

# Fetal Bovine Serum Product

## Instructions

### I. Product Name

Chinese name: Fetal bovine serum

English name: Fetal Bovine Serum (FBS)

Product Grade: Premium Grade / Characterized Grade / Standard Grade

Application areas: conventional cell culture, tumor cells, certain stem cells and primary cells, viral packaging, as well as vaccine and biologics development.

### II. Product Overview

FBS is prepared from the blood of healthy, quarantine-approved fetal cattle through low-temperature separation, multi-stage centrifugation, continuous sterilization filtration, and batch quality control. This product is rich in natural growth factors, adhesion factors, hormones, amino acids, vitamins, trace elements, and a protein-based nutritional system essential for cell growth, effectively promoting cell adhesion, proliferation, and survival, making it a core foundational additive for in vitro cell culture.

This product is manufactured through a fully sterile process, free from exogenous contamination, and exhibits high batch stability, making it suitable for both research-grade and industrial-grade cell culture systems.

### III. Product Characteristics and Physicochemical Properties

Appearance: A pale yellow, clear and transparent, slightly viscous liquid with no hemolysis, no turbidity, and no visible impurities.

pH: 7.0–8.5

Total protein content: 30–45 (g/L)

Hemoglobin:  $\leq 200$  (mg/L)

Osmotic pressure: 250–330 mOsmol/kg

### IV. Quality Control Testing Standards

Aseptic testing: Negative for bacterial and fungal cultures, with no contamination by miscellaneous microorganisms

Mycoplasma detection: Negative (culture method)

Bacterial endotoxin:  $\leq 10$  EU/mL

Exogenous virus detection: No contamination by common exogenous viruses such as BVDV, BPV, PI3, Reo-3, BAV-3, or Rabies virus was detected.

Cell proliferation characteristics: Batch cell adhesion rate, doubling time, and colony formation rate remain stable, making it suitable for continuous subculture of various cell lines.

## V. Product Specifications

Standard specifications: 500 mL, 20 mL (sample)

Packaging forms: sterile PET culture medium bottles, individual sterile packages.

## VI. Scope of Application

- ① Routine culture, subculture, and preservation of various mammalian cell lines
- ② Isolation and culture of primary cells, expansion culture of stem cells
- ③ Cultivation of tumor cells, immune cells, and engineered cell lines such as CHO/293
- ④ Virus packaging, cell transfection, drug screening, and biologics development experiments
- ⑤ Preparation of cell cryopreservation solution and complete culture medium

## VII. Usage Instructions

### 1. Thawing Procedure

- ① Adhering to the gradient thawing principle effectively reduces protein precipitation and ensures serum activity.
- ② Remove from  $-20^{\circ}\text{C}$  and first place in a  $4^{\circ}\text{C}$  refrigerator overnight for thawing.
- ③ Leave at room temperature until fully dissolved the next day, gently shaking and mixing every 2–3 hours during this period.
- ④ Direct rapid thawing at room temperature, with hot water, or in a water bath is prohibited to prevent protein denaturation and precipitation.

### 2. Use the specified ratio

Conventional cell culture: Add 10% FBS to the culture medium.

Original cells/stem cells/fragile cells: can be adjusted to 12%–15%;

Partial high-density culture and recovery culture can temporarily increase the serum proportion.

### 3. Heat Inactivation Instructions (optional)

Conventional cell culture does not require heat inactivation; for immunology-related experiments or complement-sensitive cells, heat inactivation at 56°C for 30 minutes may be employed.

## VIII. Storage Conditions and Shelf Life

**Long-term storage: stored frozen at -20°C or below, with a shelf life of 5 years.**

Short-term storage: Can be stored at 4°C for up to 1 month.

Storage after thawing: Store at 4°C; use within 2 weeks. Avoid repeated freeze-thaw cycles.

Prohibited: Long-term storage at room temperature, repeated freeze-thaw cycles, direct sunlight exposure

## IX. Precautions

- ① This product is a sterile biological reagent, and all operations involving opening the container must be performed within a laminar flow hood to prevent contamination.
- ② The presence of small amounts of fine protein precipitates in serum is a normal phenomenon and does not affect its usability; it can be collected after low-speed centrifugation.
- ③ It is strictly prohibited to mix sera from different batches for critical control experiments; it is recommended to conduct system experiments using sera from a single batch.
- ④ If turbidity, significant sedimentation, discoloration, or abnormal odor occurs, continued use is prohibited.
- ⑤ Wear gloves and a mask during operation to avoid direct contact with skin and mucous membranes.

## X. Safety Instructions

This product is intended solely for scientific research purposes and must not be used for human administration, clinical injection, or addition to food or pharmaceutical products. Waste shall be disposed of in accordance with the specifications for biological laboratory waste.

## XI. Batch Traceability

Each batch of products includes: a batch test report, enabling full batch quality traceability.