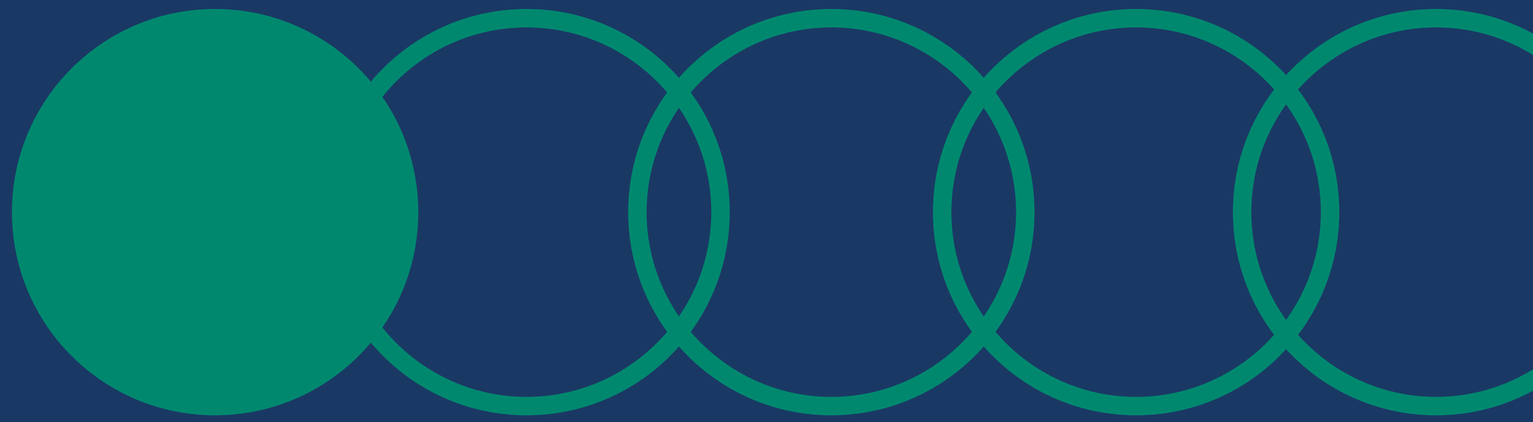
Quality.
Consistency.
Reliability.

Fuel your work with
HyClone™ cell culture serum



cytiva

HyClone™ Cell culture serum

Defining consistent quality

You need a consistent supply of high-quality materials to fuel your cell culture work. We provide a strong security of supply program with our global manufacturing and distribution footprint. Our diversified serum supply network bolsters this strength for serum products.

For decades, HyClone™ serum products have been known for their quality and regulatory compliance. Our filtration techniques reduce contaminants without impacting cell performance. The collection and processing procedures ensure the serum product offers reproducible and dependable results.

With an active role in emerging markets, including new human vaccines, we are positioned to provide consistent, high-performance cell culture products – including fetal bovine serum (FBS), calf serum, or other animal-origin serum products – to enable advances in life science research.

High-quality FBS

Serum collection

From collection to final packaging, every step is documented for a consistent high-quality product with minimal risk of contamination. Our serum products have full traceability back to the original source and are compliant with current good manufacturing practices (cGMP).

Quick and reliable processing

Finished products undergo extensive quality, performance, and analytical testing. Goods are aseptically packaged into gamma irradiated plastic bottles in a Class 100 cleanroom environment.

Quality control testing and standards

Each serum lot is tested to ensure quality and sterility. Low endotoxin and hemoglobin levels reflect the care with which the serum is collected and processed.

Industry-leading traceability program gives peace of mind

Origin of sera is important. As proof that we ensure proper origin, traceability, and truth in labeling, we are traceability certified by the International Serum Industry Association (ISIA).

In addition, we go beyond industry standards of document traceability by performing independent testing by Oritain on each batch of Characterized and Defined FBS from the United States, Australia, and New Zealand. Look out for the Oritain™ logo on your FBS bottle.

Animal serum origins

Serum origin refers to the country in which the raw blood was collected. It's not to be confused with the country in which the finished product was processed. With HyClone serum products, the country or countries of origin are stated in the certificate of analysis that you receive with your product.

