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CAP (Chloramphenicol) ELISA Kit

Catalog No: E-FS-E044

96T/96T*3

Version Number:	V1.2
Replace version:	V1.1
Revision Date:	2024.03.14

This manual must be read attentively and completely before using this product.

If you have any problems, please contact our Technical Service Center for help.

Toll-free: 1-888-852-8623 Tel: 1-832-243-6086 Fax: 1-832-243-6017

Email: techsupport@elabscience.com

Website: www.elabscience.com

Please kindly provide us the lot number (on the outside of the box) of the kit for more efficient service.

Test principle

This kit uses Competitive-ELISA as the method for the quantitative detection. It can detect Chloramphenicol (CAP) in samples, such as, muscle, milk, etc. This kit is composed of ELISA Microtiter plate, HRP conjugate, antibody working solution, standard and other supplementary reagents. The microtiter plate in this kit has been pre-coated with coupled antigen. During the reaction, CAP in the samples or standard competes with coupled antigen on the solid phase supporter for sites of anti-CAP antibody. Then Horseradish Peroxidase (HRP) conjugate is added to each microtiter plate well, and substrate reagent is added for color development. There is a negative correlation between the OD value of samples and the concentration of CAP. The concentration of CAP in the samples can be calculated by comparing the OD of the samples to the standard curve.

Technical indicators

Reaction mode (Incubation time and temperature): 25°C; 30 min, 30 min, 15 min.

Detection limit: Muscle, Liver ---0.0125 ppb; Honey, Water ---0.05 ppb; Eggs ---0.1 ppb;
Urine, Serum, Feed ---0.025 ppb; Milk, Milk powder ---0.075 ppb.

Cross-reactivity: Chloramphenicol ---100%; Thiamphenicol, Florfenicol ---< 0.1%.

Sample recovery rate: Muscle, Liver--- 85% ± 20%; Honey, Eggs --- 85% ± 25%; Water ---90% ± 20%;
Milk, Feed, Milk powder ---75% ± 25%; Urine, Serum---70% ± 20%.

Kit components

Item	Specifications
ELISA Microtiter plate	96 wells
Standard Liquid	1 mL each (ppb=ng/mL=ng/g) (0 ppb, 0.025 ppb, 0.075 ppb, 0.225 ppb, 0.675 ppb, 2.025 ppb)
HRP Conjugate	11 mL
Antibody Working Solution	5.5 mL
Substrate Reagent A	6 mL
Substrate Reagent B	6 mL
Stop Solution	6 mL
20×Concentrated Wash Buffer	40 mL
2×Reconstitution Buffer	50 mL
Plate Sealer	3 pieces
Sealed Bag	1 piece
Manual	1 copy

Note: All reagent bottle caps must be tightened to prevent evaporation and microbial pollution

Other materials required but not supplied

Instrument: Microplate reader, Printer, Homogenizer, Nitrogen evaporators, Water bath, Vortex mixer, Centrifuge, Graduated pipette, Balance (sensitivity 0.01 g).

Micropipette: Single channel (20-200 μL , 100-1000 μL), Multichannel (30-300 μL).

Reagents: Ethyl acetate, N-hexane, CH_3COONa , Acetic acid, $\text{Na}_2\text{Fe}(\text{CN})_5(\text{NO}) \cdot 2\text{H}_2\text{O}$, β -glucuronidase (activity $\geq 1,000,000$ units/g), $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$.

Notes

1. The overall OD value will be lower when reagents have not been brought to room temperature before use or room temperature is below 25°C.
2. If the wells turn dry during the washing procedure, it will lead to bad linear standard curve and poor repeatability. Operate the next step immediately after wash.
3. Mix thoroughly and wash the plate completely. The consistency of wash procedure can strongly affect the reproducibility of this ELISA kit.
4. FOR RESEARCH USE ONLY. ELISA Microtiter plate should be covered by plate sealer. Avoid the kit to strong light.
5. **Each reagent is optimized for use in the E-FS-E044. Do not substitute reagents from any other manufacturer into the test kit. Do not combine reagents from other E-FS-E044 with different lot numbers.**
6. Substrate Reagent should be abandoned if it turns color. When OD value of standard (concentration: 0) < 0.5 unit ($A_{450\text{nm}} < 0.5$), it indicates the reagent may be deteriorated.
7. Stop solution is caustic, avoid contact with skin and eyes.
8. As the OD values of the standard curve may vary according to the conditions of the actual assay performance (e.g. operator, pipetting technique, washing technique or temperature effects), the operator should establish a standard curve for each test.
9. Even the same operator might get different results in two separate experiments. In order to get reproducible results, the operation of every step in the assay should be controlled.
10. **For mentioned sample fast and efficient extraction methods are included in the kit description. Please consult technical support for the applicability if other sample need to be tested.**
11. The kit is used for rapid screening of actual samples. If the test result is positive, the instrument method such as HPLC, LC/MS, etc. can be used for quantitative confirmation.

