



FMD NSP Ab ELISA KIT

(NSP: Non Structural Protein)



FMDV Information

Foot-and-mouth disease (FMD) is a highly contagious viral infection primarily of cloven-hoofed domestic animals, such as cattle, pigs, sheep, goats, deer, and water buffalo. The FMD virus has seven serotypes : A, O, C, Asia 1, and Southern African Territories (SAT) 1, 2 and 3.

In many countries the disease is controlled by vaccinations that consist of (partly) purified structural proteins (SP) of the FMD virus, and therefore vaccinated animals only elicit antibodies directed against the structural proteins.

Non structural protein (NSP) is expressed only by replicating viruses, and inactivated vaccines are purified to remove the cellular proteins and NSP. Therefore only animals that have been infected with live virus should develop antibodies against NSP.

The detection of antibody to the NSP is the single most reliable indicator of FMDV infection (Lubroth, 1995, De Diego, 1997)

It is known that vaccinated animals, which are exposed to infection, can become persistently infected with FMDV without ever showing clinical signs (Mackay, D.K.J., et. Al., 1998)

In countries that use vaccination to control FMDV outbreaks, it is important to differentiate between antibodies against SP and NSP in order to discriminate between infections from the field and immune response to vaccination.



Explanation of the test

Microwell ELISA kits are the preferred format for screening large numbers of samples. The AniGen FMD NSP Ab ELISA is a Competitive Enzyme Linked Immunosorbent Assay for the qualitative detection of antibody to NSP in sera.

The specially selected Rec. 3ABC antigen is used as a capture material in the test. This enables the FMD NSP Ab ELISA to identify FMDV antibodies in sera with a high degree of accuracy.

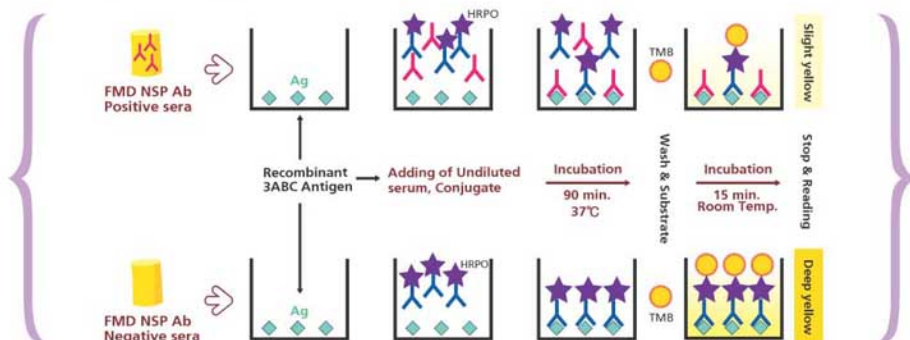
Specifications

Principle	Competitive ELISA
Coated Antigen	Recombinant FMD 3ABC
Specimens	Serum, Plasma
Species	Cattle, Sheep, Goat, Pig
Total Testing Time	2 hours
Shelf life	12 months
Packing size	480 wells/kit
Storage	2 ~ 8 °C
Cat. No.	EB48-01

Advantages

- Differential test of FMD infected or vaccinated
- High Accuracy-equivalent to a world standard ELISA Kit
- Easy Test procedure: No serum pre-dilution required
- Cost effective: No requirement for an uncoated microplate for serum pre-dilution
- Fast Test Result : Within 2 hours
- Free result management software provided

Principle diagram of competitive reaction



Simple & Fast Test Procedure

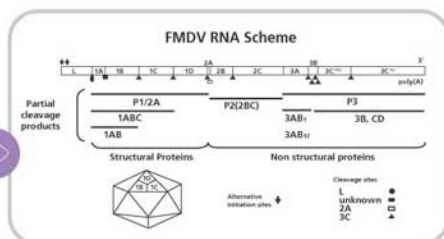


The best way to diagnose the FMDV

EU FMD Committee Recommendation (1989)

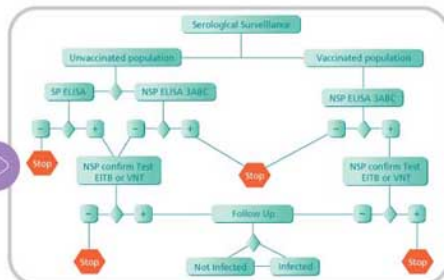
NSP-free or NSP-reduced vaccines in combination with a NSP-test lead to a so-called marker-system.

