









SERUM

LEGEND

State:  Liquid  Powder  Frozen

Storage and shipping conditions:  Room Temperature  +8°C  +2°C  -20°C

Shelf life, in months:  24 m

About serum

Traceable to the Source

When scientists select their sera, an important factor taken into consideration is the source. Therefore, traceability of the serum is of paramount importance.

Biowest Fetal Bovine Serum is derived from clotted whole blood, aseptically collected from bovine foetuses via cardiac puncture. Each manufactured batch is rigorously controlled, from the collection of the serum and throughout all stages of its treatment and production, through to final packaging on our premises. The product is analyzed, classified, and tested by Biowest before shipped to customers all over the world.

Our Quality System can trace raw materials back to the original supplier and slaughterhouse where they were collected. Biowest's system of vertical integration provides certainty of origin and traceability of all Sera.

Biowest Quality

FBS "quality" is defined in relation to growth promotion characteristics of a specific cell line when cultured in our sera. A batch of FBS which works well for one cell line may not work well for another cell line. Biowest customers can purchase FBS after performance-testing of a sample. There are thousands of different cell lines and no two batches of FBS are identical ; we therefore offer a Sample and Reserve policy. Each batch is delivered with a Certificate of Analysis.

Serum - Batch Reservations

Biowest is pleased to provide free samples of different batches combined with batch reservations during the test period, for up to 4 to 6 weeks. The general sample size for FBS is 50 ml / batch.

After batch testing, the reservation must be confirmed with a first order.

For customers who do not have ample storage facilities, we can store the reserved batch up to 12 months, combined with scheduled shipments.

Technical Support

Biowest's experienced Technical Service Staff is available to answer questions regarding our quality control and all Biowest products.

> We aim to provide timely, courteous and professional service.

Worldwide Sourcing

Biowest offers a wide range of sources from countries with excellent veterinary status. This includes sources from South America, as well as European Union (EU) and United States Department of Agriculture (USDA) approved sources. The choice of the FBS source is determined by import requirements and available supply for the different markets.

Biowest is the ideal partner for academic researchers and biopharmaceutical companies who select FBS based on origin and performance.

European Directorate for the Quality of Medicines

EDQM certified FBS is your guarantee that the origin and the manufacturing process of the product have been certified by the European Directorate for the Quality of Medicines & HealthCare. The EDQM protects and promotes public and animal health in Europe. Its mission is to contribute to the basic

human right of access to good quality medicines and healthcare, and to promote and protect human and animal health, by establishing and providing official standards for the manufacture and quality control of medicines valid in all the signatory states of the Convention for the Elaboration of a European Pharmacopoeia.

Biowest can provide sterile filtration and packaging of serum in its own facility that meets the criteria described in the current version of the product monograph, without the risk of transmitting agents of animal spongiform encephalopathies, n° 1483 of the European Pharmacopoeia. This is certified by the EDQM.

The countries of origin of EDQM certified FBS are Panama, Costa Rica, Uruguay, Paraguay, Brazil, Chile, Mexico, France, Columbia, USA. We are also EDQM certified calf serum from France.

Filtration and Packaging

Raw pooled serum is filtered, through a triple series of 0.1 micron, sterilizing filters for FBS for example. The sterile serum is true-pooled to ensure homogeneity.

Biowest products are packaged via an aseptic filling process for which each step has been carried out to ensure the production of a product meeting the industry sterility standard assurance level of 10^{-4} (i.e., product that demonstrates a bacterial and fungal contamination level of no more than 1 of 10,000 units during the manufacturing process). The highest level of sterility assurance ($\geq 10^{-6}$) cannot be achieved without terminal sterilization. Filtration and dispensing are performed within positive pressure, HEPA-filtered, environmentally controlled rooms.

> **FBS Final Filter Size : Triple 0.1 micron**

Sterility

All sera are tested for the absence of aerobic and anaerobic bacteria, fungi and yeast.

The sterility test procedure is based on the European Pharmacopoeia or US Pharmacopoeia depending on the location of final filtration.

Products are dispensed via an aseptic process to ensure that all Biowest products achieve the highest Sterility Assurance Level. A representative number of samples from each production batch is selected for Sterility testing.

