

Prevalence of Maternally Derived IAV-S Antibodies in Suckling Pigs in 28 US Swine Herds



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INTRODUCTION

Influenza A virus in swine (IAV-S) is known to persist in swine breeding herds. The herd level prevalence of IAV and within herd prevalence of IAV-S antibodies in US swine herds is poorly understood.

MATERIALS AND METHODS

A convenience sample of 28-mixed parity herds (inventory > 2000) from 7 states were enrolled and completed a 73-question survey regarding herd characteristics and management practices. Three to five day old piglets were serum sampled in three separate cohorts at monthly intervals. Each sampling consisted of 2 pigs from 24 litters (n=48), stratified over three dam parity groups (parity 1, parity 2-3 and parity 4+). Antibodies in serum against IAV-S were detected with three assays: 1) NP ELISA assay (NP), 2) Hemagglutination Inhibition (HI) assay against H1N1 (H1 classical) and 3) an HI assay against H3N2 (H3 cluster 1/3).

RESULTS

The enrolled herds had a median size of 2,800 from which 124-146 samples were collected per farm. All herds had antibodies against IAV-S detected by at least one of the tests. There were no significant differences between herds for mean NP (Figure 1), and Log2 mean H1 or H3 titers. For all assays, P4+ sows had higher antibody levels than P2-3 and P1 sows and P2-3 were higher than P1 sows (p<0.001). Increasing the length of herd closure and the age of gilts at entry were associated with lower odds of NP positive results. IAV-S vaccination of gilts or sows was associated with a higher odds of H1 and H3 positive results (cut point = 160). Herds closed for PEDv or those that employed continuous flow gilt development had lower odds of H3 positive results.

DISCUSSION AND CONCLUSION

IAV-S infection is common in US swine herds. A high degree of within herd variation was observed in all herds (Table 1) and is expected due to variation in colostrum quality and piglet colostrum intake. Herd management practices influence the probability of maternally derived antibodies against IAV-S in piglets.

Figure 1.

