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Introduction

The Porcine Reproductive and Respiratory Syndrome (PRRS) was first recognized clinically in the EU in 1987, and thereafter it spread through Europe and America. The virus has two genotypes: the type 1 which is predominant in Europe (EU) and the type 2 which is predominant in North America and Asia (NA).

Objective

The aim of this study was to evaluate the dynamics of PRRSV in pig farms, to determine if both genotypes of PRRS virus are circulating, and to estimate its prevalence in pig farms of Costa Rica.

Materials and Methods

In a first stage, in 2015, a total of 260 pigs (1 to 15 weeks of age) from 9 highly PRRS virus infection-suspected farms were sampled. All samples were tested by parallel testing with a commercial enzyme-linked immunoassay (IDEXX Laboratories: 100.0% Se, 99.7% Sp) and Real Time PCR according to the protocols of Applied Biosystems.

In a second stage, in 2016, in order to determine the PRRS genotype, a random population sampling was done all over the country, with a total sampling size of 1278 pigs (8, 10, 12 weeks and breeders) from 25 farms. These samples were analyzed by an ELISA and RT- qPCR simultaneously. Molecular testing was performed in 5 animal pools.

In the second stage, it was determined that none EU genotype was detected in any sample. From a total of 25 pig farms, 11 farms were positive (48%) to ELISA with a total of 344 out 1278 positive pigs. On the other hand, 171 animals were positive to PCR (13.4%) as a result 256 positive pools (Table 1, Fig. 1).

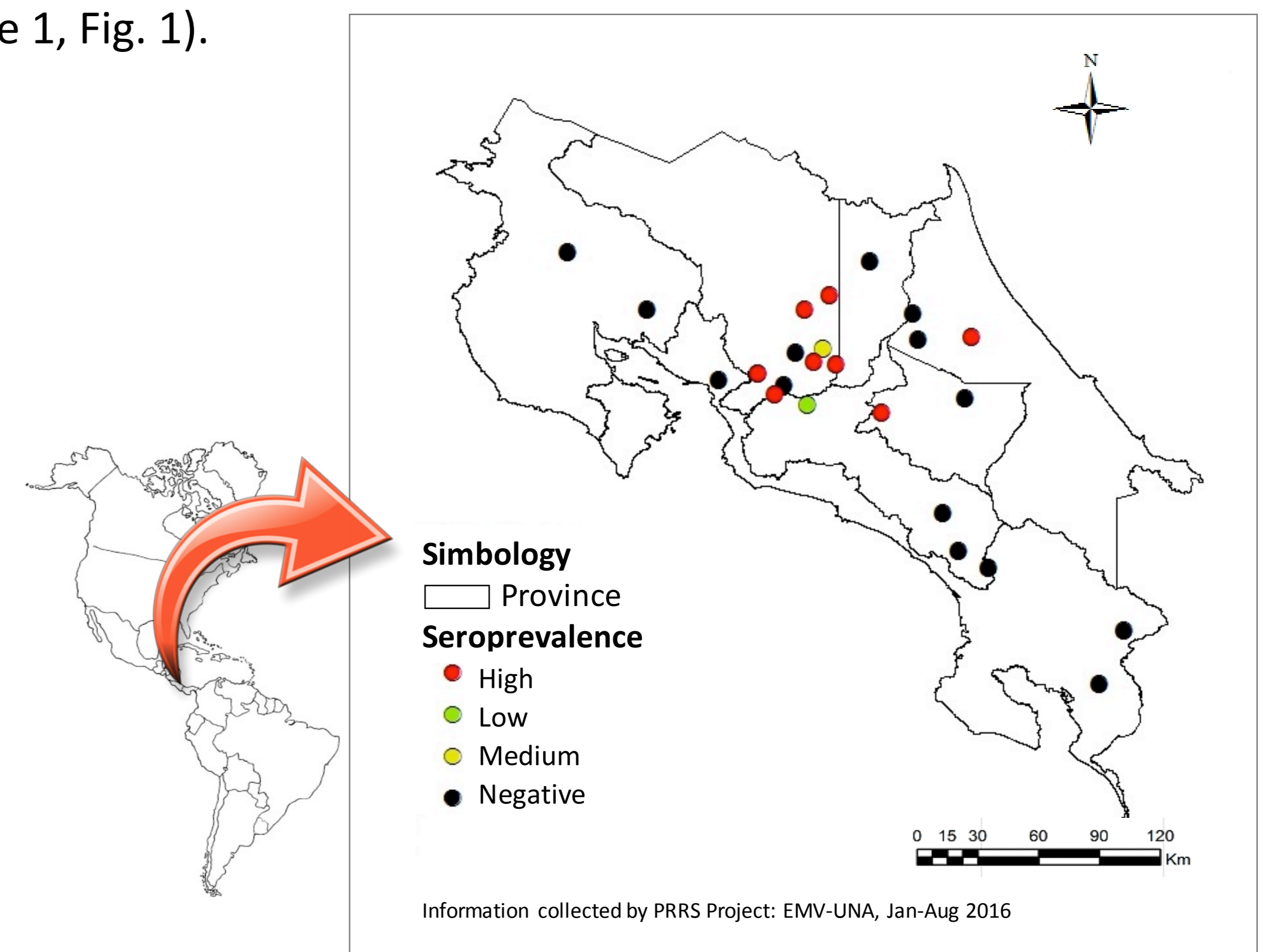


Figure 3. Map of Costa Rica showing the level of seroprevalence, per farm, of NA PRRS virus.