Mycoplasma

Each final product batch is tested for the absence of mycoplasma. The sera are tested for the absence of Mycoplasma utilizing a cell culture assay in Axcell Biotechnologies media by culture method. Our test is accurate within the limits of the detection method used.



Virus Testing

Each batch of serum is tested for adventitious viruses using cell culture techniques.

The serum is tested for:

- Bovine Viral Diarrhoea (BVD)
- Infectious Bovine Rhinotracheitis (IBR)
- Parainfluenza Type 3 (PI3)

Sera are tested for the absence of the indicated viruses by inoculation with GBK cells. The detection of virus is made by indirect immunofluorescence.

Antibody Testing : presence of specific antibodies is detected utilizing an ELISA Assay. The serum from equidea is tested for the presence of Equine Infectious Anemia antibodies.

Cell Culture Testing

Each batch of serum is tested for its ability to support in vitro growth of specific cell lines. Therefore, in addition to verifying that each batch of sera passes our exacting quality control specifications, three important performance criteria are evaluated in our Quality Control Program :

- Growth Promotion
- Cloning Efficiency
- Plating Efficiency

Biological performance is assessed using cell culture medium supplemented with a final concentration of 10% serum. During the test period, cultures are examined microscopically for any morphological abnormalities that may indicate toxic components in the serum.

The following cell lines are utilized to determine growth promotion and functionality :

Cell Line	Type	Species
HELA	Cancer	Human
L929	Fibroblast, Macrophage	Mouse
SP2/0-AG14	Lymphoma	Mouse
MRC-5	Lung	Human

Haemoglobin

A quantitative and colorimetric assay is performed to determine the residual haemoglobin concentration in each product batch.

Endotoxin Test (LAL)

All sera are tested to determine and quantify endotoxin levels. Biowest conducts a chromokinetic (quantitative test) method D of the European Pharmacopoeia.

Total Protein

Protein detection	Methodology
Protein	Biuret Colorimetry
Albumin	Immunoturbidimetry
Globulin	Immunoturbidimetry

Osmolality

Osmolality is determined by a lowered freezing temperature. The osmometer is calibrated using traceable standards.

pH

All pH meters are calibrated daily with standard solutions.

Bovine Spongiform Encephalopathy (BSE) Testing

According to the European Regulation EC n° 999/2001, animals are tested for BSE before the corresponding blood is allowed to be processed. The EU is pioneer in BSE testing and individual identification of animals through ear tagging, which ensures the best possible traceability and the lowest BSE risk and makes the EU origin the first choice of researchers in Japan and other selective markets.

Test	Prionics	Bio-Rad
Method	Western Blot	ELISA

Chemical and Enzyme Profile

Test	Method
Sodium	Indirect Potentiometry
Potassium	Indirect Potentiometry
Chloride	Indirect Potentiometry
Calcium	Arsénazo Colorimetry
Phosphorus	Phosphomolybdate Colorimetry
Alkaline Phosphatase	Colorimetric Kinetic at 37°C
LDH	UV Kinetic at 37°C
SGOT	UV Kinetic at 37°C
SGPT	UV Kinetic at 37°C
Gamma Globulin	Colorimetric Kinetic at 37°C
Cholesterol	Cholesterase Trinder Colorimetry
Bilirubin	DPD / caffeine colorimetry
Glucose	Hexokinase UV
Urea	Urease UV
Creatinine	Colorimetric Kinetic (Jaffé)
Triglycerides	Glycerokinase Trinder Colorimetry
Iron	TPTZ Colorimetry

Storage

All Biowest products have labels indicating storage conditions, batch number, and expiry date.

Optimal product performance is guaranteed, when the product is stored properly. Animal Sera and Plasma are stored at -20°C.

Expiration Date

The shelf life for animal Serum is 60 months, and for animal plasma 48 months.


Intended Use

These products are intended for research applications. It is the end user's responsibility to qualify these products for their specific application.

These products are not for diagnostic use. The safety and efficacy of these products in diagnostic or other clinical uses have not been established.