The supply of FBS, a byproduct of the beef industry, is impacted by complex market conditions. For these reasons, we ensure adequate supply for our customers by not only sourcing FBS from several regions, but also working with a broad base of serum and raw blood suppliers. To ensure traceability and security of supply, raw serum is obtained in New Zealand, Australia, the Americas, Canada, Mexico, Central America, and South America. Moreover, we are traceability certified by the International Serum Industry Association (ISIA) and send samples of characterized and defined FBS to Oritain for independent testing.

New Zealand

The great expanse of the Pacific Ocean has protected New Zealand from many outside influences, both geographically and biologically. One of the benefits of this isolation is that New Zealand has the fewest reported bovine diseases in the world, making it an excellent source of bovine serum. HyClone Characterized and Defined FBS, New Zealand Origin is carefully collected, processed, and filtered at our in-country facility.

Australia

HyClone Characterized and Defined FBS, Australian Origin is sourced from Australian abattoirs approved by USDA for export and inspected by the Australian Department of Agriculture (DA). We have found that Australian methods of animal husbandry exhibit excellent animal nutrition and healthcare. As with New Zealand, Australia is isolated, thus making animal disease control and management easier than in most areas of the world.

United States

In-country processing of our United States (US) origin serum products is optimized for supply integrity, minimizing cross-contamination risks with other serum origins and types. Our US origin serum products include fetal bovine and bovine calf sera, as well as a variety of engineered or alternative species sera. Non-US origin products are manufactured in a separate facility, utilizing single-use technology to minimize risk of cross-contamination with other serum products.

USDA import tested

USDA tested fetal bovine serum is intended for low-risk applications. It is sourced from countries and regions where serum can be imported into the United States. These include North America, Central America, Australia, and New Zealand. The serum is safety tested by the United States Department of Agriculture (USDA) when required, and it's considered to be foot-and-mouth disease (FMD) free. HyClone USDA Import Tested FBS is processed and packaged in the United States. As with all HyClone products, the product label and Certificate of Analysis (CoA) includes the specific countries of origin used in each lot.

South America

HyClone FBS, South American Origin is typically sourced from Brazil and Uruguay. South American FBS complies with EU regulations and meets the requirements of most Asian countries. South American FBS is available only to European and Asian customers.

Canada

As with all HyClone sera products, Characterized Fetal Bovine Serum sourced in Canada provides important proteins, hormones, growth factors, metabolites, and nutrients essential for cell culture. Canadian-sourced FBS is processed in the US.

Innovative techniques to meet your demands

There are specific requirements for serum used in a variety of cell culture applications involved in modern biopharmaceutical research. Therefore, a number of processing methods are employed to yield a product suitable for specific applications.

Variability in serum components is natural and results from a variety of factors, such as age and geographical origin. To reduce this variability, each lot of serum is pooled after filtration and before dispensing to ensure uniformity and consistency between bottles (true pool processing). This increases the consistency and quality of our serum products.

Some treatments are used to remove adventitious agents, whereas other processes filter various natural serum constituents that can disrupt certain analytical techniques or assays. Based on our serum processing and application understanding, we have the ability to perform a number of tests to identify serum lots with characteristics that make them well-suited for specific cell lines and protocols.

Post-filtration treatments and additional testing

Gamma irradiation

Gamma irradiation is a powerful treatment to further reduce the risk of adventitious viruses present in serum. The irradiation process is validated to deliver a minimum dose of 25 kGy. If manufacturing products for use in humans or in animals, irradiation should be a routine requirement.

Heat inactivation

Exposing serum to a temperature of 56°C for 30 min is a common post-filtration process. Heat inactivation can be effective in reducing some adventitious agents and may be used in addition to, but never substituted for, gamma irradiation. Both services are available upon request.

EMA conforming tests

To support biopharmaceutical manufacturers selling product into Europe and utilizing bovine serum in their processes, the European Medicines Agency (EMA) conforming tests can be requested on HyClone serum products for an additional fee.

HyClone EMA conforming products are tested according to European Pharmacopoeia protocols and per request, irradiated at the required minimum dose. This testing provides our sera customers with the assurance of receiving a consistent, high-quality product that conforms to the EMA requirements.

The EMA has issued two directives that apply to the use of bovine serum in the production of medicinal products. Our EMA conforming products meet both directives

- EMEA/CVMP/743/00-rev 2 from the Committee for Veterinary Medicinal Products (CVMP) Guideline on requirements and controls applied to bovine serum used in the production of immunological veterinary medicinal products
- EMA/CHMP/BWP/457920/2012 rev.1 from the Committee for Proprietary Medicinal Products (CPMP) guideline on the use of bovine serum in the manufacture of human biological medicinal products

Complete versions of both directives can be found at ema.europa.eu/ema/.

