CHAPTER 4

CONCLUSION

1. Addition of NaCl up to 3.5% increased breaking force and deformation of Pacific white shrimp gel with the coincidental decreases in expressible moisture content. The addition of NaCl resulted in the fine fibrous network which was likely associated with the improved textural properties of Pacific white shrimp gels. Furthermore, the use of PP in combination with $MgCl_2$ at the appropriate levels could improve the gel-forming ability of Pacific white shrimp gels.

2. EW, WPC and BPP at appropriate level effectively enhanced Pacific white shrimp gel strength. An excessive amount of protein additives generally caused the decrease in gel strength. Although BPP at a level of 0.5% (w/w) showed the highest inhibitory activity toward autolysis of Pacific white shrimp gel, it had the adverse effect on color of gel.

3. Autolysis of Pacific white shrimp meat was enhanced in the temperature range of 35-40°C, which was commonly used as setting temperature for fish mince or surimi. At physiological pH, serine proteinase was a major contributor to protein degradation. However, proteinases in Pacific white shrimp meat could be partially inhibited by protein additives. WPC and BPP at levels of 2-3% showed the highest inhibition towards autolysis. Thus, setting the shrimp meat paste at high temperature (40°C) commonly used for fish mince or surimi should be avoided and the use of selected proteinase inhibitor should be implemented.

4. The optimal temperature of Pacific white shrimp muscle TGase was 55°C. This enzyme was activated by Ca^{2+} (20 mM). Endogenous TGase induced the formation of non-disulfide covalent bond in Pacific white shrimp gel. Setting mediated by endogenous TGase at the appropriate temperature and time contributed to an enhanced gel properties of Pacific white

shrimp meat. Setting of Pacific white shrimp sol could be conducted at 55°C, corresponding to the optimum temperature of endogenous TGase activity and lowered autolytic activity.

5. The use of MTGase in combination with setting at 55°C could improve gel forming ability of Pacific white shrimp gel effectively, especially with increasing MTGase levels. The optimal MTGase level was 0.3%.

6. The addition of modified starch and *ι*-carrageenan at 2% could maintain the textural property and decreased the expressible moisture of Pacific white shrimp gel subjected to multiple freeze-thawing effectively. The addition of modified starch yielded the gel with the fine structure having smaller voids network after freeze-thawing.

FUTURE RESEARCHES

1. Gelling characteristics of individual myofibrillar protein should be conduct
2. Increase in dissociation of actomyosin complexes via the destruction of Z-disk proteins should be carried out.
3. Effect of different types of hydrocolloids on gelling ability of Pacific white shrimp meat should be further studied.