Storage and expiry date

Store the kit at 2-8°C. Do not freeze any test kit components.

Return any unused microwells to their original foil bag and reseal them together with the desiccant provided and further store at 2-8°C.

Expiry date: expiration date is on the packing box

Experimental preparation

Restore all reagents and samples to room temperature (25°C) before use.

Open the microplate reader in advance, preheat the instrument, and set the testing parameters.

1. Sample pretreatment Notice:

Experimental apparatus should be clean, and the pipette should be disposable to avoid cross-contamination during the experiment.

2. Solution preparation

Please prepare solution according to the number of samples. Don't use up all components in the kit at once!

Solution 1: 0.36 M $\text{Na}_2\text{Fe}(\text{CN})_5(\text{NO}) \cdot 2\text{H}_2\text{O}$ Solution (for milk, milk powder samples)

Dissolve 10.7 g of $\text{Na}_2\text{Fe}(\text{CN})_5(\text{NO}) \cdot 2\text{H}_2\text{O}$ to 100 mL with deionized water, mix fully.

Solution 2: 1.04 M ZnSO_4 Solution (for milk, milk powder samples)

Dissolve 29.8 g of $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$ to 100 mL with deionized water, mix fully.

Solution 3: 0.1 M, pH4.8 CH_3COONa Buffer (for urine sample)

Dissolve 2.4 g of CH_3COONa with 500 mL of deionized water, then add 1.2 mL of **Acetic acid** and mix fully.

Solution 4: Reconstitution Buffer

Dilute the **2×Reconstitution Buffer** with deionized water. (2×Reconstitution Buffer (V): Deionized water (V) =1:1). The Reconstitution buffer can be store at 4°C for a month.

Solution 5: Wash Buffer

Dilute the **20×Concentrated Wash Buffer** with deionized water. (20×Concentrated Wash Buffer (V): Deionized water (V) =1:19).

3. Sample pretreatment

3.1 Pretreatment of muscle (fish, shrimp, livestock), liver sample:

- (1) Remove fat from sample. Homogenize the representative sample with a homogenizer and mix fully.
- (2) Weigh 3 ± 0.05 g of homogenate edible sample into a 50 mL centrifuge tube, add 3 mL of deionized water and mix fully, then add 6 mL of **Ethyl acetate** and vortex for 2 min. Centrifuge at 4000 r/min for 10 min at room temperature.
- (3) Take 2 mL of the supernatant to another centrifuge tube, dry at 50-60°C with nitrogen evaporators or water bath. (Please do it in a ventilated environment.)
- (4) Dissolve the residue with 1 mL of **N-hexane**, add 0.5 mL of **Reconstitution Buffer** (Solution 4), and mix fully for 30 s. Centrifuge at 4000 r/min for 5 min at room temperature.
- (5) Discard the upper organic phase, take 50 μL of the lower water layer for analysis.

Note: Sample dilution factor: 0.5, detection limit: 0.0125 ppb

3.2 Pretreatment of serum (swine) sample:

- (1) Take 1 mL of serum into centrifuge tube, add 2 mL of **Ethyl acetate** and vortex for 1 min, centrifuge at 4000 r/min for 5 min at room temperature.
- (2) Take 1 mL of the supernatant to another centrifuge tube, dry at 50-60°C with nitrogen evaporators or water bath.
- (3) Dissolve the residue with 1 mL of **N-hexane**, add 0.5 mL of **Reconstitution Buffer** (Solution 4), and mix fully for 30 s. Centrifuge at 4000 r/min for 5 min at room temperature.
- (4) Discard the upper organic phase, take 50 µL of the lower water layer for analysis.

