CHAPTER V

CONCLUSION AND RECOMMENDATIONS

Meat quality is an important aspect of the meat industry because of consumers' acceptability and satisfaction. Consumers' acceptability of meat product is dependent on the tenderness of such product and tenderness is known to vary in meat products. Meat tenderness is a complex quality trait attributes in breeding programs, therefore selection programs for genetic improvement have become a powerful method for identifying animals with the desired tenderness and the selection process can be done on young animals even before birth.

This study deals with the investigation of G3535A, C7198A, and G9950A SNPs in the CAPN1 gene, a gene with great potential importance for meat tenderness. These three SNPs were discovered from twenty breast meat samples to establish the potential association with the variation in meat tenderness between native and broiler chickens. The tenderness phenotypes for all chickens' meat samples were determined by Warner-Bratzler shear force. Water-holding capacity (WHC) was also measured as thawing and cooking loss. The results confirm previous results that the percentage of thaw loss and shear force values are significantly ($P<0.05$) higher in native chickens than in broilers. However, there were no significant differences ($P>0.05$) between the percentages of cook loss in both chicken types.

For analyzing the polymorphisms at the three loci SNPs in CAPN1 gene, the sequences of nucleotides have been detected using PCR and sequencing techniques.

These genotyping data were then used to perform the association aimed at finding potential correlations between SNPs and meat tenderness. It was found that there were no significant differences in allelic frequencies between native and broiler chicken samples (P>0.05). Furthermore, allele frequencies differ significantly from those documented in other populations studied to date. Thus, the markers G3535A, G9950A, and C7198A SNPs in the CAPN1 gene were unable to explain the variations in meat tenderness traits in selected Malaysian chicken populations.

It will be interesting to further investigate the differences in meat tenderness between the two groups, and how that can be related to genetic variation. A much larger sample size as well as an active pureline selection of animals should be considered to increase the chance of differentiated genotypic groups. Besides, much attention should be taken to survey other gene–environmental factors through additional measurements with the aim of discovering quantitative genotypic trait involved in meat quality. This will be a step forward in the regard of implementation of breeding programs.

The Novel Findings in This Thesis are:

- This study is the first survey to provide information on SNP markers and their frequency in the CAPN1 gene belonging to Malaysian chickens breeds.
- The identification of SNPs is reported and the polymorphism information content of the CAPN1 gene markers is critically discussed.
- Basic PCR techniques for the assessment of SNPs in the CAPN1 gene along with the availability of preliminary data on SNPs can be useful to plan experiments aimed at testing associations with meat tenderness. However, additional animals and phenotypic measurements are required in order to verify genetic correlations.