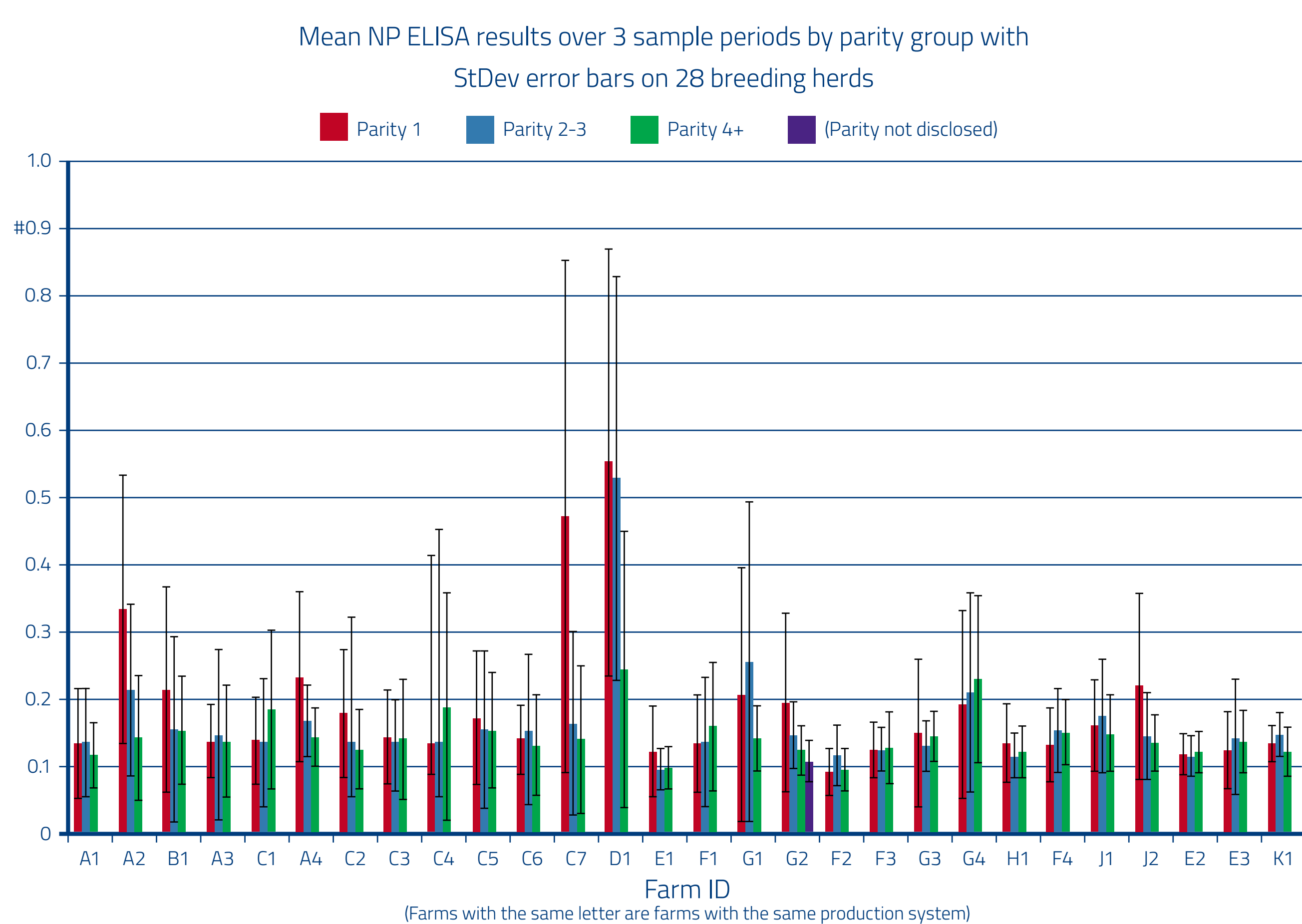


Table 1. GeoMean titers and counts of individual piglet titers by dam parity for H1 and H3 in 28 sow herds.

H1N1 HI test										H3N2 HI test																														
Farm Number	GeoMean H1N1 titer	Parity 1						Parity 2-3						Parity 4+						Farm Number	GeoMean H3N2 titer	Parity 1						Parity 2-3						Parity 4+						
		10	20	40	80	160	320	640	10	20	40	80	160	320	640	10	20	40	80			160	320	640	10	20	40	80	160	320	640	10	20	40	80	160	320	640		
A1	87.662	2	10	16	12	4	4	4	4	7	16	7	5	6	1	5	13	16	7	3	2	1	2	13	20	8	5	1	13	9	11	5	8	2	3	15	16	6	6	1
A2	92.874	2	7	14	18	6	1	1	5	6	14	15	6	1	2	2	4	8	13	10	9	1	13	9	11	5	8	2	4	12	14	7	5	6	4	12	14	7	5	6
B1	40.000	18	7	10	5	5	2	1	4	11	17	6	9	1	7	10	10	11	7	3	3	1	1	9	12	14	5	6	4	4	21	12	2	5	4	4	21	12	2	5
A3	171.980		3	11	16	10	8		1	1	7	12	15	12		3	8	7	9	13	5																			
C1	100.310	9	10	4	12	6	5	2	2	2	7	6	17	8	8	1	3	15	18	3	6																			
A4	84.757	16	14	6	7	3	2		9	6	3	2	4	17	7		3	5	5	8	10	17																		
C2	122.327	10	2	4	8	9	14		2	6	5	3	13	6	14		2	13	18	4	7	2																		
C3	110.980	6	5	6	9	5	5	12	2	6	7	8	11	12	2		2	7	15	7	12	5																		
C4	69.156	2	6	11	9	7	6	3	5	12	5	12	9	2	3	1	9	12	11	4	4	5																		
C5	66.627	7	12	13	11	3	2		2	7	5	10	11	6	7	4	10	6	10	9	4	5																		
C6	146.721	19	2	2	4	5	4	12	4	5	2	1	8	3	24	5	1	1	4	4	10	24																		
C7	148.296	12	2	3	11	14	5	1	1	2	5	8	6	28		4	4	6	18	8	8																			
D1	115.855	6	11	5	6	12	4	3	1	7	15	12	5	4	7	1	3	1	2	5	11	25																		
E1	320.000		1	2	6	12	27		2	2	4	6	11	17		1	3	15	14	21																				
F1	440.805	2		1	4	13	30		1		1	3	5	36					7	8	34																			
G1	155.317	2		4	12	11	9	4	3	5	4	8	14	13	5	1		2	4	12	17	10																		
G2	169.723		2	1	7	14	6	2		3	10	11	8	3		2	2	6	8	15	9																			
F2	375.090			1	3	8	12	24		1		3	4	5	35	2	1		3	5	7	30																		
F3	263.955			5	5	12	15	7	6		3	5	13	26		1		1	8	9	28																			
G3	190.273	3	2	2	7	10	7	11		2	4	8	16	15	13			1	3	9	5	6																		
G4	120.204		2	1	13	8	7		2	8	22	20	7	5		1	8	14	13	9	3																			
H1	133.084	1	6	5	14	7	14	1		5	7	13	14	6	3	1	4	10	7	11	10	5																		
F4	301.918	1		3	4	14	2	23	1		2	3	8	9	24	1		2	3	8	8	27																		
J1	297.709		1	2	9	15	21		1	1	3	7	8	13	16		2	5	7	12	22																			
J2	70.589	10	10	11	10	5	2		4	4	12	11	11	5	1		3	5	16	9	11	4																		
E2	196.794	1	1	10	12	10	6		1	1	2	5	18	8	5		2	8	25	11	18																			
E3	169.514	8	1	7	6	7	7	12	3	4	4	4	10	12	11	1		1	2	16	10	18																		
K1	296.280			2	7	18	15		1	2	12	15	12			1	3	4	7	9	18																			