Note: Sample dilution factor: 1, detection limit: 0.025 ppb

3.3 Pretreatment of urine (swine) sample:

- (1) Take 2 mL of urine into centrifuge tube, mix with 0.5 mL of **0.1 M, pH4.8 CH₃COONa Buffer** (Solution 3), then add 40 µL of **β-glucuronidase**, mix fully and incubation at 37°C for more than 2 hours (or overnight).
- (2) Restore the mixed solution in step 1 to room temperature, add 8 mL of **Ethyl acetate** and vortex for 1 min. Centrifuge at 4000 r/min for 10 min at room temperature.
- (3) Take 4 mL of the supernatant to another centrifuge tube, dry at 50-60°C with nitrogen evaporators or water bath.
- (4) Dissolve the residue with 1 mL of **Reconstitution Buffer** (Solution 4), mix fully.
- (5) Take 50 µL for analysis.

Note: Sample dilution factor: 1, detection limit: 0.025 ppb

3.4 Pretreatment of honey sample:

- (1) Weigh 2 ± 0.05 g of honey sample into centrifuge tube, dissolved with 4 mL of deionized water, add 4 mL of **Ethyl acetate** and vortex for 2 min. Centrifuge at 4000 r/min for 10 min at room temperature.
- (2) Take 2 mL of supernatant to another centrifuge tube, dry at 50-60°C with nitrogen evaporators or water bath.
- (3) Dissolve the residue with 0.5 mL of **Reconstitution Buffer** (Solution 4), mix fully.
- (4) Take 50 µL for analysis.

Note: Sample dilution factor: 0.5, detection limit: 0.05 ppb

3.5 Pretreatment of milk sample:

- (1) Centrifuge the milk at 4000 r/min for 10 min at 15°C, discard upper fat layer (**If a refrigerated centrifuge is not available, chill sample to approx 15°C prior to centrifugation.**). Take 5 mL of fat skim milk into 50 mL centrifuge tube, add 250 µL of **0.36 M Na₂Fe(CN)₅(NO) 2H₂O Solution** (Solution 1) and vortex for 30 s, then add 250 µL of **1.04 M ZnSO₄ Solution** (Solution 2) and vortex for 30 s, centrifuge at 4000 r/min for 10 min at 15°C.
- (2) Take 2.2 mL of the supernatant to another centrifuge tube, add 4 mL of **Ethyl acetate** and vortex for 2 min, centrifuge at 4000 r/min for 10 min at room temperature.
- (3) Take 2 mL of supernatant to another centrifuge tube, dry at 50-60°C with nitrogen evaporators or water bath.
- (4) Dissolved the residue with 0.5 mL of **Reconstitution Buffer** (Solution 4), mix fully.
- (5) Take 50 µL for analysis.

Note: Sample dilution factor: 0.5, detection limit: 0.075 ppb

3.6 Pretreatment of milk powder sample:

- (1) Weigh 2 ± 0.05 g milk powder into 50 mL centrifuge tube, dissolved with 10 mL deionized water, add 1 mL of **0.36 M Na₂Fe(CN)₅(NO) 2H₂O Solution** (Solution 1) and 1 mL of **1.04 M ZnSO₄ Solution** (Solution 2). Vortex for 2 min and centrifuge at 4000 r/min for 10 min at 15°C.
- (2) Take 3.6 mL of the supernatant to another centrifuge tube, add 6 mL of **Ethyl acetate** and vortex for 5 min, centrifuge at 4000 r/min for 10 min at room temperature.
- (3) Take 4 mL of supernatant to another centrifuge tube, dry at 50-60°C with nitrogen evaporators or water bath.
- (4) Dissolve the residue with 0.4 mL of **Reconstitution Buffer** (Solution 4), mix fully.
- (5) Take 50 µL for analysis.

