CHAPTER 5
CONCLUSION

Result from this study could be concluded as followed:

1. The appropriate formula of yoghurt which used in the experiment was, cow milk and goat milk at a ratio 1:2 (26.85% : 53.70%), 8.06% (w/w) skimmed milk, 8.06% sugar, 0.08% caragenan, 1.61% yoghurt starter culture (*L. bulgaricus* and *S. thermophilus*) and 1.61% probiotic bacteria (*L. acidophilus* and *B. bifidum*).

2. Different hi-maize starch concentrations were found to significantly affect the amount of *L. acidophilus* and *B. bifidum* cells that were entrapped in the sodium alginate-hi-maize starch beads. Increasing the hi–maize starch concentrations to the alginate resulted in an increase in the numbers of *L. acidophilus* and *B. bifidum* cells. The survival rate of probiotic depended on the concentration of hi-maize starch. As higher levels of hi-maize starch were used, the survival rate of probiotic was increased as well.

3. The time of incorporation of probiotic in the yoghurt affected the survival number of probiotic with statistical significance. The yoghurt which was fermented with yoghurt culture until the pH value became 4.5 and then added with encapsulated probiotic had higher number of the survival number of probiotic than the yoghurt which was fermented with both probiotic and yoghurt culture at the same time. The survival amount of *L. acidophilus* at all starting concentration levels was high.

4. The survival of yoghurt starter culture and probiotic bacteria at various times after freeze drying and spray drying were different. In general, freeze drying resulted in a higher survival percentage of all microorganisms than spray drying. Freeze drying had a less deleterious effect on the viability of probiotic bacteria than spray drying. During spray drying, lethal thermal injury is the main reason for reduced cell viability.

5. The number of yoghurt starter culture and probiotic decreased in both the laminated plastic pouch and aluminium foil but the decrease level in the aluminium

foil was lower than the laminated plastic pouch. Since the circulation rate of air in aluminium foil is very low, it is appropriate to be used as a container for products with probiotic and the amount of survival of probiotic was higher.

6. The levels of IgA increased significantly during intake of the probiotic formula in healthy adolescents. IgA levels during intake were significantly higher than those before intake. This suggests that ingestion of the formula containing *L. acidophilus* and *B. bifidum* stimulated the production of IgA.

Recommendations for further research

1. Future studies about probiotic microencapslation need to be carried out in order to monitor the effect of microencapsulation on bacteria in the gut using in vivo and in vitro studies.

2. The effects of bead size and different microencapsulation methods on the survival of probiotic in yoghurt powder need to have a further study.

3. The next research should study about feeding trial of probiotic added goat and cow milk yoghurt in various population groups to evaluate the influence of the formula on the induction of IgA.

4. The effect of feeding trial of probiotic added goat and cow milk yoghurt on another immunity parameter such as phagocytic activity of neutrophils, monocytes and natural killer cell activity should be studied for a deeper understanding of probiotic action on the host immune system.