

Bovine Foot and Mouth Disease Virus (FMDV) antibody ELISA Kit

Cat#: orb403263 (ELISA Manual)

PRINCIPLE OF THE ASSAY

The microtiter plate provided in this kit has been pre-coated with FMDV special antigen. Controls or samples are pipetted into the wells and any FMDV antibody present is bound by the immobilized antigen. After washing, the Horseradish Peroxidase (HRP)-conjugated FMDV antibody is added to the wells. The reaction between HRP-conjugated FMDV antibody and immobilized antigen is blocked by the bounded FMDV antibody in the controls or samples. Following a wash to remove any unbound enzyme reagent, a substrate solution is added to the wells and color develops in opposite to the amount of bovine FMDV antibody bound in the initial step. The color development is stopped and the intensity of the color is measured.

SPECIFICITY

This assay has high sensitivity and excellent specificity for detection of bovine FMDV antibody. No significant cross-reactivity or interference between bovine FMDV antibody and analogues was observed.

Note: Limited by current skills and knowledge, it is impossible for us to complete the cross-reactivity detection between bovine FMDV antibody and all the analogues, therefore, cross reaction may still exist.

PRECISION

Intra-assay Precision (Precision within an assay): CV%<15%

Three samples of known concentration were tested twenty times on one plate to assess.

Inter-assay Precision (Precision between assays): CV%<15%

Three samples of known concentration were tested in twenty assays to assess.

LIMITATIONS OF THE PROCEDURE

- **FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.**
- The kit should not be used beyond the expiration date on the kit label.
- Do not mix or substitute reagents with those from other lots or sources.
- Any variation in operator, pipetting technique, washing technique, incubation time or temperature, and kit age can cause variation in binding.
- This assay is designed to eliminate interference by soluble receptors, binding proteins, and other factors present in biological samples. Until all factors have been tested in the Immunoassay, the possibility of interference cannot be excluded.

MATERIALS PROVIDED

Reagents	Quantity
Coated assay plate	1(96 wells)
HRP-conjugate	1 x 12 ml
Sample Diluent	1 x 15 ml
Wash Buffer (20 x concentrate)	1 x 30 ml
Substrate A	1 x 8 ml
Substrate B	1 x 8 ml
Stop Solution	1 x 8 ml
Negative Control	1 x 1.6 ml
Positive Control	1 x 1.2 ml
Adhesive Strip (For 96 wells)	4
Instruction manual	1

STORAGE

Unopened kit	Store at 2 -8°C. Do not use the kit beyond the expiration date.
Opened kit	May be stored for up to one month at 2 -8° C.

***Provided this is within the expiration date of the kit.**

OTHER SUPPLIES REQUIRED

- Microplate reader capable of measuring absorbance at 450nm.
- Squirt bottle, manifold dispenser, or automated microplate washer.
- Absorbent paper for blotting the microtiter plate.
- 1000ml graduated cylinders.
- Deionized or distilled water.
- Pipettes and pipette tips.
- Test tubes for dilution.

PRECAUTIONS

The Stop Solution provided with this kit is an acid solution. Wear eye, hand, face, and clothing protection when using this material.

SAMPLE COLLECTION AND STORAGE

Serum Use a serum separator tube (SST) and allow samples to clot for two hours at room temperature or overnight at 4°C before centrifugation for 15 minutes at 1000 xg. Remove serum and assay immediately or aliquot and store samples at -20°C or -80°C. Avoid repeated freeze-thaw cycles

SAMPLE PREPARATION

Serum samples require a 2-fold dilution into Sample Diluent. The suggested 2-fold dilution can be achieved by adding 100µl sample to 100µl of Sample Diluent.

Note:

1. Biorbyt is only responsible for the kit itself, but not for the samples consumed during the assay. The user should calculate the possible amount of the samples used in the whole test. Please reserve sufficient samples in advance.
2. Samples to be used within 5 days may be stored at 2-8°C, otherwise samples must be stored at -20°C (≤1month) or -80°C (≤2month) to avoid loss of bioactivity and contamination.
3. Grossly hemolyzed samples are not suitable for use in this assay.
4. If the samples are not indicated in the manual, a preliminary experiment to determine the validity of the kit is necessary.
5. Influenced by the factors including cell viability, cell number and also sampling time, samples from cell culture supernatant may not be detected by the kit.
6. Fresh samples without long time storage are recommended for the test. Otherwise, protein degradation and denaturalization may occur in those samples and finally lead to wrong results.

REAGENT PREPARATION

Note:

- **Kindly use graduated containers to prepare the reagent. Please don't prepare the reagent directly in the Diluent vials provided in the kit.**
- Bring all reagents to room temperature (20-30°C) before use for 30 min.
- Distilled water is recommended to be used to make the preparation for reagents or samples. Contaminated water or container for reagent preparation will influence the detection result.