Serum testing results

Description and origin	Product code	Filtration	Endotoxin (EU/mL)	Hemoglobin (mg/dL)	Osmolality (mOsm/Kg)	Total protein (g/dL)	Sterility bacteria and fungi testing	Fluorescent antibody testing	Cytopathogenic agents	Hemadsorbing agents	Mycoplasma	Protein testing	Trace metals / iron	Vitamins / hormones	Electrophoretic profile	IgG (µg/mL)
Fetal bovine serum																
Defined FBS, United States	SH30070	Serial 0.04 µm	≤ 5	≤ 15	•	•	•	•	•	•	•	•	•	•	•	•
Characterized FBS, United States	SH30071	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•		•	•
Standard FBS, United States	SH30088	Triple 0.1 µm	FIO	FIO	•	•	•	•	•	•	•	•	•		•	•
Defined FBS, New Zealand	SH31194	Serial 0.04 µm	≤ 5	≤ 15	•	•	•	•	•	•	•	•	•	•	•	•
Characterized FBS, New Zealand	SH30406	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•	•	•	•
Defined FBS, Australian	SH31195	Serial 0.04 µm	≤ 5	≤ 15	•	•	•	•	•	•	•	•	•	•	•	•
Characterized FBS, Australian	SH30084	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•		•	•
Characterized FBS, Canadian	SH30396	Triple 0.1 µm	≤ 25	≤ 25	•	•	•	•	•	•	•	•	•		•	•
Characterized FBS, USDA Tested	SH30910	Triple 0.1 µm	≤ 25	≤ 25	•	•	•	•	•	•	•	•	•		•	•
Research Grade FBS, South American	SV30160	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•			•

FIO = for information only
• = Tested. For typical results, request a certificate of analysis or go to cytiva.com/certificates
EMA conforming testing is available on all serum products for an additional charge
Testing procedures and results are compliant with EP2262

Serum testing results

Description and origin	Product code	Filtration	Endotoxin (EU/mL)	Hemoglobin (mg/dL)	Osmolality (mOsm/Kg)	Total protein (g/dL)	Sterility bacteria and fungi testing	Fluorescent antibody testing	Cytopathogenic agents	Hemadsorbing agents	Mycoplasma	Protein testing	Trace metals / iron	Vitamins / hormones	Electrophoretic profile	IgG (µg/mL)
Specialty fetal bovine serum																
Super Low IgG FBS, United States	SH30898	Serial 0.04 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•	•	•	•
Charcoal/Dextran Treated FBS, United States	SH30068	Triple 0.1 µm	≤ 10	≤ 20	•	•	•	•	•	•	•	•	•	•	•	•
Dialyzed FBS, United States	SH30079	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•	•	•	•
ES Cell Screened FBS, United States	SH30071E	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•		•	•
Tetracycline Screened FBS, United States	SH30071T	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•		•	•
Insect Cell Screened FBS, United States	SH30071I	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•		•	•
Human Mesenchymal Stem Cell Screened FBS, United States	SH30071M	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•		•	•

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Serum testing results

Description and origin	Product code	Filtration	Endotoxin (EU/mL)	Hemoglobin (mg/dL)	Osmolality (mOsm/Kg)	Total protein (g/dL)	Sterility bacteria and fungi testing	Fluorescent antibody testing	Cytopathogenic agents	Hemadsorbing agents	Mycoplasma	Protein testing	Trace metals / iron	Vitamins / hormones	Electrophoretic profile	IgG (µg/mL)
Bovine calf serum																
Bovine Calf Serum, United States	SH30073	Triple 0.1 µm	≤ 10	< 30	•	•	•	•	•	•	•	•	•		•	•
Iron Supplemented Bovine Calf Serum, United States	SH30072	Triple 0.1 µm	≤ 10	< 30	•	•	•	•	•	•	•	•	•		•	•
Iron Supplemented Newborn Serum, New Zealand	SH30626	Triple 0.1 µm	≤ 25	< 30	•	•	•	•	•	•	•	•	•		•	•
Cosmic Calf™ Serum, United States	SH30087	Triple 0.1 µm	≤ 10	< 30	•	•	•	•	•	•	•	•	•		•	•
Bovine Growth Serum, United States	SH30541	Triple 0.1 µm	≤ 10	< 30	•	•	•	•	•	•	•	•	•		•	•
Newborn Bovine Calf Serum, United States	SH30118	Triple 0.1 µm	≤ 50	≤ 30	•	•	•	•	•	•	•	•	•		•	•
Newborn Bovine Calf Serum, New Zealand	SH30401	Triple 0.1 µm	≤ 50	< 30	•	•	•	•	•	•	•	•	•		•	•