The highest seroprevalence was detected in small farms (54.4%), while the lowest was detected in large farms (22.8%). As expected, there was an increasing trend in the seroprevalences according to age, from 17.4% in pigs of 8 weeks to 39.4% in breeders (Table 1). The results of the RT-qPCR are also depicted in Table 1.

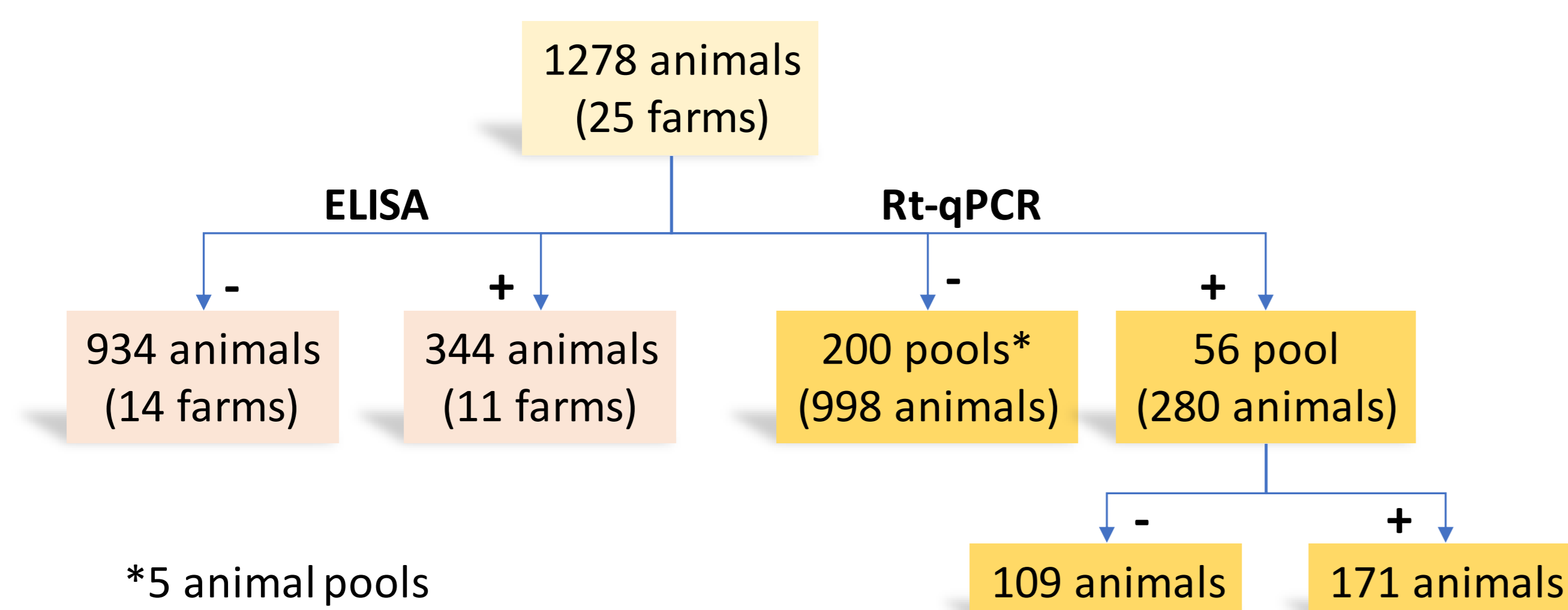


Figure 1. Flow of samples in order to determine the type of PRRS virus circulating in Costa Rican swine farms.

Results

In the first stage it was determined that the viremia begins at week 8 and extends until weeks 10-15 of age; while, the production of antibodies begins at week 12. The cross-linking between the drop in maternal antibodies and the onset of viremia occurred in piglets at 10 weeks of age. In Fig.2 is shown the dynamics of antibodies against NA PRRSV in the first sampling.