Wash Buffer(1x)- If crystals have formed in the concentrate, warm up to room temperature and mix gently until the crystals have completely dissolved. Dilute 30 ml of Wash Buffer Concentrate (20 x) into 570 ml deionized or distilled water to prepare 600 ml of Wash Buffer (1 x).

ASSAY PROCEDURE

Bring all reagents and samples to room temperature (20-30°C) before use for at least 30 minutes. Centrifuge the sample again after thawing before the assay. It is recommended that all samples and controls be assayed in duplicate.

1. Prepare all reagents, and samples as directed in the previous sections.
2. Refer to the Assay Layout Sheet to determine the number of wells to be used and put any remaining wells and the desiccant back into the pouch and seal the ziploc, store unused wells at 4°C.
3. Set three Negative Control wells and two Positive Control wells.

4. Add 100µl of **Negative Control**, **Positive Control** or diluted **Sample** per well.
5. Cover with the adhesive strip provided. Incubate for 60 minutes at 37°C.
6. Aspirate each well and wash, repeating the process four times for a total of five washes. Wash by filling each well with **Wash Buffer** (300µl) using a squirt bottle, multi-channel pipette, manifold dispenser, or autowasher, and let it stand for 30 seconds, complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining wash Buffer by aspirating or decanting. Invert the plate and blot it against clean paper towels.
7. Add 100µl of **HRP-conjugate** to each well. Incubate for 30 minutes at 37°C.
8. Repeat the aspiration/wash process for five times as in step 6.
9. Add 50µl of **Substrate A** and 50µl **Substrate B** to each well. Incubate for 10 minutes at 37°C. Protect from light.
10. Add 50µl of **Stop Solution** to each well, gently tap the plate to ensure thorough mixing.
11. Determine the optical density of each well within 10 minutes, using a microplate reader set to 450 nm.

***Samples may require dilution. Please refer to Sample Preparation section.**

Note:

1. The final experimental results will be closely related to validity of the products, operation skills of the end users and the experimental environments.
2. Samples or reagents addition: Please carefully add samples to wells and mix gently to avoid foaming. Do not touch the well wall as possible. For each step in the procedure, total dispensing time for addition of reagents or samples to the assay plate should not exceed 10 minutes. This will ensure equal elapsed time for each pipetting step, without interruption. Duplication of all specimens, although not required, is recommended. To avoid cross-contamination, change pipette tips between sample additions, and between reagent additions. Also, use separate reservoirs for each reagent.
3. Incubation: To ensure accurate results, proper adhesion of plate sealers during incubation steps is necessary. Do not allow wells to sit uncovered for extended periods between incubation steps. Once reagents have been added to the well strips, DO NOT let the strips DRY at any time during the assay. Incubation time and temperature must be observed.
4. Washing: The wash procedure is critical. Complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining Wash Solution by aspirating or decanting and remove any drop of water and fingerprint on the bottom of the plate. Insufficient washing will result in poor precision and falsely elevated absorbance reading. When using an automated plate washer, adding a 30 second soak period following the addition of wash buffer, and/or rotating the plate 180 degrees between wash steps may improve assay precision.
5. Controlling of reaction time: Observe the change of color after adding Substrate (e.g. observation once every 10 minutes), Substrate should change from colorless or light blue to gradations of blue. If the color is too deep, add Stop Solution in advance to avoid excessively strong reaction which will result in inaccurate absorbance reading.
6. Substrate is easily contaminated. Substrate should remain colorless or light blue until added to the plate. Please protect it from light.

7. Stop Solution should be added to the plate in the same order as the Substrate. The color developed in the wells will turn from blue to yellow upon addition of the Stop Solution. Wells that are green in color indicate that the Stop Solution has not mixed thoroughly with the Substrate.

CALCULATION OF RESULTS

For calculation the valence of bovine FMDV antibody compare the sample well with control.

Calculation Formula

All OD values for the test samples as well as the Negative Control are related to the OD value of the Positive Control as follows:

$$\text{Inh (Inhibition)\%} = (\text{OD Negative Control} - \text{OD sample}) / \text{OD Negative Control} \times 100\%$$

- Negative: Inh % < 25%; it represents that bovine didn't infect Foot and Mouth Disease Virus (except for acute-phase of the disease);
- Doubtful: $25 \leq \text{Inh\%} < 40\%$; it represents that bovine may infect Foot and Mouth Disease Virus;
- ☑ Positive: Inh % $\geq 40\%$; it represents that bovine had been infected Foot and Mouth Disease Virus.

The experimental results should meet the following conditions. Should any of these criteria not be fulfilled, the test is invalid and the assay should be repeated.

(1) $\text{OD Negative Control} - \text{OD Positive Control} \geq 0.6$

(2) $(\text{OD positive Control} - \text{OD sample}) / \text{OD Positive Control} \times 100\% \geq 55\%$

It's suggested to use average value for data processing.