Exp. 1. Nylon bag technique was adopted to determine ruminal characteristic of protein and organic matter (OM) degradation of feedstuffs (forage and concentrate diet) for which the synchrony index of N-protein and OM fermented in the rumen might be determined based on synchronization ratio of 20 (I$_{20}$), 25 (I$_{25}$), and 30 g N/kg OM (I$_{30}$) fermented in the rumen. Exp. 2. By using randomized block design, twelve local cattle were arranged into four groups according to average body weight of the animals. Each group was fed three types of diet that was different in synchronization ratio of supplying N-protein and fermented OM in rumen, namely 20 g N/kg OM (R$_{20}$); 25 g N/kg OM (R$_{25}$); and 30 g N/kg MO (R$_{30}$). The diets had iso-energy and iso-protein contents and had the same synchrony index. Exp. 3. By using randomized block design with a factorial of 3 x 2. The first factor was three different protein levels i.e. 10, 12, and 14%; the second factor was two different levels of TDN (total digestible nutrients) (65 and 70 %). Eighteen local cattle were arranged into three groups according to average body weight of the animals. Each group was fed six types of diet that was different in level of CP or TDN. The diets had the same synchrony index, namely 0.560.

The results of exp. 1; Feedstuff of grass and concentrate of energy sources had high synchrony index in I$_{20}$ whereas legumes and concentrate of protein sources had high synchrony index in I$_{30}$. Exp. 2 showed that the type of diet had no effect (P>0.05) on intake and digestibility of nutrients, N retention, average daily gain (ADG), and feed efficiency. But R$_{20}$ had higher allantoin concentration in the urine than that of R$_{25}$ and R$_{30}$ (P<0.01). Exp. 3 showed that except the crude fat digestion, there was no interaction between protein and energy on the other parameters (P>0.05). Compared to diet with 70% TDN, diet with 65% TDN produced higher rumen microbial N, consumption and digestion of nutrients, and N retention (P<0.05). Diet with protein level of 12% tend to have better allantoin concentration in the urine, consumption and digestion of nutrients, N retention and blood urea nitrogen (BUN) than that of either 10% or 14%. It can be concluded that the diet having 65% TDN and 12% protein with synchrony index of 0.560 in the synchronization ratio of 20 g N/kg OM fermented in the rumen will generate more efficient N synthesis of rumen microbes and average daily gain of local cattle.

Keywords: synchrony index, degradation, N retention, intake of nutrients, digestibility of nutrients