HRPro® FMDV Type A AB ELISA

CAT.NO. EM -FMD-03

GENERAL DESCRIPTION

Foot and mouth disease (FMD) is the most contagious disease of mammals and has a great potential for causing severe economic loss in susceptible cloven-hoofed animals. There are seven serotypes of FMD virus, namely, O, A, C, SAT 1, SAT 2, SAT 3 and Asia 1.

FMDV infected and vaccinated animals produce antibodies against major neutralizing epitope, site A (141-160), of VP1 protein. The OIE had prescribed serological test for structural protein (SP) antibodies by virus neutralization, liquid-phase blocking enzyme-linked immunosorbent assay. The ELISA for detection antibody against FMDV structural protein (SP) is serotype specific, sensitive and quantitative, and has the advantage that it is quicker to perform, is less variable.

HRPro® FMDV Type A AB ELISA was developed to detect neutralizing antibodies against FMDV Serotype A using recombinant FMDV rP13C protein and monoclonal antibodies (MABs) against site A epitope of FMDV VP1. In areas where animals have been vaccinated, SP antibody tests can be used to monitoring the serological response to the vaccination. When large numbers of sera need to be tested, also be managed by the first mass screening samples. The ELISA can be used to serum from cattle, pigs, goats and sheep without additional reagents.

HRPro® FMDV Type A AB ELISA is a blocking ELISA based on recombinant P13C proteins (rP13C-A) immobilized on ELISA plates with trapping antibody and peroxidase labeled monoclonal antibodies.

The test is performed by dispensing test samples to the wells of recombinant FMDV P13C antigen coated plate. After incubation and washing, the conjugate is added. FMDV SP antibodies if it contains in the test samples will bind to the P13C protein and will block the binding epitope of HRPO Anti-FMDV A conjugated Mab. After incubation and washing, the TMB substrate is dispensed. If binding of the HRPO conjugate is blocked by SP antibodies in test samples, the unbound conjugate will be washed away and less or no color will be developed. If the HRPO conjugate has bound to antigen color will be developed, it indicate the SP antibodies are absent in test samples.

The result is obtained by comparing the absorbance (OD), which develops in wells containing the samples with the OD from the wells containing the negative control (S/N ratio).

KIT COMPONENTS

	Reagents	192 tests	480 tests
①	FMDV Type A Antigen Coated Plate	2 plates	5 plates
②	10X Washing Buffer	120mℓX1	240mℓX1
③	Dilution Buffer	60mℓX1	60mℓX1
④	HRPO Anti-FMDV Conjugate (Type A)	40mℓX1	70mℓX1
⑤	Positive Control, PC	1.0mℓX1	2.0mℓX1
⑥	Negative Control, NC	1.0mℓX1	2.0mℓX1
⑦	TMB Substrate	30mℓX1	70mℓX1
⑧	Stop Solution	20mℓX1	40mℓX1
⑨	Sealing Film	2 sheets	5 sheets
⑩	Introduction Manual	1 copy	1 copy

PREPARATION

1. All reagents must be allowed to come to room temperature (20~25℃) before use. Mix reagents by gentle swirling.
2. 1X washing buffer preparation
   1) Shake 10X Washing Buffer(②) gently.
   2) Dilute 1 part of 10X Washing Buffer(②) with 9 parts of deionized water. The diluted 1X washing buffer is stable for 2 weeks at room temperature (20~25℃).
3. Sample preparation
   1) Serum samples (bovine, swine, sheep and goats, etc.) may be used in this assay.
   2) Use fresh samples for the best result. Serum samples can be stored at 2~8°C for less than 3 days or –20℃ for a longer period. Do not freeze and thaw serum samples repeatedly. Sera with hemolysis or bacterial contamination are not suitable for the analysis!
   3) Visible solid materials in serum samples should be separated by centrifugation.
4. TMB Substrate (⑦) should be warmed up for 30 minutes at room temperature (20~25℃) before use (10mℓ/plate). If stored at low temperature, the color development may be poor.