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Serum testing results

Description and origin	Product code	Filtration	Endotoxin (EU/mL)	Hemoglobin (mg/dL)	Osmolality (mOsm/Kg)	Total protein (g/dL)	Sterility bacteria and fungi testing	Fluorescent antibody testing	Cytopathogenic agents	Hemadsorbing agents	Mycoplasma	Protein testing	Trace metals / iron	Vitamins / hormones	Electrophoretic profile	IgG (µg/mL)
Engineered serum																
FetalClone™ I Serum, United States	SH30080	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•		•	•
FetalClone II Serum, United States	SH30066	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•		•	•
FetalClone III Serum, United States	SH30109	Triple 0.1 µm	≤ 10	≤ 25	•	•	•	•	•	•	•	•	•		•	•
Alpha Calf Serum without Iron, United States	SH30212	Triple 0.1 µm	≤ 10	≤ 30	•	•	•	•	•	•	•	•	•		•	•
Other serum																
Donor Equine Serum, United States	SH30074	Triple 0.1 µm	≤ 10	≤ 10	•	•	•	•	•	•	•	•	•		•	•
Porcine Serum, Irradiated, New Zealand	SH30908	0.2 µm	≤ 100	≤ 50	•	•	•	•	•	•	•	•	•		•	•

• = Tested. For typical results, request a certificate of analysis or go to cytiva.com/certificates
EMA conforming testing is available on all serum products for an additional charge
Testing procedures and results are compliant with EP2262

FBS products

Our innovative culture for defining quality in the industry developed to include both triple 100 nm and Serial 40 nm filtration. Our FBS products are sterile- filtered and pass rigorous quality testing to ensure dependable results for our customers.

Defined FBS

Defined FBS is for users who have a concern for viral contaminants and require an extensive biochemical profile. Defined FBS is filtered through serial 40 nm pore size-rated filters.

- Our highest quality FBS
- Subjected to extensive biochemical analyses
- Low endotoxin and hemoglobin specifications

Characterized FBS

Characterized FBS meets the requirements of most users. Characterized FBS is filtered through triple 100 nm pore size-rated filters.

- Standard endotoxin and hemoglobin specifications
- Subjected to moderate biochemical analyses

Standard FBS

Standard FBS is an economic alternative to Defined and Characterized FBS.

- Excellent choice for research applications
- Endotoxin and hemoglobin are tested and reported

HyClone FBS: process-tested and proven cell culture performance

Customer need	Serum sourced from BSE-negligible regions for low-risk applications	Serum low in endotoxin and features extensive biochemical analyses	Serum for general cell culture with common cell types	Serum for general cell culture using robust cell lines	Serum qualified for specialty research
Typical use					
Suggested products	Defined FBS, Australian Characterized FBS, Australian Defined FBS, New Zealand Characterized FBS, New Zealand	Defined FBS, United States Characterized FBS, United States Superlow IgG Defined, US Origin	Standard FBS, United States	FBS, South American USDA-Tested FBS FBS, Canadian	Charcoal/ Dextran Treated FBS, United States ES Screened FBS, United States
Product codes	SH31195 SH30084 SH31194 SH30406	SH30070 SH30071	SH30088	SV30160 SH30910 SH30396	SH30068 SH30071.02E SH30071.03E

 = Production  = Research

Defined FBS

Product	Volume	Product code
Defined FBS, United States CofS no. R1-CEP 2000-076 40 nm filtered Endotoxin: ≤ 5 EU/mL; hemoglobin: ≤15 mg/dL	50 mL 100 mL 500 mL	SH30070.01 SH30070.02 SH30070.03
Defined FBS, New Zealand CofS no. R1-CEP 2001-211 Serial 40 nm filtered Endotoxin: ≤5, Hemoglobin ≤15	50 mL 100 mL 500 mL	SH31194.01 SH31194.02 SH31194.03
Defined FBS, Australian CofS no. R1-CEP 2000-384 Serial 40 nm filtered Endotoxin: ≤5, Hemoglobin ≤15	50 mL 100 mL 500 mL	SH31195.01 SH31195.02 SH31195.03