FETAL BOVINE SERUM - FBS

FBS South America

Cat N° :	S1810-100 S1810-500	Unit/Size :	100 ml 500 ml		 -20°C	 60 m
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
FBS France

Cat N° :	S1820-100 S1820-500	Unit/Size :	100 ml 500 ml		 -20°C	 60 m
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FBS Ireland

Cat N° :	S1780-100 S1780-500	Unit/Size :	100 ml 500 ml		 -20°C	 60 m
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


FBS USA

Cat N° :	S1520-100 S1520-500	Unit/Size :	100 ml 500 ml		 -20°C	 60 m
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FBS Mexico, USDA approved

Cat N° :	S1650-100 S1650-500	Unit/Size :	100 ml 500 ml		 -20°C	 60 m
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FBS Central America, USDA approved

Cat N° :	S1600-100 S1600-500	Unit/Size :	100 ml 500 ml		 -20°C	 60 m
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FBS Chile, USDA approved

Cat N° :	S1560-100 S1560-500	Unit/Size :	100 ml 500 ml		 -20°C	 60 m
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FBS Japan approved

Cat N° :	S1530-100 S1530-500	Unit/Size :	100 ml 500 ml		 -20°C	 60 m
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FBS Uruguay

Cat N° :	S1580-100 S1580-500	Unit/Size :	100 ml 500 ml		 -20°C	 60 m
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FBS South Africa

Cat N° :	S1300-100 S1300-500	Unit/Size :	100 ml 500 ml		 -20°C	 60 m
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HIGHEST QUALITY FETAL BOVINE SERUM - FBS

FBS PREMIUM

By using FBS Premium, our customers save time in their daily work: they avoid time consuming batch testing. FBS Premium is a collection of high quality batches, selected on excellent and defined values for essential data:

- Endotoxin level < 5 EU/ml
- Hemoglobin level < 25 mg/100 ml
- Growth promotion > 80% guaranteed **

By respecting those criteria, we ensure you a low batch-to-batch variation.

Avoid losing time in batch testing, use FBS Premium.

FBS South America, Premium

Cat N° :	S181B-100 S181B-500	Unit/Size :	100 ml 500 ml		 -20°C	 60m
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* see page 10

** on 4 Cell lines : SP2/O-Ag14, HELA, L929 and MRC-5

FBS ULTRA LOW

FBS Ultra has a guaranteed endotoxin level of < 0.1 EU/mL and is appropriate to be used for most sensitive cell cultures or other applications that could be disturbed by high endotoxin levels. It has the same high quality standards like our other sera and is triple 0.1µm Filtered and tested for Virus & Mycoplasma.

FBS South America, Ultra-low Endotoxin

Cat N° :	S1860-100 S1860-500	Unit/Size :	100 ml 500 ml		 -20°C	 60m
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- Other packaging available on request.

SPECIALITY FETAL BOVINE SERUM

Heat Inactivation (56°C-30 mn)

This treatment destroys 'complement' and thus avoids interference with some experimentation, in particular immunology tests. It also inactivates viruses and destroys some bacterial contaminants such as the mycoplasma.

FBS South America, Heat inactivated

Cat N° :	S181H-100 S181H-500	Unit/Size :	100 ml 500 ml		 -20°C	 60m
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- **To order this treatment for any other serum using code H**
please replace the last number of its Cat N° by the letter H

Gamma Irradiation

Gamma irradiated serum minimizes the risk associated with the use of animal products and offers protection against low levels of microbial contaminants. The treatment inactivates viruses of potential concern, such as foot and mouth disease, vesicular stomatitis, rinderpest, peste des petits ruminants, Rift valley fever, bluetongue... while maintaining growth promotion potential. The serum is gamma irradiated on a regular basis at 25 kGy and other doses are available upon request.

FBS South America, Gamma Irradiated

Cat N° :	S181G-100 S181G-500	Unit/Size :	100 ml 500 ml		 -20°C	 60m
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- **To order this treatment for any other serum using code G**
Please replace the last number of its Cat N° by the letter G

Charcoal stripping :

Biowest offers Charcoal / Dextran stripped Fetal Bovine serum for researchers requiring low levels of hormones. Charcoal / Dextran stripping reduces the concentration of steroid hormones in Serum such as estradiol, progesterone, cortisol, testosterone, T3 and T4. This Serum is usefull where the endogenous molecules may interfere with experimental research. This serum may show some reduced growth promotion ability for cells requiring the presence of certain hormones (Biblio: Northbio).

