Science for Society

Fumonisin B1 ELISA test kit

INSTRUCTION MANUAL

FOR PRODUCT No: LT33001AYSL

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MANUAL VERSION 1.01

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PRINCIPLE

This test kit is based on the indirect competitive enzyme immunoassay for the detection of Fumonisin B1. The coupling antigen is pre-coated on the micro-well stripes. The Fumonisin B1 in the sample and the coupling antigens pre-coated on the micro-well stripes compete for the anti- Fumonisin B1 antibodies. After the addition of the enzyme conjugate, the TMB substrate is added for coloration. The optical density (OD) value of the sample has a negative correlation with the Fumonisin B1 in the sample. This value is compared to the standard curve and the Fumonisin B1 residues is subsequently obtained.

MATERIALS SUPPLIED WITH THIS KIT

1	Micro-well strips	12 strips with 8 removable wells each	6	Substrate B	7 ml, black cap
2	6× standard solution (1 ml each)	0ppb, 0.5ppb, 1.5ppb, 4.5ppb, 13.5ppb, 40.5ppb	7	Stop solution	7 ml, yellow cap
3	Enzyme conjugate	7 ml, red cap	8	20X concentrated wash	40 ml, white cap
4	Antibody working solution	7 ml, blue cap	9	2X concentrated redissolving solution	50 ml, transparent cap
5	Substrate A	7 ml, white cap			

MATERIALS REQUIRED BUT NOT PROVIDED

1) Micropipettors and disposable tips: 0.5μl-10μl, 10μl-100μl, 100μl-1000μl.

2) 37 ℃ Incubator.

3) Measuring cylinder: 500 ml.

4) 96 wells microplate reader.

5) Distilled/De-ionized water.

6) Microplate Washer.

TECHNICAL SPECIFICATIONS

Sensitivity: 0.5 ppb

Incubator temperature: 25℃

Incubator time: 15min-30min

Detection limit:

Feed, peanut, rice, maize -25ppb

Cross-reaction rate:

Fumonisin B1… ….100%

Recovery rate:

Feed, Peanut, Rice, Maize - 95±35%

SAMPLE PRE-TREATMENT

Instructions (The following points must be dealt with before the pre-treatment)

1) Only the disposable tips can be used for the experiments and the tips must be changed when used for absorbing different reagents;

2) Before the experiment, each experimental utensil must be clean and should be re-cleaned if necessary, in order to avoid the contamination that interferes with the experimental results.

Solution preparation before sample pre-treatment:

1) Sample redissolving solution

Use 1 part of 2Xconcentrated redissolving solution and dissolve with 1 part of deionized water to obtain the ready to use sample redissolving solution.

2) Sample extract solution

Use 7 parts of Methanol and dissolve with 3 parts of deionized water to obtain the

ready to use sample extract solution.

SAMPLES PREPARATION

Preparation of Feed, maize sample

1) Take 1.0±0.05g grinded feed or maize sample into 50ml centrifuge tube, add 5ml sample extract solution, shake for 3min, centrifuge at above 4000r/min at 20℃ for 10min;

2) Take up-layer clear liquid 100µl, add 900µl deionized water, shake to evenly;

3) Take 50µl to test

Dilution factor: 50

Note: if measured sample content is beyond the curve range, dilute the sample for many times (for example: take 50ul up-layer clear liquid into a new centrifuge tube, add 950ul deionized water, then the dilution factor is 100)

Preparation of Rice sample

1) Take 1.0±0.05g grinded rice sample into 50ml centrifuge tube; add 5ml sample extract solution, shake for 3min, centrifuge at above 4000r/min at 20℃ for 10 min;

2) Take 100ul up-layer clear liquid, add 900ul sample re-dissolving solution, shake to evenly;

3) Take 50µl to test

Dilution factor: 50

Note: if measured sample content is beyond the curve range, dilute the sample for many times (for example: take 50µl up-layer clear liquid into a new centrifuge tube, add 950ul sample redissolving solution, *then the dilution factor is 100)*

Preparation of Peanut sample

1) Take 1.0±0.05g grinded peanut sample into 50ml centrifuge tube; add 5ml

sample extract solution, then add 4ml N-hexane, shake for 3min, centrifuge at above 4000r/min at 20℃ for 10 min;

2) Discard up-layer clear liquid, take middle-layer liquid 100ul, add 900ul deionized water, shake to evenly;

3) Take 50μl to test

Dilution factor: 50

Note: if measured sample content is beyond the curve range, dilute the sample for many times (for example: take 50μl middle-layer liquid into a new centrifuge tube, add 950ul deionized water, then the dilution factor is 100)

ELISA PROCEDURES

Instructions

1. Bring ELISA reagents to room temperature (20 - 25 °C) before use.
2. Put ELISA reagents back to 2-8 ℃ immediately after use
3. The ELISA reproducibility in the analysis process is largely depends on the consistency of the washing plate, the correct washing plate operation is the point of determination ELISA program
4. In all process of constant temperature incubation, avoid light exposure, seal the microplate with the cover membrane.

