Energy utilization models of cattle grazing in oil palm plantations I. development of models

ABSTRACT

Energy obtained by grazing cattle in oil palm plantations is usually used for maintenance of body functions, the construction of body tissues and pregnancy, the synthesis of milk and the conversion to mechanical energy used for activities such as walking, eating and others. In this study, attempt was made to estimate metabolizable energy (ME) requirement of grazing cattle. Models of ME requirement (MER) for maintenance, gain, pregnancy, lactation and activities were developed. ME system and units were used because of wide recognition. Estimation of ME intake in grazing cattle was expressed as MEVI = 14.58 X VI X DMD, and under grazing condition MEVI = MERi. MER was expressed as a function of net energy (NER, MJ) required for the iô th body function. Coefficient of efficiency for conversion of ME into net energy (ki) was adopted from literatures. Quantifying of ME requirement for Kedah-Kelantan cattle under grazing condition was made by using equation MERM = NEM / kn. The estimated values of MER for Kedah-Kelantan cattle is quite reasonable if compared with other estimates as reported in literatures from stall-fed animals. Dynamic MER models for grazing herd was developed in order to estimate ME requirement for maintenance and productions. These ME requirement models can be used for prediction of energy utilization pattern of the herd in the grazing systems.

Keyword: Metabolizable energy; Models; Grazing cattle; Oil palm plantations