TEST PROCEDURE

1. Remove the Antigen Coated Plate (①) from protective foil pouch.
2. Dispense 80☒ of Dilution buffer(③) into each well of the FMDV Type A Antigen Coated Plate(①).
3. Add 20☒ of samples, PC(⑤) and NC(⑥) into appropriate wells of plate containing dilution buffer. Final dilution factor is 1:5. Use care not to spill samples from well to well.
4. Seal the plate and incubate for 60 minutes at room temperature (25± 1.0℃).
5. Wash each well 3 times with 1X washing buffer (300☒ per well). And remove contents of well at each washing steps. After final washing, hit plate to the paper towel briefly to remove solution.

6. Dispense 100☒ of HRPO Anti-FMDV Conjugate (Type A)(④) to each well.
7. Seal the plate and incubate for 60 minutes at room temperature (25± 1.0℃).
8. Wash each well as step 5.
9. Dispense 100☒ of TMB substrate solution to each well.
10. Seal the plate and incubate for 15 minutes at room temperature(25± 1.0℃). Check the density of color development by naked eyes.
11. Add 50☒ of Stop Solution (⑧) to each well of the plate. Shake the test plate shortly (5~10 sec). Be careful not to spill.
12. Measure and record the A (450nm) for samples and controls immediately.
13. Validate and calculate the results.

Plate template example (1-well Test)

	1	2	3	4	5	6	7	8	9	10	11	12
A	PC	PC	13	21	29	37	45	53	61	69	77	85
B	NC	NC	14	22	30	38	46	54	62	70	78	86
C	1	7	15	23	31	39	47	55	63	71	79	87
D	2	8	16	24	32	40	48	56	64	72	80	88
E	3	9	17	25	33	41	49	57	65	73	81	89
F	4	10	18	26	34	42	50	58	66	74	82	90
G	5	11	19	27	35	43	51	59	67	75	83	91
H	6	12	20	28	36	44	52	60	68	76	84	92

RESULT INTERPRETATION

1. Validate if the mean OD of the NC is higher than 0.60 and the mean OD of the PC is lower than 0.40. If these criteria are not met, the test are invalid and the samples must be retested.
2. Calculate the sample to negative ratio (SN) by following the formula

$$SN = \frac{\text{Sample OD}}{\text{NC mean OD}}$$

3. Result interpretation
   1) Test samples having ≤0.60 S/N are positive.
   2) Test samples having >0.60 S/N are negative.