PROTOCOL

3. Solution preparation: take the 40ml 20× concentrated washing buffer, dissolve with deionized water at 1:19 (1 part 20× concentrated washing buffer + 19 parts deionized water), or prepare as quantity needed.

4. Numbering: number the micro-wells according to samples and standard solution; each sample and standard solution should be performed in duplicate; record their positions.

5. Add standard/sample: Add 50 μL of the sample or the standard solution into separate duplicate wells, then add enzyme conjugate, 50 μL/well; then antibody working solution, 50 μL/well. Mix gently by shaking the plate manually, seal the microplate with the cover membrane, **incubate at 25 °C for 30 min in the dark.**

6. Wash microplate: Carefully open the cover membrance, pour liquid out of microwell; add 250 μl/well of washing buffer, wash fully for 4-5 times, 15-30 s each time, then take out and flap to dry with absorbent paper.(Use unused spear to pierce bubble after dry)

7. Coloration: add 50 μL of substrate A solution then 50 μL B solution into each well. Mix gently by shaking the plate manually, and **incubate at 25 °C for 15 min in the dark for coloration.**

8. Determination: add 50 μL of the stop solution into each well. Mix gently by shaking the plate manually. Set the wavelength of the microplate reader at 450 nm to determine the OD value of every well. (Recommend to read the OD value at the dual-wavelength 450/630 nm within 5 min).

RESULTS JUDGEMENT

There are two methods to judge the results; the first one is the rough judgment, while the second is the quantitative determination. Note that the OD value of the sample has a negative correlation with the Fumonosin B1 in the sample

QUALITATIVE DETERMINATION

The concentration range (ppb) can be obtained by compared the average absorbance value with standards. Suppose absorbance value of Sample One is 0.3, Sample Two is 1.0, and the standards are: 0ppb of 2.243, 0.5ppb of 1.816, 1.5ppb of 1.415, 4.5ppb of 0.74, 13.5ppb of 0.313, 40.5ppb of 0.155. Then the

concentration of the sample one is in the range of 13.5ppb - 40.5ppb, Sample Two is 1.5ppb - 4.5ppb. The concentration range of Fumonisin B1 in the samples can be obtained by multiplied by the corresponding dilution of the sample.

QUANTITATIVE ANALYSIS

In order to calculate the concentration of samples, a standard curve should be made. Before standard curve is made, the concept of % absorbance should be known.

Calculation of % absorbance:

Percentage of absorbance value = $B/B_0 \times 100\%$

B—the average OD value of the sample or the standard solution

B_0—the average OD value of the 0 ng/mL standard solution

The zero standard is thus made equal to 100 % and the absorbance values are quoted in percentages. The values calculated for the standards are entered in a system of coordinates on semilogarithmic graph paper against the the Fumonisin B1 concentration (ng/ml). The Fumonisin B1 concentration in ng/ml corresponding to the absorbance of each sample can be read from the calibration curve.

Special software for result analysis of ELISA will facilitate double or multiple determinations. If you need, please call to request.

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PRECAUTIONS

1. The room temperature below 25 ℃ or the temperature of the reagents and the samples being not returned to the room temperature (20-25 ℃) will lead to a lower standard OD value.
2. Dryness of the microplate in the washing process will be accompanied by the

situations including the non-linear standard curves and the undesirable reproducibility; So continue to next step immediately after washing.
3. Mix evenly before adding any reagents.
4. The stop solution is the 2 M sulfuric acid solution, avoid contacting with the skin.
5. Do not use the kit exceeding its expiry date. The use of diluted or adulterated reagents from the kits will lead to the changes in the sensitivity and the detecting OD values. Do not exchange the reagents from the kits of different lot numbers to use.
6. Storage: store at 2-8 ℃, not frozen. Put the unused microplate into an auto-sealing bag to re-seal it. The standard substance and the colourless color former is light sensitive, and thus they cannot be directly exposed to the light.
7. Discard the colouration solution with any color that indicates the degeneration of this solution. The detecting value (450/630nm) of the 0 standard solution (0 ppb) of less than 0.5 (A450nm<0.5) indicates its degeneration.
8. The optimum reaction temperature is 25 ℃, and too high or too low temperatures will result in the changes in the detecting sensitivity and OD values.

STORAGE AND EXPIRY DATE

Storage: store at 2-8 ℃, not frozen.

Expiry date: 12 months; date of production is on box.

Note: If the Vacuum package of microplate has leakage, it is still valid to use, do not affect the test result, be relax to use.