CHAPTER 4
RESULTS

4.1 Detection antibody against PRRS virus and APP

PRRS seroprevalence in breeding sows and pigs is presented in Table 4.1, Figure. 4.1 and Figure. 4.2. Throughout three years of monitoring the herd, the mean S/P ratio with standard error of PRRS in the breeding herd gradually decreased from 1.81±0.14 to 0.62±0.30, to 0.63±0.14, and to 0.28±0.09. The PRRS seroprevalence of breeding sows progressively decreased correspondingly as shown in Table 4.1. The percentage of PRRS seropositive sows was high (76.67%) in the year before the intervention. After that, it gradually decreased to 23.33% in 2006 (Figure. 4.1). In addition, the 2nd to 6th parities with high level of PRRS antibody titers at the beginning (Figure. 4,2 A) had lower PRRS antibody titers (S/P ratio < 1.0) from the following year through 2006.

PRRS seroprevalence of finishing pigs was 42% at the beginning. Then, it declined to non-prevalence in 2006. A PRRS-seronegative finishing pig population (100%) was established after 18 months of the intervention. In addition, the pigs; PRRS antibody titers in 2004 were lower than 0.4 due to the decline of maternal antibodies from 8 weeks of age until market age (Figure. 4.2 B). After that, the pigs' S/P ratio in 2005 was lower than 0.4 at weaning age.

The estimated seroprevalence of APP was not significantly different before (sows 95%, pigs 38.33%) and after (sows 98.33%, pigs 40%) the study (Table 4.1). However, the antibody response of sows at parity 3 or greater in 2003 had a higher level than in the following years (Figure 4.4 A). In addition, seronegative pigs were found at 10 weeks of age after the decline in maternal passive immunity in 2006 (Figure 4.3). In fact, the results showed that this herd did not have natural infection in the finishing population.

Table 4.1 Seroprevalence (%) of PRRS and APP in sows and finishing pigs as determined by ELISA test during the years 2003 to 2006

Study year	PRRS		APP	
	Sows	Finishing pigs	Sows	Finishing pigs
2003 (**before study**)	76.67 [a] (46/60)	42.00 [a] (21/50)	95.00 (57/60)	38.33 (23/50)
2004	65 (39/60)	26.00 (13/50)	93.33 (56/60)	28.33 (17/60)
2005	51.67 (31/60)	4.00 (2/50)	91.67 (55/60)	35.00 (21/60)
2006	23.33 [b] (14/60)	0.00 [b] (0/50)	98.33 (59/60)	40.00 (24/60)

[a,b] Values with different superscripts within a column are significantly different (P< 0.05)