Characterized FBS

Product	Volume	Product code
Characterized FBS, United States CofS no. R1-CEP 2000-076 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL	50 mL 100 mL 500 mL	SH30071.01 SH30071.02 SH30071.03
Characterized FBS, USDA Import Tested CofS not available Triple 100 nm filtered Endotoxin: ≤ 25 EU/mL; hemoglobin: ≤ 25 mg/dL Sourced from North America, Central America, Australia, and New Zealand	100 mL 500 mL	SH30910.02 SH30910.03
Characterized FBS, Canadian CofS not available Triple 100 nm filtered Endotoxin: ≤ 25 EU/mL; hemoglobin: ≤ 25 mg/dL	100 mL 500 mL	SH30396.02 SH30396.03

Characterized FBS

Product	Volume	Product code
Characterized FBS, New Zealand CofS no. R1-CEP 2001-211 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL	500 mL	SH30406.02
Characterized FBS, Australian CofS no. R1-CEP 2000-384 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL	500 mL	SH30084.03
Characterized FBS, South American CofS not available Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL	100 mL 500 mL	SV30160.02* SV30160.03*

Standard FBS

Product	Volume	Product code
Standard FBS, United States CofS no. R1-CEP 2000-076 Triple 100 nm filtered Endotoxin and hemoglobin tested and reported	100 mL 500 mL	SH30088.02 SH30088.03

CofS = certificate of suitability, available at cytiva.com/certificates

* Due to export restrictions, only available in Europe and select South American, African, and Asian countries

Specialty FBS products

Our specialty FBS products augment cell culture growth and support several applications that might require lower IgG levels, reduced levels of various hormones, or reduced concentrations of nucleotides and amino acids. Our specialty FBS products are designed for specific cell culture-based applications.

Super Low IgG FBS

This product is designed for applications where extremely low levels of inherent bovine IgG are required. Super Low IgG FBS has been chromatographically treated to reduce IgG levels to less than 5 µg/mL, while still retaining excellent cell growth properties.

- For use in monoclonal antibody production, virus propagation, and immunoassay procedures

Dialyzed FBS

Dialysis reduces concentrations of low molecular weight (M_r) components, such as nucleotides and amino acids, that impact alternative biochemical survival pathways. The process is reproducible and reduces hypoxanthine and thymidine concentrations below detectable limits, making Dialyzed FBS well-suited for incorporation or receptor studies.

- Processed using proprietary diafiltration method
- Depleted from small molecules (less than M_r 10 000)

Charcoal/Dextran Treated FBS

The exclusive and proprietary charcoal/dextran treatment reduces steroid levels. Charcoal/Dextran Treated FBS can be utilized in receptor studies or estrogen-related investigations. The extensive biochemical serum profile, provided before and after the treatment, ensures efficacy of the treatment and provides end-users with critical information regarding which components are specifically affected.

- Proprietary processing to reduce levels of various hormones and growth factors

Specialty FBS

Product	Volume	Product code
Super Low IgG FBS, United States CofS no. R1-CEP 2000-076 40 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL	100 mL 500 mL	SH30898.02 SH30898.03
Dialyzed FBS, United States CofS no. R1-CEP 2000-076 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL ≤ M_r 10 000	50 mL 100 mL 500 mL	SH30079.01 SH30079.02 SH30079.03
Charcoal/Dextran Treated FBS, United States CofS no. R1-CEP 2000-076 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL	50 mL 100 mL 500 mL	SH30068.01 SH30068.02 SH30068.03

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Screened FBS products

Prescreened from triple 100 nm filtered Defined FBS, our specialty serum products meet the needs of many specific cell culture applications. Our screened FBS products are a part of our specialty FBS portfolio.

ES Cell Screened FBS

ES Screened FBS supports the growth of undifferentiated murine embryonic stem cells. The screening includes plating efficiency, colony morphology, and toxicity tests.

- Optimized for the culture of murine embryonic stem cells

Human Mesenchymal Stem Cell Screened FBS

Human Mesenchymal Stem Cell Screened FBS supports the growth of undifferentiated human mesenchymal stem cells (hMSC). During screening, hMSC are observed for evidence of nutritional deficiency, cytotoxicity, or morphological aberrations.

- Designed for human mesenchymal stem cells

Tetracycline Screened FBS

Designed for researchers using tetracycline-regulated gene expression systems in cultured cells, Tetracycline Screened FBS is suitable for expression studies in Tet-on/Tet-off systems.