FBS South America, Charcoal stripped

Cat N° :	S181F-100 S181F-500	Unit/Size :	100 ml 500 ml		 -20°C	 60m
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- **To order this treatment for any other serum using code F**
please replace the last number of its Cat N° by the letter F



Dialysation :

The dialysis reduces the concentration of free low molecular weight components such as nucleotides, amino acids, hormones and ions. We use a dynamic filtration method to produce our dialysed serum. The sera are dialysed using a 10 000 molecular weight cut-off membrane.

FBS South America, Dialysed

Cat N° :	S181D-100 S181D-500	Unit/Size :	100 ml 500 ml
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● **To order this treatment for any other serum using code D** please replace the last number of its Cat N° by the letter D

Lipid depletion :

Biowest uses the fumed silica precipitation method for removing lipids. The fumed silica powder is added to the serum. It's well mixed together, after which the solution is centrifuged. The supernatant contains the serum and the lipids are with the silica in the pellet.

FBS South America, Lipid Depleted

Cat N° :	S181L-100 S181L-500	Unit/Size :	100 ml 500 ml
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● **To order this treatment for any other serum using code L** please replace the last number of its Cat N° by the letter L

Iron supplementation :

A 1% Ferric citrate sterile solution is added to the serum at 0,246% (v/v). Then the serum is well mixed. Transferrin is normally 20 to 40 % bound to iron.

FBS South America, Iron Supplemented

Cat N° :	S181R-100 S181R-500	Unit/Size :	100 ml 500 ml
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● **To order this treatment for any other serum using code R** please replace the last number of its Cat N° by the letter R



Exosome depletion

Exosome depleted serum is treated with our proprietary ultrafiltration method. This treatment depletes the microvesicles naturally present in the serum. Biowest guarantees at least $\geq 95\%$ depletion of exosome.

FBS South America, Exosome Depleted


Cat N° :	S181M-100 S181M-500	Unit/Size :	100 ml 500 ml		 -20°C	 60m
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● **To order this treatment for any other serum using code M**
please replace the last number of its Cat N° by the letter M

Tetracycline Free

The serum is tested for the presence of Chlorotetracycline, Oxytetracycline and Tetracycline by a liquid chromatography electrospray ionisation tandem mass spectrometry method. The detection limit is < 0.05 mg/l

FBS South America, Tetracycline Free

Cat N° :	S181T-100 S181T-500	Unit/Size :	100 ml 500 ml		 -20°C	 60m
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● **To order this treatment for any other serum using code T**
please replace the last number of its Cat N° by the letter T

Embryonic Stem Cells

The serum is tested to confirm a high growth factor content. The cell growth is studied during two passages with mouse embryonic stem cell E14 cell line. The validation criteria are the cell growth and the perfect morphology of the cells.

FBS South America, Embryonic Stem Cells tested

Cat N° :	S181S-100 S181S-500	Unit/Size :	100 ml 500 ml		 -20°C	 60m
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● **To order this treatment for any other serum using code S**
please replace the last number of its Cat N° by the letter S

BOVINE SERUM ALBUMIN - BSA

Bovine serum albumin (BSA) is commonly used in cell culture protocols, particularly where protein supplementation is necessary and the other components of serum are unwanted. In cell culture, its main role is as a carrier of small molecules. Because of its negative charge, BSA binds water, salts, fatty acids, vitamins and hormones, then carries these bound components between tissues and cells. The binding capacity also makes BSA an effective scavenger to remove toxic substances, including pyrogens, from the medium.

Albumins are readily soluble in water and can only be precipitated by high concentrations of neutral salts such as ammonium sulfate. The solution stability of BSA is very good (especially if the solutions are stored as frozen aliquots). Albumins are frequently used as stabilizers for other solubilized proteins (e.g., labile enzymes). However, albumin is readily coagulated by heat. When heated to 50°C or above, albumin quite rapidly forms hydrophobic aggregates which do not revert to monomers upon cooling. At somewhat lower temperatures, aggregation is also expected to occur, but at relatively slower rates.

Albumin is used to solubilize lipids, and is also used as a blocking agent in Western blots or ELISA applications.

