CHAPTER VI
GENERAL CONCLUSION

This thesis work presents three experiments to determine the metabolizable energy requirement for maintenance and growth of growing Thai native cattle by using comparative slaughter technique and using indirect animal calorimetry , the study of the effects of metabolizable energy intake on growth performance, nutrients digestibility, rumen fermentation, blood metabolites and carcass characteristics also, and evaluation of the metabolizable energy requirement for maintenance of Thai native cattle based on recovered energy and daily weight gain by using a meta-analysis.

Experiment 1, The results indicated that metabolizable energy requirement for maintenance of yearling Thai native cattle is 390.61 KJ/kgBW$^{0.75}$/d from long-term feeding trial method and 485.47 KJ/kgEBW$^{0.75}$/d from balance trial of comparative slaughter technique. Metabolizable energy requirement for growth 1 g/kg BW$^{0.75}$/d is 35.42 KJ/kgBW$^{0.75}$/d. Positive linear effects were found for feed intake, average daily gain and energy retention as the metabolizable energy intake increased. Metabolizable energy intake tended to increased linearly in all groups, as a result of higher dry matter intakes. All nutrient intakes increased linearly with increasing metabolizable energy intake. All nutrients digestibility were not influenced by metabolizable energy intake. The pH, ammonia nitrogen concentration and volatile fatty acid of rumen fluid and blood metabolites, such as urea nitrogen and glucose were not different across all treatments. The carcass traits, such as carcass quantity, wholesale cuts, Thai style cutting, consumer acceptablility and fatty acid profile were not different in all treatment groups. The results from this current study were lower than many reports and recommendation by WTSR of Thailand. However, our findings support the hypothesis by NRC that *Bos indicus* might have lesser maintenance requirement than *Bos taurus*.

Experiment 2, Feed intake and nutrient intake were increased with increasing energy intake. The digestibility of all nutrients excluding neutral detergent fiber was not affected by the difference of energy intake. Energy loss and heat production were increased with increasing energy intake. The analysis of intercepts results in a common

requirement for net energy for maintenence of 283.11 KJ/kgBW$^{0.75}$/d, and the efficiency of metabolizable energy for maintenence of 0.53. Metabolizable energy requirement for maintenance was determined to be 531.76 KJ/kgBW$^{0.75}$/d.

Experiment 3, Data analysis by using a meta-analysis indicated that in balance trial, the metabolizable energy requirement for maintenance of Thai native cattle are 527.47 KJ/kgBW$^{0.75}$/d for bull, 370.95 KJ/kgBW$^{0.75}$/d for steer and 450.71 KJ/kgBW$^{0.75}$/d for pool data. The efficiency of metabolizable energy for maintenance was 44% for bull, 60% for steer and 63% for pool data, respectively. In long-term feeding trial, the metabolizable energy requirement for maintenance of Thai native cattle are 544.09 KJ/kgBW$^{0.75}$/d for bull, 479.19 KJ/kgBW$^{0.75}$/d for steer and 488.81 KJ/kgBW$^{0.75}$/d for pool data.

In conclusion, the results from this thesis are ranged from 390.61-488.81 KJ/kgBW$^{0.75}$/d. This finding indicated that the metabolizable energy for maintenance of Thai native cattle is less than beef cattle in temperate zone approximately 7-9 %. (compared with reported by NRC (1976) (540 KJ/kgBW$^{0.75}$/d) and ARC (1980) (527 KJ/kgBW$^{0.75}$/d). The summary from this current study are demonstrate that increased energy intake level can improve energetic efficiency and tend to decreased energy loss, which involving to animal feed resources can be used with greatest effectiveness.

The connotation of this study is suggested that energy requirements derived in the present study can be used as guidelines. However, the equation recommended was developed from a small database and this has caused high variation. More feeding trials and balance trials are needed to better define energy requirement for beef cattle.