S/N value	Interpretation
S/N ≤ 0.60	Positive
S/N > 0.60	Negative

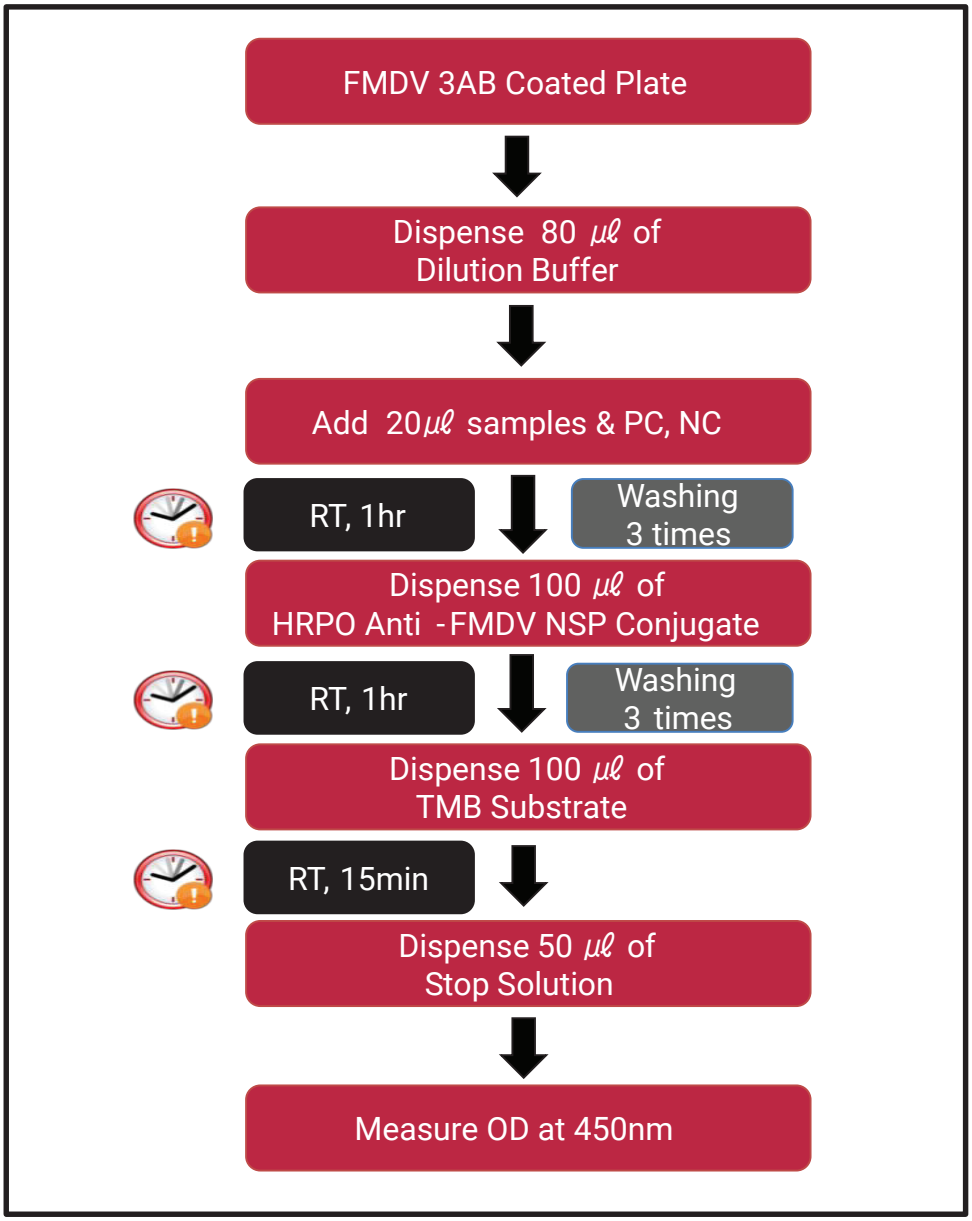
4. Example of result calculation and interpretation
   1) ODs of PC : 0.085, 0.091
      Mean OD = (0.085 + 0.091) / 2 = 0.088 (valid)
   2) ODs of NC :1.121, 1.201
      Mean OD = (1.121 + 1.201) / 2 = 1.161 (valid)
   3) OD of Sample : 0.431
      S/N value of the sample = (0.431 / 1.161) = 0.371
   4) Result interpretation: Positive

PRECAUTIONS

1. All reagents must be allowed to come to room temperature (20~25℃) before use. Mix reagents by gentle swirling. After use, return to 2~8℃.
2. Read this instruction manual thoroughly and follow all steps strictly for successfuluse of the product.
3. All test samples should be considered potentially infectious and all items contacting the samples should be considered contaminated.
4. Do not use expired or contaminated reagents.
5. Do not use reagents from other kits or lots.
6. Do not mix reagents from different lots of this same product.
7. Do not expose the reagents to excessive heat or direct light during storage and incubation.
8. Incomplete washing adversely may affect the result and precision of the assay.
9. Avoid microbial contamination of the reagents.
10. Avoid contamination of the TMB Substrate(⑦) with the HRPO Anti-FMDV Conjugate (Type A)(④).
11. Wear personal protective equipment (PPE) such as lab coat, goggle, and disposable gloves while performing the assay. Wash hands thoroughly afterwards.
12. Do not eat, drink, smoke or apply cosmetics where kit reagents are handled. Do not pipette by mouth.
13. Pipette tips must be changed after each pipetting step. Use a clean disposable pipette tip for all steps.
14. Use care not to spill samples from well to well.
15. Deionized water or equal must be used to prepare the washing buffer.
16. Unused strips should be stored in the sealed foil pouch at 2~8℃. Re-sealed strips are recommended to use within one week.
17. For veterinary use only.

STORAGE AND STABILITY

Store all reagents at 2~8℃. Do not freeze. Reagents remain stable until the expiration date when stored as instructed.

Manufactured by VETIPEX Inc.
10665 Jasper Avenue, 14th Floor Edmonton, Alberta, T5J 3S9, Canada.
Tel: 001 780 604 7810
E-mail: info@vetipex.com
www.vetipex.com

QUICK PROTOCOL