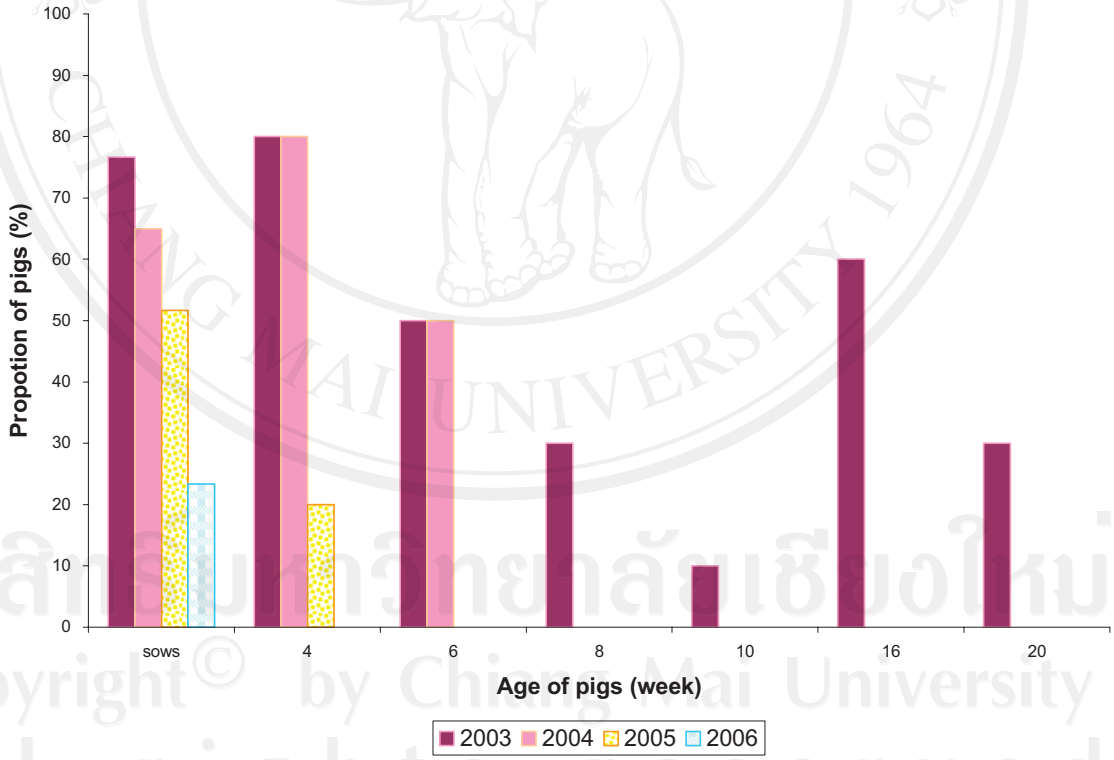


Figure 4.1: Proportion of pigs with PRRS serological results from ELISA at different ages of herd from years 2003 through 2006

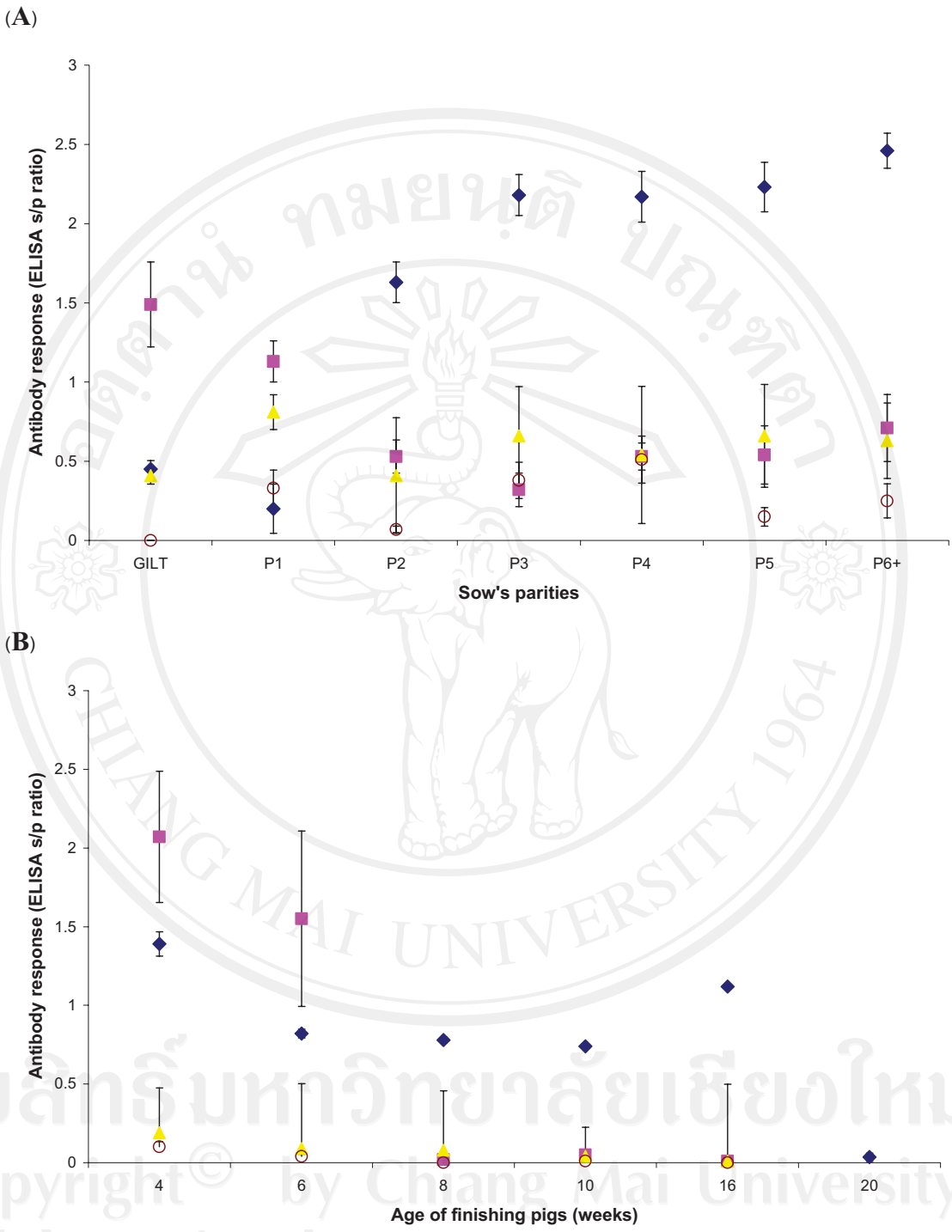


Figure 4.2: Antibody response to PRRS virus infection. Values represent means and standard errors of ELISA s/p ratios in years 2003 (◆), 2004 (■), 2005 (▲) and 2006(◯): (A) breeding sows, (B) finishing pigs

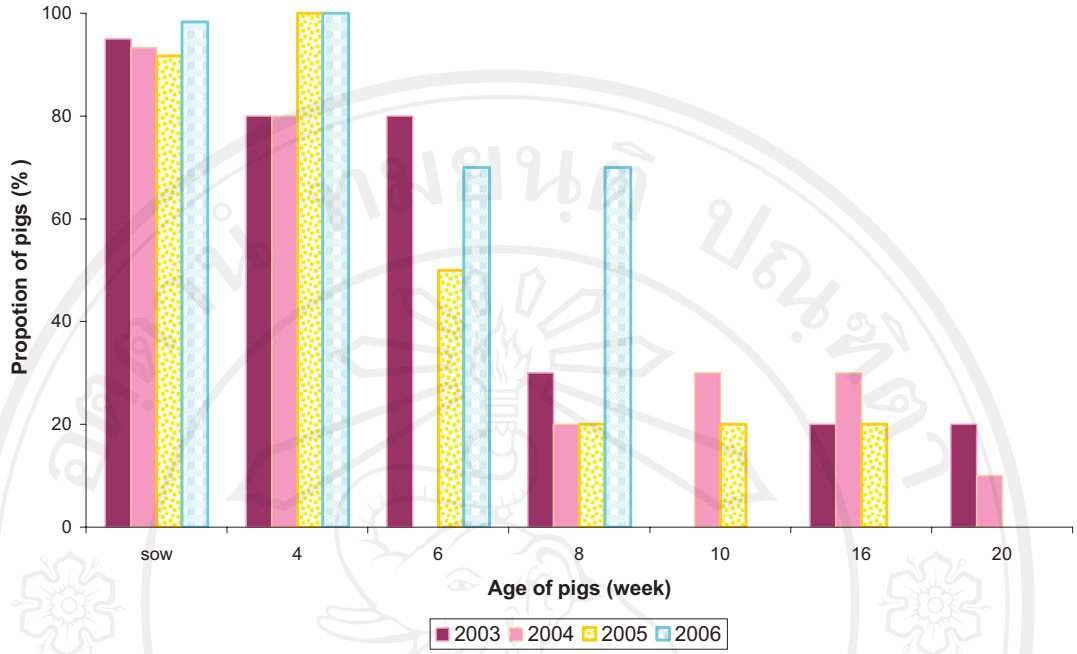
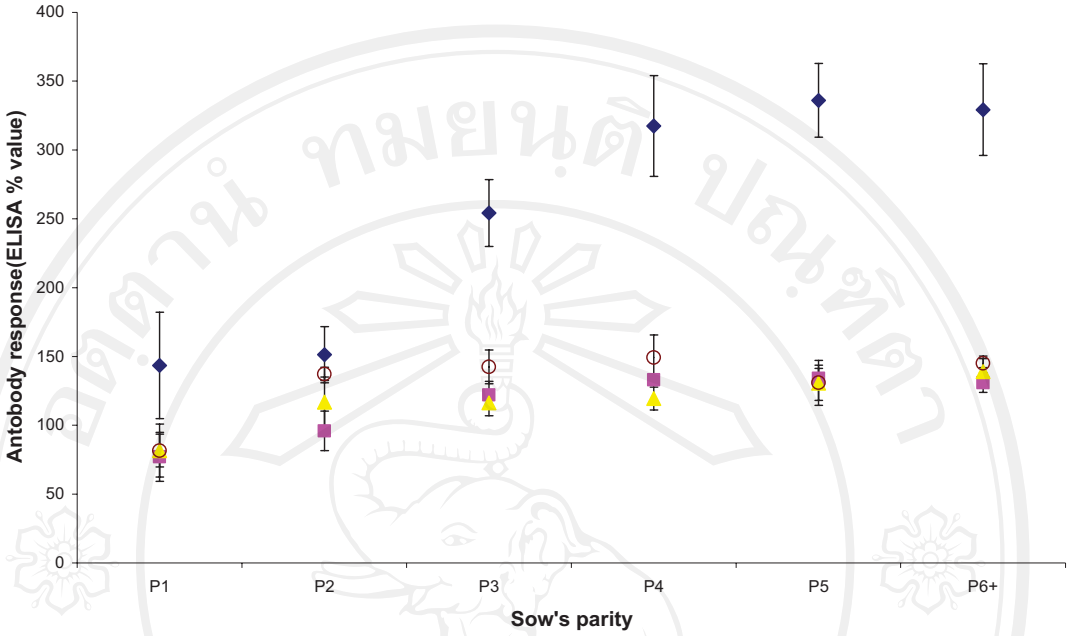


