

CHAPTER 5 CONCLUSION AND SUGGESTIONS

5.1 Conclusion

Anti-chicken coccidia IgY was detected in pooled fresh yolk at titer of 2560 at week 6 after first immunization. Level of the IgY detected in 200 immunized chicken eggs from week 13 and 14 after first immunization presented by OD at 450 nm was found to vary from approximately 0.35 to 2.86 while the OD₄₅₀ of negative control was 0.68. Immunofluorescence assay demonstrated that the IgY produced in this work at dilution 320 bound specifically and exclusively to coccidia cells at sporulated stage. In addition, the IgY produced bound to all components of extracted sporulated oocysts which consist of sporozoites, sporocysts, oocysts and other coccidia cell debris.

Anti-chicken coccidia IgY production period of the 855 immunized hens was found to be approximately 14 weeks, from week 6 to week 19 after first immunization. The majority of the immunized hens (76%) produced moderate amount of the anti-chicken coccidia IgY whilst 14 % of the hens produced high amount of the IgY and 10% of the hens was found negative. For productivity of the dried IgY product, total volume of yolks separated from immunized chicken eggs each week varied from around 30-38 kg and yield of the dried IgY product varied from 10-20 kg which was less than the expected yield indicating the loss of approximately 27-50% of the dried IgY product each week. The anti-chicken coccidia IgY titer of the dried product remained constant at 2560 for eight weeks during the production period, from week 12 until week 19 after first immunization. There was no significant adverse effect on activity of the IgY produced after spray dry processing at 140°C for an air inlet temperature and 72°C for an air outlet temperature as suggested by Kakohki and Kanagawa (1991).

Dried IgY product was characterized in order to evaluate its possibility to be used for animal feed supplement in various routes. It was found that dried IgY product was of smaller particle size than 200 microns which is suitable to be used in water suspension form in chicken drinking water. In addition, Tween 80 could be employed to delay sedimentation of the dried IgY product suspended in tap water for around 2 hours. From food safety point of view, although some pathogenic bacteria were found in fresh yolk separated from immunized chicken eggs, significantly removed could be achieved by

spray drying process. Shelf life of the dried IgY product stored at 4°C was of at least 16 months while the dried IgY product stored at 30°C was around 12-13 months.

In summary, the immunized chickens in this study could efficiently produce eggs containing anti-chicken coccidia IgY for approximately 14 weeks with the yield of 10-20 kg of the dried IgY product each week. Characterization of the dried IgY product for animal feed supplement purpose demonstrated that the dried anti-chicken coccidia IgY product may be used as an alternative strategy to control chicken coccidiosis by adding this dried IgY product in chicken feed or drinking water.

5.2 Suggestions

Since the number of eggs laid by immunized hens each week was less than ideal number, the factors influencing egg laying capability such as chicken strain, age and health status of chickens should be considered. For the loss of the dried IgY product after spray drying, the protocol for operation and harvest of the product during spray drying process should be improved. Ignario and Lannes (2007) suggest that diluting the egg yolk with distilled water (between 25 to 50 %w/w) prior to spray drying results in greater yield. Another method, fluid bed drying may be applied. Since this method is designed to reduce the moisture content remained in the final powder. For controlling of microbial contamination during egg washing, the temperature of washwater should be higher than that of the eggs at least ten degrees. In addition, some sanitizers such as chlorine, iodine and quaternary ammonium compound may also be employed to kill microbes including pathogens (Baker and Bruce, 1994). Further, to ensure that the dried IgY product in suspension maintained its activity during feeding to chickens, IgY activity in the suspension should be determined intermittently at appropriate time interval. Finally, the dried IgY product should be tested for animal trial before used.