- NSP 3ABC is the single most reliable indicator of infection.
- Modern, state of the art-vaccines are based upon highly purified antigens, which are free from NSP of the FMD virus.
- Animals, vaccinated with highly purified (NSP-free vaccines), produce antibodies against the Structural Proteins (SP) but not against NSP

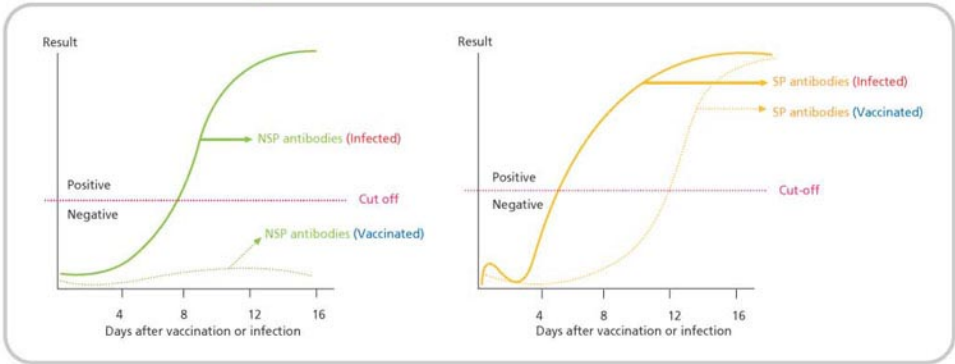


OIE Recommendation (2006)

Use the FMD NSP Ab ELISA for differentiation between vaccinated and infected or convalescing animals, in following the schematic diagram (on the right) of laboratory tests for determining FMDV infection.



FMD Immune response of infected & vaccinated cattle



Differentiation Infected and Vaccinated.

FMDV Status	Serological Test result	
	LPB, VN Test	NSP test
Vaccinated, but Infected	Positive	Positive
Vaccinated, Not infected	Positive	Negative
Non vaccinated, Infected	Positive	Positive
Non vaccinated, Not infected	Negative	Negative

Performance characteristics

1) Cross reactivity to each FMDV serotype

Serotype	Detection Rate (positive no / tested no.)
Asia 1	2/2
SAT 1	3/3
SAT 2	5/5
SAT 3	2/2
Type A	13/13
Type C	3/3
Type O	6/6

AniGen FMD NSP Ab ELISA detects antibodies against all FMDV serotypes

[The performance evaluation was performed in OIE FMD Ref. Laboratory]



2) Comparative Sensitivity study in experimentally infected animals

Species	Post Infection	Detection Rate (positive no./tested no.)		
		AniGen	Company I	Company A
Cattle	5 days	0/17	-	0/17
	7 days	70/92(76.1%)	18/47(38.3%)	54/92(58.7%)
	14-26 days	30/32(93.8%)	30/32(93.8%)	31/32(96.9%)
Sheep and Goat	7 months	3/6	-	3/6
		5/5	2/5	5/5
	10-12 days	0/3*	0/3*	0/3*
		3/3	2/3	3/3
	21 days	1/1*	1/1*	1/1*
7 months	7/10	-	7/10	
Pig	10-12 days	4/5	-	-

AniGen FMD NSP Ab ELISA detects antibodies against nonstructural protein from 7 days to 7 months after infection

(* Experimentally contact challenge animal group. The performance evaluation was performed in OIE FMD Ref. Laboratory)

3) Sensitivity study

Seroprevalence rates(%) in assessment of cattle and swine sera collected for post-outbreak surveillance

	Detection Rate (positive no./tested no.)			
	AniGen	Company C	Company I	Company J
Cattle	254/361 (70.3%)	257/361 (71.1%)	133/361(36.8%)	89/361(24.6%)
Swine	20/214(9.3%)	19/214 (10.3%)	14/214(6.5%)	NT

4) Comparative Specificity Study in multiple vaccinated animals

Species	Vaccine type	No. of vaccination	Detection Rate (positive no./tested no.)		
			AniGen	Company C	Company I
Cattle	A. O	5-6 times	0/11	0/11	-
	A. O, Asia1	4 times	1/502	3/511	6/502
	Asia	1 time	1/37	0/37	1/37
Sheep & Goat	Asia	2 times	0/50	0/50	0/12
	A. O, Asia1	2 times	2/88	0/90	0/90
Pig	Asia	1 time	0/41	0/41	-
	Asia	2 times	0/22	0/22	-
Summary (Negative no./tested no)			747/751 (99.47%)	749/751 (99.60%)	634/641 (98.90%)

AniGen FMD NSP Ab ELISA Specificity is 99.47%, this kit can differentiate between vaccinated and infected animals

(The vaccines were made by Bayer and FGI(ARRIA, Russia). The performance evaluation was performed in OIE FMD Ref. Laboratory)

5) Specificity Study

	Cattle	Pig	Sheep & Goat
Tested No.	2,760	2,116	363
Negative No.	2,759	2,115	363
Specificity	99.96%	99.95%	100%

6) Comparative detection rate in non-infected animals in contact during experimental infection

Species	Post inoculation	Detection Rate (positive no./tested no.)		
		AniGen	Company C	Company I
Sheep and Goat	10-12 days	0/2**	0/2	0/2
	21 days	2/2	2/2	2/2

AniGen FMD NSP Ab ELISA can detect antibodies against NSP from in contact animals during FMD outbreak

(**The number of artificial infection was 6, and the contact number was 2. The performance evaluation was performed in OIE FMD Ref. Laboratory)

For more information, Contact local distributor: