

# Technical Data Sheet

## Albumin Fraction V (pH 7.0) low endotoxin

for cell biology

Order number: 4240

Albumin Fraction V, also named Bovine Serum Albumin (BSA, bovine albumin), is a protein extracted from bovine blood plasma. The designation "Fraction V" is based on Cohn's extraction method, which takes advantage of the different solubility behavior of the proteins in the blood plasma. In the separation of plasma proteins performed according to Cohn, BSA represents the fifth fraction. BSA shows a net negative charge under physiological conditions and is a small (~67 kDa), stable protein.

In blood, BSA regulates colloid osmotic pressure and acts as a transport protein for 2-valent cations ( $\text{Zn}^{2+}$ ,  $\text{Cu}^{2+}$ ). In addition, bovine albumin shows high affinity for polar (water, salts) and nonpolar substances (e.g. fatty acids, hormones). It is also able to bind toxic and pyrogenic substances, making it a valuable additive in cell culture media. BSA is also the main component of fetal calf serum (FBS). However, BSA is not a substitute for FBS because the numerous components of FBS in their complex properties cannot be replaced by a single protein.

Albumin Fraction V is available in different grades suitable for different applications depending on their properties/parameters. Based on the extraction and purification process that is used, the final BSA product will show differences in purity and amount of traces of enzymes, metabolites, peptides, fatty acids, etc.

### Applications

The applications of BSA are extremely diverse. It is a common additive in cell culture media and solutions (as growth factor, stabilizer, detoxifier) and an essential component in a wide variety of biochemical and immunological applications.

Since BSA is a non-reactive protein, it is often used as a blocking agent in immunohistochemistry (Western blotting, ELISA). In this process, BSA binds non-specifically to all free binding sites, allowing specific coupling of the antibody to target antigens. The ability of BSA to "saturate" surfaces is also used to prevent enzymes from attaching to vessel walls and pipette tips.

In biochemical and molecular biology laboratories, BSA is added to various dilution and storage buffers to stabilize isolated proteins/enzymes/antibodies (prevention of proteolysis and denaturation).

Due to its good binding properties, BSA can also be used for the solubilization of hydrophobic macromolecules such as lipids, or sensitive enzymes.



Furthermore, BSA is the most frequently used protein standard for the determination of unknown protein concentrations (Bradford assay, BCA assay, Lowry assay).

Other uses for BSA include in vitro transport and binding studies and the use of BSA as a carrier in protein conjugates for the generation of antibodies against small peptides.

The reason why BSA is used as the norm in so many applications and research areas is not just its properties. Because BSA is a by-product of the food industry, it is available in large quantities and is inexpensive.

### Preparation of a solution

For blocking in immunological assays, usually a 2 - 5% BSA solution in PBS or TBS (with or without Tween 20) is used.

In cell culture, BSA is commonly applied at a final concentration of 1%. BSA should not be added directly to the medium, but first prepared as a sterile filtered stock solution in water or PBS. BSA solutions (up to 30 % in deionized water) are clear to slightly turbid and virtually free of particles.

### Storage and Stability

Albumin Fraction V should be stored at 2 - 8°C and in a dry place. The freeze-dried powder has a shelf life of at least 3 years when stored properly. Shipment is made at room temperature.

After reconstitution, the solution can be stored for up to one week at 4°C. For long-term storage of BSA solutions, we recommend storage at -20°C in aliquots.

BSA tends to coagulate in solution and form hydrophobic aggregates. This already occurs to a small extent at low temperatures but is considerably enhanced by heating. Since this process is irreversible, heating of BSA solutions must be avoided.

### Related products

1229	Sodium hydrogen carbonate for cell biology
1500	Water sterile for cell biology
1175	D-PBS (10X) powder mixture w/o Ca and Mg for cell biology
1346	D-PBS (1X) powder mixture w/o Ca and Mg for cell biology
1444	Trypsin (0.05 %) - EDTA (0.02 %) solution in HBSS w/o Ca and Mg, with Phenol red
1510	Penicillin/Streptomycin solution (10000 U/ml) for cell biology
4045	Gentamycin sulfate solution (50 mg/ml) for cell biology
5685	Amphotericin B solution (250 µg/ml) for cell biology
2095	Fetal Calf Serum (FBS, origin South America) standard quality for cell biology