Figure 4.3: Proportion of pigs and means of % value of APP serological results from ELISA at difference ages of herd in years 2003 through 2006

(A)



(B)

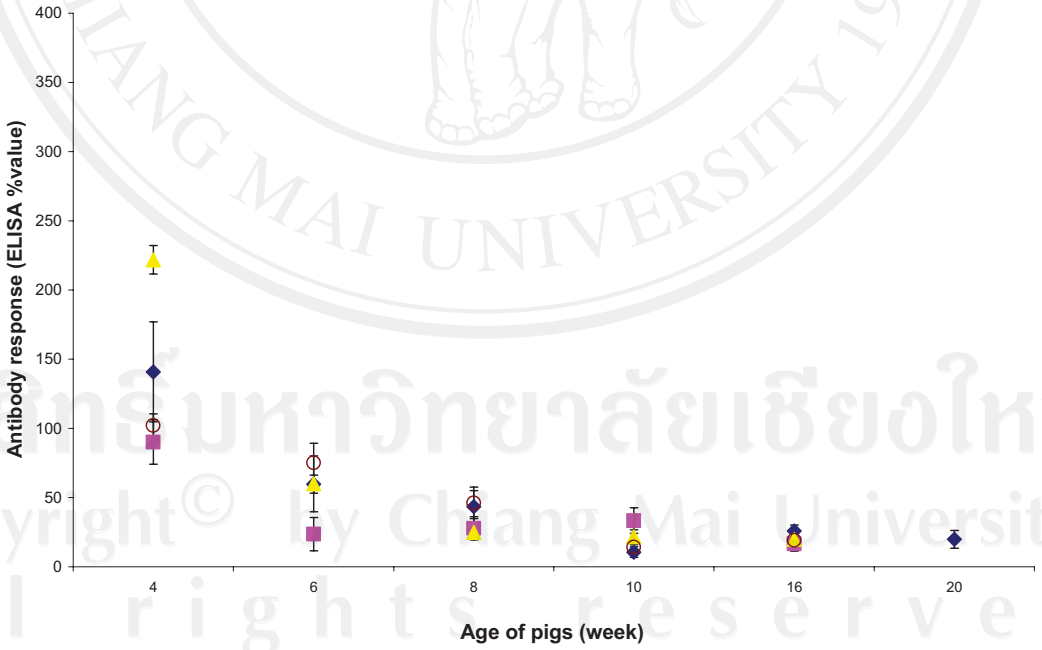


Figure 4.4: Antibody response to APP infection. Values represent means and standard errors of ELISA % value in years 2003 (◆), 2004 (■), 2005(▲) and 2006 (◯): (A) breeding sows, (B) finishing pigs

4.2 Detection of PRRS virus and APP genome

All tonsillar materials collected from 10 culling sows tested negative for PRRS virus by RT-PCR assay (0/10) but they were positive for *A. pleuropneumoniae* by PCR assay (10/10). The PCR provided a normal test sensitivity and enough specificity to detect minimal amounts of DNA material from positive control.

4.3 Performance monitoring

After the intervention, no clinical disease of PRRS or APP was observed in the breeding herd. Even though the genetic line of this herd did not change during long term closure strategy, the pigs' performances gradually improved. A summary of performance data from each year is shown in Table 4.2.