Note: Sample dilution factor: 1, detection limit: 0.075 ppb

3.7 Pretreatment of eggs sample:

- (1) Homogenize the sample use a homogenizer.
- (2) Weigh 1 ± 0.05 g of homogenate sample into 50 mL centrifuge tube, add 8 mL of **Ethyl acetate** and vortex for 2 min. Centrifuge at 4000 r/min for 5 min at room temperature.
- (3) Take 2 mL of the supernatant to another centrifuge tube, dry at 50-60°C with nitrogen evaporators or water bath.
- (4) Dissolve the residue with 2 mL of **N-hexane**, add 1 mL of **Reconstitution Buffer** (Solution 4), and vortex for 2 min. Centrifuge at 4000 r/min for 5 min at room temperature.
- (5) Discard the upper organic phase, take 50 µL of the lower water layer for analysis.

Note: Sample dilution factor: 4, detection limit: 0.1 ppb

3.8 Pretreatment of feed sample:

- (1) Homogenize the representative sample with a homogenizer and mix fully.
- (2) Weigh 2 ± 0.05 g of homogenate sample into 50 mL centrifuge tube, dissolved with 2 mL of deionized water, add 6 mL of **Ethyl acetate** and vortex for 2 min. Centrifuge at 4000 r/min for 10 min at 15°C.
- (3) Take 3 mL of the supernatant to another centrifuge tube, dry at 50-60°C with nitrogen evaporators or water bath.
- (4) Dissolve the residue with 1 mL of **N-hexane**, add 1 mL of **Reconstitution Buffer** (Solution 4), and vortex for 30 s. Centrifuge at 4000 r/min for 5 min at room temperature.
- (5) Discard the upper organic phase, take 50 µL of the lower water layer for analysis.

Note: Sample dilution factor: 1, detection limit: 0.025 ppb

3.9 Pretreatment of water sample:

- (1) Take 0.5 mL of clear water sample into 1.5 mL centrifuge tube (If the sample is cloudy, centrifuge at 4000 r/min for 10 minutes), add 0.5 mL of **2×Reconstitution Buffer** and vortex for 1 min.
- (2) Take 50 µL for analysis.

Note: Sample dilution factor: 2, detection limit: 0.05 ppb

Assay procedure

Restore all reagents and samples to room temperature (25°C) before use. All the reagents should be mixed thoroughly by gently swirling before pipetting. Avoid foaming. The unused ELISA Microtiter plate should be sealed as soon as possible and stored at 2-8°C.

1. **Number:** Number the sample and standard in order (multiple well), and keep a record of standard wells and sample wells. **Standard and Samples need test in duplicate**
2. **Add Sample:** add 50 µL of **Standard** or **Sample** per well, then add 50 µL **Antibody Working Solution**, cover the plate with plate sealer. Oscillate for 5 s gently to mix thoroughly. Incubate at 25°C for 30 min in shading light.
3. **Wash:** uncover the sealer carefully, remove the liquid in each well. Immediately add 300 µL of **Wash Buffer** (Solution 5) to each well and immerse for 30 s each time. Repeat wash procedure for 5 times, 30 s intervals/time. Invert the plate and pat it against thick clean absorbent paper (If bubbles exist in the wells, clean tips can be used to prick them).
4. **HRP Conjugate:** add 100 µL of **HRP conjugate** to each well. Incubate at 25°C for 30 min in shading light.
5. **Wash:** repeat Step 3.
6. **Color Development:** add 50 µL of **Substrate Reagent A** to each well, and then add 50 µL of **Substrate Reagent B**. Gently oscillate for 5 s to mix thoroughly. Incubate at 25°C in for 15 min shading light (The reaction time can be extended according to the actual color change).
7. **Stop Reaction:** add 50 µL of **Stop Solution** to each well, oscillate gently to mix thoroughly.
8. **OD Measurement:** determine the optical density (OD value) of each well at 450 nm (reference wavelength 630 nm) with a microplate reader. This step should be finished in 10 min after stop reaction.

Result analysis

1. Absorbance (%)= $A/A_0 \times 100\%$

A: Average absorbance of standard or sample

A_0 : Average absorbance of 0 ppb Standard

2. Drawing and calculation of standard curve

Create a standard curve by plotting the absorbance percentage of each standard on the y-axis against the log concentration on the x-axis to draw a semi-logarithmic plot. Add average absorbance value of sample to standard curve to get corresponding concentration. **If samples have been diluted, the concentration calculated from the standard curve must be multiplied by the dilution factor.**

For this kit, it is more convenient to use professional analysis form for accurate and fast analysis on a large number of samples.

Chloramphenicol (E-FS-E044) Standard Curve

