Porcine Reproductive and Respiratory Syndrome Virus(PRRSV) Antibodies and ELISA Kits

PRRSV is a highly contagious disease and most economically devastating disease in the swine industry. It affects millions of pigs in the world. Rapid diseases detection and control is necessary to preserve billions of dollars of animal trade. As a result of PRRS infection, antibodies to several **structural proteins** (Nucleocapsid protein or NP etc.) **and non-structural proteins (NSPs)** are induced. However, NP antibodies are generated at low levels and later in infection, whereas NSP antibodies can be detected much sooner (7-14 weeks post infection or DPI) and stay at higher levels for 6-9 months. Therefore, NSP-antibody based PRRS detection is more sensitive and robust diagnostic tests. Until now only low sensitivity PRRS Type I+II NP IgG commercial ELISA are available. ADI now offers the most sensitive, simple, and rapid ELISA kits for the **detection of PRRS NP antibodies** that can be used for assessing vaccine status and/or infection. **PRRSV NSP antibodies** ELISA kits are used for assessing natural infection (**DIVA tests**). ADI ELISA produced results in 105 min at room temp and has a high sensitivity of 1 ng PRRS antibody.

PRRSV mouse antibody ELISA kits are suitable for PRRSV vaccine efficacy testing.

Assay Procedure: Arrange required number of strips on the plate.

Step 1. Add 100 µl of pre-diluted Controls (-Ve, Cut-off and +ve) and samples (diluted 1:50 or higher) into respective wells. Mix gently and incubate at room temp for 60 mins (25-28oC; no shaking necessary).

Step 2. Aspirate well contents and wash 3X with wash buffer. Add 100 ul of supplied antibody-HRP Conjugate (anti-Pig IgA or IgM or IgG) into all wells; mix gently and incubate at RT for 30mins.

Step 3. Aspirate or wash 5xwith wash buffer. Tap plates over paper towels. Add 100 ul of TMB Substrate. Mix gently and Incubate for 15 min at RT. Blue color develops in positive wells.

Step 4. Add 100 ul of stop solution into each well and mix gently (blue color turns yellow). Measure yellow color at 450 nm. Results are compared to Cut-off control and expressed as +ve and –ve or antibody values determined from Antibody standard curve and expressed as U/ml.

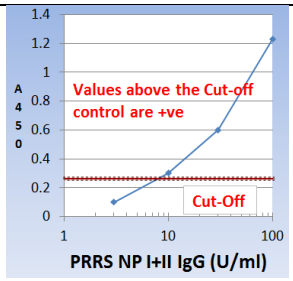
Calculation of Results

Results can be expressed as simple –ve and +ve or PRRS antibody concn (U/ml) determined from standard curve.

Typical ELISA Results

PRRS ELISA	PRRS I+II NSP IgG (U/ml)	Net A450
-ve control	1	0.101
Cut-off control	10	0.300
Positive control	30	0.610
High positive control	100	1.230

Fig. 1. Typical results are shown for PRRS Type I+II Combo. These kits are suitable for assessing vaccination (NP/NSP ELISA) or infection (NSP ELISA).



A typical ELISA Curve

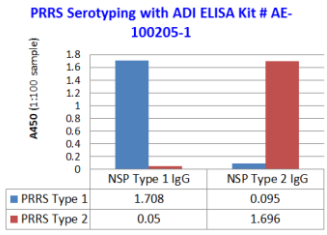


Fig. 2. Sera from experimentally infected pigs with PRRS Type 1 or Type 2 (27 dpi) were tested at 1:100 dilution on ADI PRRS NSP serotyping ELISA kit. Serotypes were clearly identified.