- FBS with undetectable levels of tetracycline

Insect Cell Screened FBS

With the increasing popularity of the Baculovirus Expression Vector Systems (BEVS), more researchers are culturing insect cells. Our Insect Cell Screened FBS supports robust growth of insect cells.

- To optimize performance of insect cells

Screened FBS

Product	Volume	Product code
ES Cell Screened FBS, United States CofS no. R1-CEP 2000-076 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL	100 mL 500 mL	SH30071.03E SH30071.02E
Human Mesenchymal Stem Cell Screened FBS, United States CofS no. R1-CEP 2000-076 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL	500 mL	SH30071.03M
Tetracycline Screened FBS, United States CofS no. R1-CEP 2000-076 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL	500 mL	SH30071.03T
Insect Cell Screened FBS, United States CofS no. R1-CEP 2000-076 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL	500 mL	SH30071.03I

CofS = certificate of suitability, available at cytiva.com/certificates

Bovine calf serum products

Bovine calf serum products are excellent and cost-effective alternatives to FBS. Bovine calf serum products contain exceptionally high levels of transferrin, which, when supplemented, can provide three to four times as much available iron as FBS. In many applications, the performance of calf serum will equal or even surpass that of FBS. Our bovine calf serum products are sterile filtered, quality tested, and provided with a clear statement of serum origin.

Iron-Supplemented Bovine Calf Serum

This iron-supplemented bovine calf serum contains three to four times as much available iron and transferrin as FBS or equine serum.

Newborn Bovine Calf Serum

Newborn bovine calf serum undergoes the same careful collection and processing procedures (including venipuncture) used for our bovine serum products.

New Zealand Newborn Calf Serum

All New Zealand calf serum products are carefully collected, processed, and filtered in New Zealand to ensure safety against bovine diseases. We follow the same standards in processing of our calf serum as with our FBS to enable offering the highest quality and traceability.

Bovine calf sera

Product	Volume	Product code
Bovine Calf Serum, United States CofS no. R1-CEP 2000-080 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: < 30 mg/dL Age at time of collection: 16–22 weeks	100 mL 500 mL 1000 mL	SH30073.02 SH30073.03 SH30073.04
Iron-Supplemented Bovine Calf Serum, United States CofS no. RO-CEP 2000-080 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: < 30 mg/dL Age at time of collection: 16–22 weeks	100 mL 500 mL 1000 mL	SH30072.02 SH30072.03 SH30072.04
Newborn Calf Serum, United States CofS not available Triple 100 nm filtered Endotoxin: ≤ 50 EU/mL; hemoglobin: ≤ 30 mg/dL Age at time of collection: < 10 days	100 mL 500 mL 1000 mL	SH30118.02 SH30118.03 SH30118.04
Newborn Bovine Calf Serum, New Zealand CofS no. R1-CEP 2000-190 Triple 100 nm filtered Endotoxin: ≤ 25 EU/mL; hemoglobin: ≤ 30 mg/dL Age at time of collection: < 21 days	500 mL 1000 mL	SH30401.01 SH30401.02
Iron Supplemented Newborn Serum, New Zealand CofS no. R1-CEP 2001-190 Triple 100 nm filtered Endotoxin: ≤ 25 EU/mL; hemoglobin: < 30 mg/dL Age at time of collection: < 21 days	500 mL 1000 mL	SH30626.02 SH30626.03

CofS = certificate of suitability, available at cytiva.com/certificates

Engineered serum products

Engineered serum products are designed to be a cost-efficient, high-performing replacement for FBS.

Alpha Calf Fraction

Alpha Calf Fraction is produced from our bovine calf serum using a proprietary non-ethanol process to reduce immunoglobulins and proteins to levels similar to those of FBS. This product typically contains less than 200 µg IgG/mL.

- Optimized for the growth of hybridoma cells
- Cost-effective medium supplement

FetalClone™ serum products

FetalClone serum products are a blend of specially processed bovine calf serum, FBS, supplements, and nutrients demonstrating equivalent or improved performance compared to FBS with comparable IgG levels. These products have demonstrated performance with a variety of cell lines, including hybridomas, Chinese hamster ovary (CHO), BHK-21, NS0, MRC-5, and Vero cells.

