CHAPTER 5

CONCLUSIONS

5.1 CHAPTER 2

1. The study population represented approximately 31% of *Salmonella* prevalence from 805 samples in six pig farms in upper-northern, Thailand.
2. The highest prevalence of *Salmonella* spp. contamination was found in flies (45%), followed by worker's boot swabs (42%) and pig feces (35%) in six pig farms in upper-northern, Thailand.
3. Feces and pen floor swabs were detected in the highest numbers of *Salmonella* contamination in the *Salmonella*-positive samples (1.07 logMPN/cm^3 and 1.58 logMPN/cm^2, respectively) in six pig farms in upper-northern, Thailand.
4. The study population represented approximately 19 % of *Salmonella* prevalence from 1,845 samples in three pig slaughterhouses in upper-northern, Thailand.
5. The highest prevalence of *Salmonella* spp. contamination was found in pig mesenteric lymph nodes (61%), followed by pig feces (56%) and lairage floor swabs (39%) in three pig slaughterhouses in upper-northern, Thailand.
6. Feces and cutting block swabs were detected in the highest numbers of *Salmonella* contamination in the *Salmonella*-positive samples (1.46 logMPN/cm^3 and 0.47 logMPN/cm^2, respectively) in three pig slaughterhouses in upper-northern, Thailand.
7. Fisher's and Kruskal-Wallis test demonstrated the highly significant difference of *Salmonella* detected in pig feces from slaughtering level than farm level ($p<0.01$).
8. Kruskal-Wallis test demonstrated the highly significant difference of *Salmonella* detected in floor swabs as well as worker's hand swabs from farm level than slaughtering level.

9. No statistical difference detected from Fisher's test of *Salmonella* prevalence demonstrated between floor swabs from each production level, as well as worker's hands swabs from each production level.

5.2 CHAPTER 3

1. The overall *Salmonella* prevalence and contamination levels mean from pig skin and carcass swabs samples in three pig slaughterhouses in upper-northern, Thailand was to be 11.85% and 0.34 MPN/cm^2, respectively.
2. *Salmonella* prevalence for each slaughterhouse, A, B and C, were 8.51%, 23.91% and 3.40%, respectively.
3. *Salmonella* contamination levels for each of the slaughterhouses, A, B and C, were 0.08, 0.80 and 0.14 MPN/cm^2, respectively.
4. The highest *Salmonella* prevalence of *Salmonella* spp. contamination was found at the cutting and dressing step followed by the scalding step, both at slaughterhouse B.
5. The highest *Salmonella* contamination level was found at the scalding step followed by the evisceration step, also from slaughterhouse B.
6. There was no statistically significant in *Salmonella* spp. prevalence and contamination levels detected with different patterns at the slaughterhouses which were supplied pigs from either co-operative or integrated farms.
7. Regular changing of water in the scalding tank after each batch and the use of chlorine in the washing step considered as factors to reduce *Salmonella* spp. loads on carcasses.
8. Risk of *Salmonella* spp. Contamination of pork products at the final stage of slaughtering was nearly 10%.

5.3 CHAPTER 4

1. Five majority serotypes of *Salmonella* stains strains recovered from farm and slaughtering level in upper-northern, Thailand was *S*.Rissen, *S*.I. 4,5,12:i:-, *S*. Stanley, *S*. Typhimurium and *S*. Weltevreden.

2. Resistance to tetracycline was the most prevalent (83%) followed by ampicillin (81 %) and streptomycin (64%) from 86 selected of 5 majority serotypes of *Salmonella* strains recovered from farm and slaughtering level in upper-northern, Thailand.
3. Resistance to amoxicillin-clavulanic acid, ciprofloxacin and norfloxacin was not observed in any of the *Salmonella* tested strains.
4. Resistance to the antimicrobial agents ampicillin, sulfa-trimethoprim, chloramphenicol and streptomycin were greater in samples obtained from Lamphun than in samples from Chiang Mai.
5. Resistance to the antimicrobial agents ampicillin, sulfa-trimethoprim, chloramphenicol, streptomycin, nalidixic acid, cefotaxime and tetracycline were greater in samples obtained from pig farms than slaughterhouses.
6. Discriminatory power of serotyping and PFGE by Simpson's diversity index was 0.73 and 0.92, respectively.
7. Associations among the *Salmonella* strains recovered from various locations and at difference sampling times as well as evidence of the existence in some areas of persistent strains were revealed by PFGE.