Growth performance of weaned pigs was calculated as weight gain per litter. If the farrowing barn set a weaning target at a weaning period of 21 days by 10 wean pigs/litter and a growth rate of 250 grams/day, litter weight gain will be 67.5 kg/day (standard line in Figure. 4.4).

In 2004, though the piglets were reared with a long lactation period, litter weight gain (LWG) was still under the standard line. Since 2005, LWG was above standard and pigs born alive was significantly ($p<0.05$) higher than before the study (Figure. 4.5). In the finishing stage, pig loss rates improve. Moreover, times to market were shorter than before the study.

Table 4.2: Production performance in piglets at weaning and fattening at market weight from years 2003 through 2006

	2003 (**before study**)	**2004**	**2005**	**2006**
Pigs born alive/litter	10.43±0.44 [a]	10.34±0.96 [a]	11.04±0.44 [b]	11.89±0.33 [b]
Piglets weaned/litter	10.23±2.04	9.61±1.88	10.42±1.39	11.57±1.63
Preweaning mortality	3.87±2.21	3.38±2.34	2.96±0.89	4.14±1.27
Average litter weight gain (kg)	2.33±0.49	2.25±0.47	2.63±0.36	2.86±0.45
Pig weaned/sow/year	22.39±3.37 [a]	23.54±5.36 [a]	25.53±3.32 [a]	27.11±2.98 [b]
Fattening loss rate (%)	3.50±1.12	2.72±1.30	1.83±1.14	0.50±0.37
Day on feed at fattening	111.4±6.3[a]	111.6±4.78 [a]	108.2±7.09[b]	100.1±4.65 [b]
Average daily weight gain (g)	729±26.82 [a]	696±32.10 [a]	735±48.24 [a]	767±19.22 [b]
Feed conversion rate	2.59±0.20	2.58±0.12	2.63±0.13	2.53±0.15

[a,b] Values with different superscripts within a row are significantly different ($P < 0.05$)

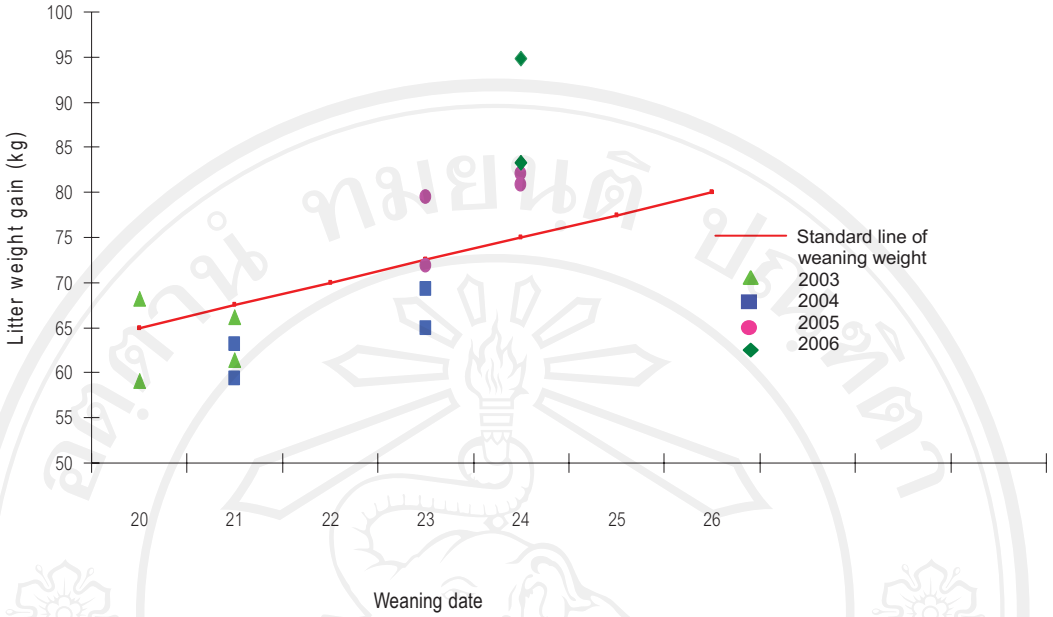


Figure 4.5: The development of litter weaning weight (kg) from 2003 through 2006