FetalClone I

- Optimized for the growth of hybridomas cells
- IgG levels comparable to those found in FBS
- Demonstrated cell growth performance equivalent to FBS

FetalClone II

- Optimized for the growth of CHO cells and derivatives
- Offering the same basic formulation as our FetalClone I, with additional growth factors and supplements
- Improved cell growth performance relative to FBS

FetalClone III

- The most versatile of our FetalClone family of products
- Demonstrated performance with a variety of cell lines including fibroblast, epithelial, hybridoma and myeloma cells
- Improved cell growth performance relative to FBS
- Offering the same basic formulation as found in FetalClone II, with additional growth factors and supplements

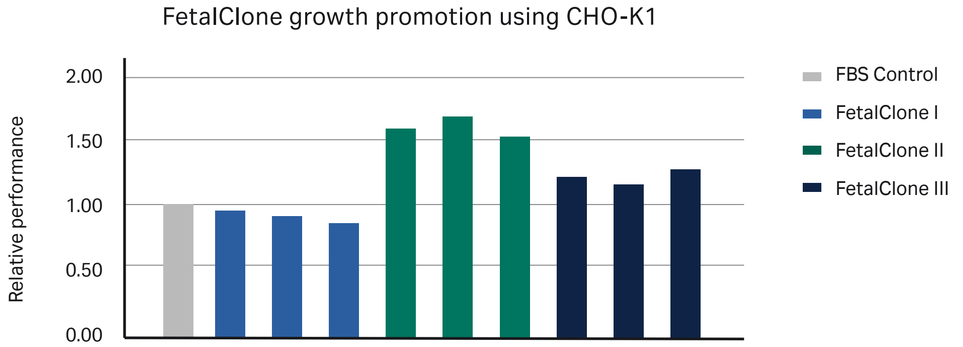

Fig 1. FetalClone growth promotion study using CHO-K1. Growth comparison study on three lots each of FetalClone I, II and III.

Engineered sera

Product	Volume	Product code
Alpha Calf Fraction, United States CofS no. R1-CEP 2000-080 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 30 mg/dL Age at time of collection: 16–22 weeks	500 mL	SH30212.03
FetalClone I, United States CofS no. R1-CEP 2000-185 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL Growth of hybridoma cells	100 mL 500 mL	SH30080.02 SH30080.03
FetalClone II, United States CofS no. R1-CEP 2000-185 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 25 mg/dL Growth of CHO-K1 and CHO derivatives	100 mL 500 mL	SH30066.02 SH30066.03
FetalClone III, United States CofS no. R1-CEP 2000-185 Triple 100 nm filtered Endotoxin: ≤10 EU/mL; hemoglobin: ≤ 25 mg/dL Most widely applicable, including fibroblasts	100 mL 500 mL	SH30109.02 SH30109.03

CofS = certificate of suitability, available at cytiva.com/certificates

Alternatives and species-specific sera

Non-fetal serum products are used to enhance cell culture performance and are cost-efficient alternatives. These products contain several naturally occurring growth-promoting factors including hormones, proteins, amino acids, glucose, and vitamins.

Bovine Growth Serum

Bovine calf serum supplemented with chemically defined components, such as vitamins, amino acids, trace metals, and other small molecules.

- Suitable for stimulating cell growth and proliferation
- Triple 100 nm filtered

Cosmic Calf Serum

This high-quality bovine calf serum is fortified with iron and naturally derived components and augmented with additional growth-promoting components to yield an exceptional bovine calf serum.

- Excellent performance with a variety of cell types
- Triple 100 nm filtered

Donor Equine Serum

Equine serum is carefully collected from animals fed an enriched diet to ensure proper nutrition. To reduce lipid concentration, the equine herd is fasted and then the blood is collected in a special facility using aseptic techniques. Coggins tests for equine infectious anemia are performed on each horse.

- Triple 100 nm filtered

New Zealand Porcine Serum

Our porcine serum is sourced from New Zealand, filtered in the United States through 200 nm pore size-rated filters, and is gamma irradiated at 25 to 40 kGy after filtration.

