



## Fetal Bovine Serum (FBS) Q&A

### 1. How should serum be properly stored?

- Serum should be stored at  $-20^{\circ}\text{C}$ , with a shelf life of up to 5 years.
- After thawing, it can be stored at  $2-8^{\circ}\text{C}$  for 2-4 weeks.
- If the thawed serum is to be used for a longer period, more than 4 weeks, it is recommended to aliquot it into suitable volumes and refreeze. You may also consider ordering our 50ml FBS packaging.

### 2. How should serum be properly thawed?

- The frozen serum can be transferred to  $2-8^{\circ}\text{C}$  and then gradually thawed to room temperature.
- During thawing, gently shake the serum to mix it evenly, avoiding excessive bubbles and minimizing precipitate formation.
- It is not recommended to thaw serum directly at  $37^{\circ}\text{C}$  or higher, as this can cause protein aggregation or denaturation, leading to precipitation.
- Repeated freeze-thaw cycles can lead to increased precipitation, so it is recommended to aliquot newly purchased serum for storage and reduce the number of thaw cycles.

### 3. What causes precipitates in serum?

- Heat inactivation treatment.
- Gamma irradiation.
- Thawing at room temperature or in a  $37^{\circ}\text{C}$  water bath.
- Long-term storage at  $2-8^{\circ}\text{C}$ .
- Uneven mixing during thawing.
- Repeated freeze-thaw cycles.

### 4. What is the precipitate in the serum and how can it be removed?

- The most common precipitates are fibrinogen (flocculent precipitate), lipoproteins, calcium phosphate, cholesterol, fatty acids, and some other proteins. These do not affect the serum quality and generally do not require any treatment.
- If you need to remove the flocculent precipitate, aliquot the serum into sterile centrifuge tubes and centrifuge at 500-1000g for 5-10 minutes. Then, collect the supernatant, prepare it into a complete culture medium, and filter before use.

### 5. What is gamma-irradiated serum?

- It is regular serum that has been exposed to a cobalt-60 source at a dosage of 25-35 kGy after sterile filtration.

- As one of the most effective methods for virus inactivation, gamma irradiation further reduces the potential for microbial contamination and minimizes risks related to animal-derived components.

- Gamma irradiation does not alter the serum 's physicochemical properties or its performance in cell culture.

#### **6. What is the role of heat inactivation of serum? Is it necessary?**

- Heat inactivation involves fully thawed serum being mixed well and then placed in a 56° C water bath for 30 minutes.

- Heating inactivates complement proteins and is useful for immunological research, including culturing embryonic stem cells (ESCs), insect cells, and smooth muscle cells.

- For most cells, heat inactivation is unnecessary and may cause loss of some nutrients, negatively affecting serum quality and reducing cell growth rate.

- High-temperature treatment can cause protein aggregation, increasing precipitation. Therefore, heat inactivation is not needed unless specifically required for the experiment.

#### **7. How can the impact of batch-to-batch variation in serum be minimized?**

- It is recommended to use the same batch of serum within the same research project or experiment.

- Strictly control operational conditions to maintain consistency, including culture conditions and medium formulations.

- Test and verify each new batch of serum to ensure its suitability for the specific cell type and application.

- Record the usage and experimental results of each serum batch, analyze any differences between batches, and optimize experimental design and serum selection accordingly.