Bovine Serum Albumin Lyophilised pH ~7

Cat N° :	P6154-100GR P6154-500GR P6154-KG	Unit/Size :	100 g 500 g 1 Kg			
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Bovine Serum Albumin Protease Free

Cat N° :	P6155-100GR P6155-500GR P6155-KG	Unit/Size :	100 g 500 g 1 Kg			
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Bovine Serum Albumin Fatty Acids Free

Cat N° :	P6156-100GR P6156-500GR P6156-KG	Unit/Size :	100 g 500 g 1 Kg			
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Bovine Serum Albumin 30 % liquid

Cat N° :	A0296-1000	Unit/Size :	1000 ml			
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- Other species available on request
- BSA charcoal stripped available on request

ANIMAL SERUM

> All Animal sera can be treated, please inquire about the possibilities

- Other species available on request.
- Other packaging available on request.

Bovine Serum (France Origin)

Cat N° :	S0250-100 S0250-500	Unit/Size :	100 ml 500 ml		 -20°C	 60m
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
Calf Serum

Cat N° :	S0400-500	Unit/Size :	500 ml		 -20°C	 60m
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New Born Calf Serum

Cat N° :	S0750-500	Unit/Size :	500 ml		 -20°C	 60m
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Horse Serum

Cat N° :	S0910-500	Unit/Size :	500 ml		 -20°C	 60m
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Donor Horse Serum

Cat N° :	S0900-500	Unit/Size :	500 ml		 -20°C	 60m
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Donor Foal Serum

Cat N° :	S0800-500	Unit/Size :	500 ml		 -20°C	 60m
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Donkey Serum

Cat N° :	S2170-500	Unit/Size :	500 ml		 -20°C	 60m
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

Goat Serum

Cat N° :	S2000-500	Unit/Size :	500 ml		 -20°C	 60m
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Lamb Serum

Cat N° :	S2300-500	Unit/Size :	500 ml		 -20°C	 60m
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Sheep Serum

Cat N° :	S2350-500	Unit/Size :	500 ml		 -20°C	 60m
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Pig Serum

Cat N° :	S2400-500	Unit/Size :	500 ml		 -20°C	 60m
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Chicken Serum

Cat N° :	S0500-500	Unit/Size :	500 ml		 -20°C	 60m
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Rabbit Serum

Cat N° :	S2500-500	Unit/Size :	500 ml		 -20°C	 60m
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Rat Serum

Cat N° :	S2150-050 S2150-100 S2150-500	Unit/Size :	50 ml 100 ml 500 ml		 -20°C	 60m
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Mouse Serum

Cat N° :	S2160-050 S2160-100 S2160-500	Unit/Size :	50 ml 100 ml 500 ml		 -20°C	 60m
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Guinea Pig Serum

Cat N° :	S2450-010 S2450-100	Unit/Size :	10 ml 100 ml		 -20°C	 60 m
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ANIMAL PLASMA

Bovine Plasma w/ Sodium Citrate

Cat N° :	S0260-500	Unit/Size :	500 ml		 -20°C	 48 m
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Rat Plasma w/ Lithium Heparin

Cat N° :	S2140-100	Unit/Size :	100 ml		 -20°C	 48 m
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Mouse Plasma w/ Lithium Heparin

Cat N° :	S2162-100	Unit/Size :	100 ml		 -20°C	 48 m
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- Other species available on request.
- Other packaging available on request.


HUMAN SERUM, PLASMA & ALBUMIN

The **human serum** «off-the-clot» is processed from human blood that has had coagulation induced. It is collected from volunteer donors. Each batch is rigorously controlled and screened for Hepatitis B (HBS), Hepatitis C (HCV) and HIV Type 1 and 2 (HIV1/2).

Our **human sera** are mainly sourced in Europe and Canada.

- *Important : Products of human origin should be considered potentially infectious and handled accordingly.*



Human Serum AB male HIV tested

Cat N° :	S4190-100	Unit/Size :	100 ml		 -20°C	 60 m
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Human Serum HIV tested

Cat N° :	S4200-100	Unit/Size :	100 ml		 -20°C	 60 m
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Human Plasma pooled

Cat N° :	S4180-100 S4180-500	Unit/Size :	100 ml 500 ml		 -20°C	 48 m
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Human Serum Albumin

Cat N° :	P6140-100GR P6140-500GR P6140-KG	Unit/Size :	100 g 500 g 1 kg		 +8°C +2°C	 48 m
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> Human Serum is available with treatments. Please contact us so we can make your custom made product on request.