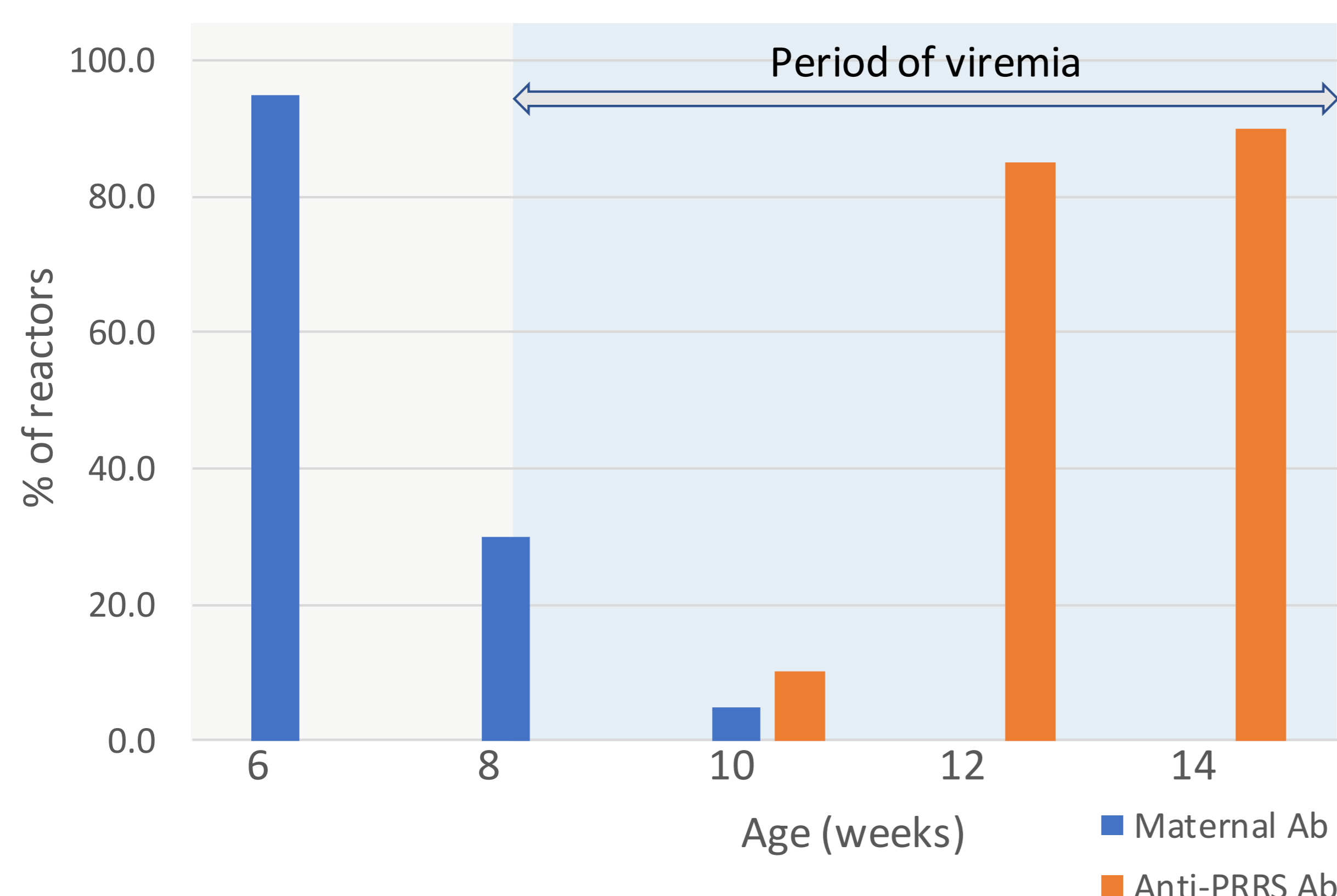


Figure 2. Dynamics of maternal and anti-PRRS virus antibodies (Ab).

Table 1. Prevalence in Costa Rican swine farms according to farm size, age

Variable	Level	ELISA			PCR		
		Positive	Total	%	Positive	Total	%
Farm size	Large	111	487	22.8	60	486	12.3
	Medium	190	715	26.6	81	713	11.4
	Small	43	79	54.4	30	79	38.0
Age (weeks)	8	54	310	17.4	27	307	8.8
	10	68	295	23.1	56	295	19.0
	12	82	321	25.5	74	321	23.1
	Breeders	140	355	39.4	14	355	3.9
	Province	Cartago	62	108	57.4	37	108
	Heredia	43	90	47.8	19	90	21.1
	Alajuela	149	374	39.8	55	372	14.8
	Puntarenas	43	183	23.5	30	183	16.4
	Limón	27	174	15.5	23	173	13.3
	San José	20	225	8.9	7	225	3.1
	Guanacaste	0	127	0.0	0	127	0.0

Conclusion

Based on these results, NA PRRS genotype virus is circulating in Costa Rican pig farms from most of the provinces, and it is affecting animals at different ages.

Acknowledgments

We wish to thank Faryvet Laboratories of Costa Rica and Boehringer Ingelheim for the financial support of the study, and a special thanks to the Ministerio de Ciencia y Tecnología y Telecomunicaciones de Costa Rica for the scholarship given to Ronald Meléndez.