

CHAPTER 5 DISCUSSION

This study is based on data from a single swine farm in the northern part of Thailand, which was confirmed as infected with PRRS virus and *A. pleuropneumoniae*, during March 2004 through October 2006. The PRRS virus eradication method in this study included a closed-herd system with a strict biosecurity system, an aerial disinfection program, and good health management. These intervention strategies increased the cost of production. However, the benefits were enough to cover the investment. In addition, a herd which is free of the PRRS virus has significantly more production income than positive clinical and sub-clinical herds[35].

The results showed that the estimated seroprevalence of PRRS at the end of the study (23.33%) was reduced significantly ($p<0.05$) from the initiation of the study (65%). Also, the virus was not found from culling sows by PCR testing in the final year.

In a previous field study, a very low prevalence of persistently infected sows was found following a prolonged herd closure strategy[5] [36]. These results were supported by another study in which experimentally infected animals were eventually able to eliminate the viral infection after developing protective immune response.

Furthermore, these results indicated that the seromonitoring of individual gilts and a disinfection program are effective in decreasing the recirculation of PRRS virus within the breeding herd, allowing continuous reintroduction of non-infected gilts into the herd.

As shown by several authors, a PRRS-negative population can be produced from PRRS-positive sources by managing the gilt pool [20, 37]. In contrast, the seropositive breeding herds raising their own replacement gilts significantly increased the risk of a herd being PRRS seropositive[38, 39] because an unstable serological profile of a breeding herd can transfer the virus from transplacental transmission or shedding in milk[40-42].

This study also provides new information on the use of PRRS IDEXX ELISA across individual testing in gilt overtime during the gilt acclimatization period because disease circulation usually occurs in farrowing rooms, especially from gilts[42]. However, the previous researcher commented that PRRS IDEXX ELISA is a good indicator of the PRRS status of a herd, but the possibility of false positives makes this test unreliable as the sole determinant of the PRRS virus status of individual animals[5].

In the current study, the farm received non-infected piglets in 2005. These results indicate that the methods used in this study can control viral shedding in farrowing pigs. Then, pigs were reared with a two-site system and an all-in/all-out

system. Finally, the herd could produce negative finishing pigs as in the previous study [43].

Based on these results, it can be suggested that basic management techniques such as cleaning, disinfecting, and drying buildings and equipment are of paramount importance in disease control. Cleaning removes organic matter that can prevent many disinfectants from functioning as designed. Disinfecting reduces or eliminates biocontamination of the unit, decreasing the load of bacteria and viruses that build up over time. Drying is important because desiccation kills many organisms. Various studies have suggested many possible explanations for the variability in the impact of PRRSV on herds, such as the effects of housing and stocking density on the probability of transmission by nose to nose contact and aerosol transmission, the use of disinfectants and other cleaning protocols, and the use of certain biosecurity practices in a herd [44, 45].

In this study, the medical elimination techniques and the vaccination program were unable to eradicate APP in the breeding herd as clearly as in previous studies [32, 46-48]. Chronically infected pigs may also harbor *A. pleuropneumoniae* in tonsillar crypts [29]. Therefore, the antibiotics could not completely eliminate the bacteria from the pig. In addition, the use of APP subunit vaccine can protect against clinical disease and prevent the occurrence of carrier pigs as discussed by others [49]. For this reason, it decreased shedding among sows to piglets within the farrowing house. Therefore, the breeding stock can produce non-infected APP pigs with high maternal immunity [50]. Furthermore, maternal antibodies may interfere with the response to subunit *A pleuropneumoniae* vaccines. Thus, it is important to develop farm specific vaccination programs, based on individual farm diagnostic data, rather than promoting standardized protocol.

In the year 2006, this herd produced weaning pigs that were free from APP infection with prolong maternal immunity, as shown in the 40% seroprevalence of 4- to 8-week-old pigs (Fig. 4.3). It might be that the good immune status of healthy sows causes longer-lasting maternally-derived immunity in their offspring [49] with no vertical transmission.

This report describes a protocol that was successful in producing PRRS virus and APP infection negative finishing pigs from a PRRS virus positive source. By using a closed-herd system with management techniques, the likelihood of producing negative pigs was increased and assured over time. This study agrees with Gillespie and Carroll (2003) that elimination programs for PRRSV must be designed specifically and flexibly for each facility and production unit, strain virulence, and the farm's goal. However, this protocol can be validated in all small size production (< 700 sows) sites which are far from other positive farms.

In conclusion, the way to eradicate PRRS virus with bacterial co-infection is to improve the population's immune status by concentration on basic management, biosecurity strictness, and source of replacement gilts. In addition, by knowing the types of bacteria that persist in their herds, swine producers can employ appropriate medication elimination techniques.