PRRS ELISA Kits Ordering Information

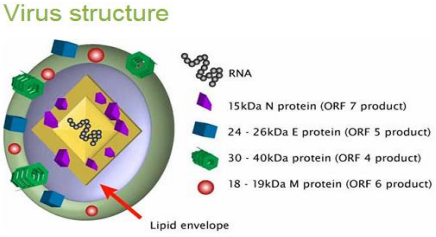
PRRSV Type	ELISA kit Description	PRRSV IgG
Type 1 (European)	Recombivirus **Mouse** anti-PRRS NP Type 1 IgG ELISA kit (96 wells)	RV-400105-1
Type 2 (North American)	Recombivirus **Mouse** anti-PRRS NP Type 2 IgG ELISA kit (96 wells)	RV-400115-1
Type 1+2 Combo	Recombivirus **Mouse** anti--PRRS NP Type 1+2 IgG, Combo ELISA kit (1x 96 or 5x96 tests) (detects I+II as a mix)	RV-400125-1
Type 1 (European)	Recombivirus **Mouse** anti-PRRS NSP Type 1 IgG ELISA kit (96 wells) for Serotyping of type 1 DIVA Tests	RV-400135-1
Type 2 (North American)	Recombivirus **Mouse** anti-PRRS NSP Type 2 IgG ELISA kit (96 wells) for Serotyping of type 2 DIVA Tests	RV-400145-1
Type 1+2 Combo	Recombivirus **Mouse** anti-PRRS NSP Type 1+2 IgG, Combo ELISA kit (1x 96 or 5x96 tests) (detects I+II as a mix) DIVA Tests	RV-400155-1
Recombinant PRRSV **antigen coated plates** for ELISA	Recombinant PRRSV NP Type 1 antigen coated plates for ELISA (5x96 tests)	RV-400106-1
	Recombinant PRRSV NP Type 2 antigen coated plates for ELISA (5x96 tests)	RV-400116-1
	Recombinant PRRSV NP Type 1+2 antigen coated plates for ELISA (5x96 tests)	RV-400126-1
	Recombinant PRRSV NSP Type 1 antigen coated plates for ELISA (5x96 tests)	RV-400136-1
	Recombinant PRRSV NSP Type 2 antigen coated plates for ELISA (5x96 tests)	RV-400146-1
	Recombinant PRRSV NSP Type 1+2 antigen coated plates for ELISA (5x96 tests)	RV-400156-1

PRRSV Recombinant Proteins, Antibodies, and Serum Controls

Type	Catalog#	Product Description	Product Type
PRRSV Type 1 (European)	PRSNP11-PNC	Porcine reproductive and Respiratory syndrome virus 1 nuclear protein (PRRSV1-NP) antibody negative control serum	Disease serum, Porcine
	PRSNP12-PPC	Porcine reproductive and Respiratory syndrome virus 1 nuclear protein (PRRSV1-NP) antibody positive control serum	Disease serum, Porcine
	PRSNP15-R-10	Recombinant (E.coli) Porcine reproductive and respiratory syndrome virus 1 nuclear protein (PRRSV1-NP) (His tag, >95%)	Recombinant protein
	PRSNP11-S	Anti-Porcine reproductive and Respiratory syndrome virus 1 nuclear protein (PRRSV1-NP) antiserum	Antiserum
	PRSNSP13-PNC	Porcine reproductive and Respiratory syndrome virus 1 nonstructural protein1 (PRRSV1-NSP1) antibody -ve control serum	Disease serum, Porcine
	PRSNSP14-PPC	Porcine reproductive and Respiratory syndrome virus 1 nonstructural protein1 (PRRSV1-NSP1) antibody +ve control serum	Disease serum, Porcine
	PRSNSP16-R-10	Recombinant (E.coli) PRRSV1 nonstructural protein (PRRSV1-NSP1) (his tag >95%)	Recombinant protein
	PRSNSP15-S	Anti-Porcine reproductive and Respiratory syndrome virus 1 nonstructural protein (PRRSV1-NSP) antiserum	Antiserum
PRRSV Type 2 (American)	PRSNP21-PNC	Porcine reproductive and Respiratory syndrome virus 2 nuclear protein1 (PRRSV2-NP1) antibody negative control serum	Disease serum, Porcine
	PRSNP22-PPC	Porcine reproductive and Respiratory syndrome virus 2 nuclear protein1 (PRRSV2-NP1) antibody positive control serum	Disease serum, Porcine
	PRSNP25-R-10	Recombinant (E.coli) Porcine reproductive and respiratory syndrome virus 2 nuclear protein (PRRSV2-NP) (his tag, >95%)	Recombinant protein
	PRSNP21-S	Anti-Porcine reproductive and Respiratory syndrome virus 2 nuclear protein (PRRSV2-NP) antiserum	Antiserum
	PRSNSP23-PNC	Porcine reproductive and Respiratory syndrome virus 2 nonstructural protein1 (PRRSV2-NSP) antibody -ve control serum	Disease serum, Porcine
	PRSNSP24-PPC	Porcine reproductive and Respiratory syndrome virus 2 nonstructural protein1 (PRRSV2-NSP) antibody positive control serum	Disease serum, Porcine
	PRSNSP26-R-10	Recombinant (E.coli) PRRSV2 nonstructural protein (PRRSV2-NSP) (his tag, 30 kDa) purified	Recombinant protein
	PRSNSP22-S	Anti-Porcine reproductive and Respiratory syndrome virus 2 nonstructural protein (PRRSV2-NSP) antiserum	Antiserum

Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) –General Information

Porcine Reproductive and Respiratory Syndrome (PRRS) is a disease found in swine farms worldwide and it is characterized by reproductive failure such as late-term abortions in sows and by respiratory illness and mortality in young pigs. PRRS is caused by porcine reproductive and respiratory syndrome virus (**PRRSV**), a small, enveloped, positive-stranded RNA virus. It is a member of the family Arteriviridae, which includes Equine arteritis virus, Lactate dehydrogenase elevating virus of mice and Simian hemorrhagic fever virus in the order Nidovirales. The pig (*Susscrofa*), whether domestic or feral, is the only species known to be **naturally susceptible to PRRS disease**. The continuous circulation of the virus among the pig population causes severe economic loss for the swine industry.



PRRSV can be differentiated into two genotypes: **Type 1 (European strains) and Type 2 (North American strains)** that share ~ 55-60% nucleotide sequence identity. The extensive antigenic and genetic variations among field strains of PRRSV are largely responsible for the poor cross-protection of the current vaccines against heterologous strains. The **PRRSV genome** is~ **15 kb** and encodes the **non-structural proteins (n**sp1-12) that play a key role in viral replication and transcription. The virion contains three major structural proteins, an **envelope glycoprotein** (ORF5, GP5 ~25 kda), unglycosylated **membrane protein** M (ORF6, ~18 kda), and **nucleoprotein or nucleocapsid** (ORF7, N ~15 Kda). ORF7/NP is among the most antigenic proteins of PRRS upon infection.

Diagnosis of PRSSV is by **virus isolation (VI),** detection of PRRS antigen by fluorescent antibody tests (FAT) or immunohistochemistry (IHC), or detection of PRRS by **PCR**. Serology tests for PRRS antibody like indirect immunofluorescent antibody **(IFA**), serum neutralization, and enzyme-linked immunosorbent assay (**ELISA**) have been used. Commercial ELISA kits based on PRRSV antigens from type 1+2 (Combo) is widely used for the diagnosis of PRRS. There are no good options in using **PRRS DIVA** test due to inherent issues in using appropriate PRRS vaccines that will allow proper testing.

All currently approved **PRSSV Vaccines** include either **modified-live virus (MLV) vaccine and or killed virus (KV) vaccine**. PRRS MLV vaccine is well recognized for its protective efficacy against PRRSV that are genetically homologous to the vaccine virus. It is of concern, however, for its immunogenicity, cross protective efficacy and safety. PRRS KV vaccine, on the other hand, is well known for its safety, but it only confers limited protection.

PRRS_Vaccines_ELISA_flr 160416A

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