CHAPTER 4

CONCLUSIONS

Chicken meat quality of Thai indigenous chicken within age range 16-20 weeks obtained from the intensive rearing system and extensive rearing system was different only in fat and ash content. Chicken muscle from the intensive rearing system had higher fat and ash content and color of muscle was darker and lower in yellow color. Muscle protein especially myosin of chicken reared under intensive system was more heat resistance. Microstructure of muscle fiber was not different between rearing systems. The effect of age was more significance on chemical compositions and chicken meat texture than the rearing system. The protein and fat content increased while moisture content decreased when chicken age increased. Chicken muscles aged 18 weeks had the highest shear value in concomitant with more compact fiber arrangement among chicken ages 16 and 20 weeks.

Meat obtained from different chicken breeds, which consumed at different ages had difference in chemical compositions leading to difference in properties of their meat. In raw muscles, breast and thigh muscles of spent hen has were the most toughness compared to Thai indigenous and broiler chicken muscles. This probably due to spent hen muscles had higher collagen content with less soluble and had bigger muscle fiber diameter with more compacts and tightly arrangement of myofillaments. Spent hen muscles had lower denaturation temperature of protein myosin and collagen leading to higher in cooking loss compared to Thai indigenous chicken and broiler muscles. Heating all breeds chicken muscles in Tom Yum soup could reduce shear values of *biceps femoris* muscle but had less influence on *pectoralis major* muscle. The decrease in shear value was related to heating in Tom Yum soup could increase heat soluble collagen of muscles 78% for broiler, 70% for Thai indigenous chicken and 44% for spent hen. Shear values of cooked spent hen and indigenous chicken muscles were not different and much higher than broiler muscles. Thermal process at high temperature (121°C) caused lighter and more yellowness in Tom Yum *pectoralis major* spent hen muscle compared to lower temperature (116°C) at F-value. Thermal process at lower temperature (116°C) increased more soluble collagen of spent hen muscle than the higher temperature (121°C). However, no significant difference in sensory evaluation between Tom Yum spent hen muscles processed with high and low thermal temperatures was obtained. Thermal processed Tom Yum spent *pectoralis major* and *biceps femoris* muscles could be stored for 6 months at room temperature without change in sensory characteristics. The weight loss of Tom Yum spent hen muscles would be stable after 2 months of storage. The maximum weight loss of 45-50% of precooked weight before process was observed. The fiber diameter of Tom Yum spent hen muscle was expanded within 2 months of storage. The color of Tom Yum spent hen muscles became brownish during storage might be due to the absorption of red oil color from Tom Yum ingredients.

Thai indigenous chicken muscle both raw and cooked in Tom Yum soup had similar shear force, cooking loss and total collagen compared to spent hen muscles. However, the results from DSC showed that muscle proteins of Thai indigenous chicken was higher in heat resistant while its collagen property was more heat soluble. This may result to more tender texture in Thai indigenous chicken muscle after thermal process in Tom Yum soup. Therefore, chicken meat from spent hen and Thai indigenous chicken aged more than 18 weeks especially thigh muscle might be used as alternative materials for thermal process Tom Yum soup chicken meat product.