Alternatives

Product	Volume	Product code
Bovine Growth Serum, United States CofS no. R1-CEP 2000-080 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: < 30 mg/dL Age at time of collection: 16–22 weeks	100 mL 500 mL	SH30541.02 SH30541.03
Cosmic Calf Serum, United States CofS no. R1-CEP 2000-080 Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 30 mg/dL Age at time of collection: 16–22 weeks	100 mL 500 mL 1000 mL	SH30087.02 SH30087.03 SH30087.04

Species-specific sera

Product	Volume	Product code
Donor Equine Serum, United States Triple 100 nm filtered Endotoxin: ≤ 10 EU/mL; hemoglobin: ≤ 10 mg/dL Age at time of collection: > 6 months	100 mL 500 mL 1000 mL	SH30074.02 SH30074.03 SH30074.04
Porcine Serum, New Zealand 200 nm filtered and irradiated in the U.S. Endotoxin: ≤ 100 EU/mL; hemoglobin: ≤ 50 mg/dL	1000 mL	SH30908.04

CofS = certificate of suitability, available at cytiva.com/certificates

Related HyClone medium products

Classical liquid media

Our extensive line of classical media is system-tested with HyClone serum to ensure product efficacy and homogeneity. These products are available in convenient packaging for research applications. Commonly used products are shown in the list to the right.

Reagents and cell dissociation products

HyrTryp™ cell dissociation reagent

This product is an animal-derived component-free (ADCF) recombinant alternative to porcine trypsin that you can use to dissociate and harvest cells with confidence. This high-quality reagent is well-suited for cell-based vaccine production, as well as for stem cell, primary cell, and gene therapy cell culture processes. Use with attachment-dependent cell types, including MRC-5, Vero, and CHO K-1 cell lines grown with or without serum. Simply substitute it for porcine trypsin — there's no need to adjust your protocol.

Trypsin

Our product offering includes two commonly used concentrations of gamma-irradiated porcine trypsin (1:250 and 1:50).

Antibiotics and selection agents

We offer a variety of premium antibiotics and selection agents to control bacterial, yeast, fungi, and mycoplasma contaminations.

Cell Culture Grade Water

HyClone Cell Culture Grade Water is free of endotoxins, ensuring excellent reagent properties. In addition, we offer water for injection (WFI) quality water, molecular biology grade water, and a variety of other process liquids.

Related products	Product code
RPMI 1640 Medium with 25 mM HEPES and L-glutamine	SH30255
RPMI 1640 Medium with L-glutamine, dry powder	SH30011
DMEM with high glucose, 4.0 mM L-glutamine, and sodium pyruvate	SH30243
DMEM with high glucose and 4.0 mM L-glutamine • without sodium pyruvate	SH30022
DMEM with high glucose • without L-glutamine and sodium pyruvate	SH30081
DMEM with high glucose and L-glutamine • without sodium pyruvate	SH30003
Grace's Unsupplemented	SH30610
IMDM with L-glutamine and HEPES • without alpha-thioglycerol	SH30228
MEM with Earle's balanced salt solution (EBSS) and 2.0 mM L-glutamine	SH30024
HyrTryp™ reagent recombinant and animal-derived component-free alternative to porcine trypsin	SV30209
Trypsin 0.25%	SV30031

Related products	Product code
Trypan Blue Solution 0.4% in phosphate buffered saline	SV30084
Gentamicin Solution 50 mg/mL	SV30080
Antibiotic Antimycotic Solution (Pen/strep/fungizone), 100×	SV30079
Phosphate Buffered Saline (PBS)	SH30256
Dulbecco's Phosphate Buffered Saline (DPBS)	SH30264
HEPES 1 M solution	SH30237
Earle's Balanced Salt Solution (EBSS) 1×, with calcium, magnesium, phenol red	SH30029
Hank's Balanced Salt Solution (HBSS) 1×, with calcium, magnesium, phenol red	SH30030
L-Glutamine	SH30034
NEAA	SH30238
Cell Culture Grade Water Endotoxin-free (< 0.005 EU/mL), deionized, distilled, 100 nm sterile filtered	SH30529

For a complete list of products, please visit cytiva.com/certificates

HyClone products for cell culture

Innovation and quality

For more than 50 years, customer needs have fueled our development of innovative HyClone cell culture products, solutions, and manufacturing procedures. We manufacture cell culture media, serum, and process liquids at facilities around the world to the high quality that we've been known for over the past decades.

Cytiva is a global life sciences leader that works with academic and translational researchers, developers, and manufacturers of biotherapeutics, cell and gene therapies, and new technologies such as mRNA, to enable the delivery of transformative medicines. Cytiva is a trusted expert with nearly 10 000 associates in more than 40 countries dedicated to customers' speed, flexibility, capacity and efficiency in drug discovery, research, and manufacturing. Visit cytiva.com for more.

cytiva.com/hyclone

For local office contact information, visit cytiva.com/contact

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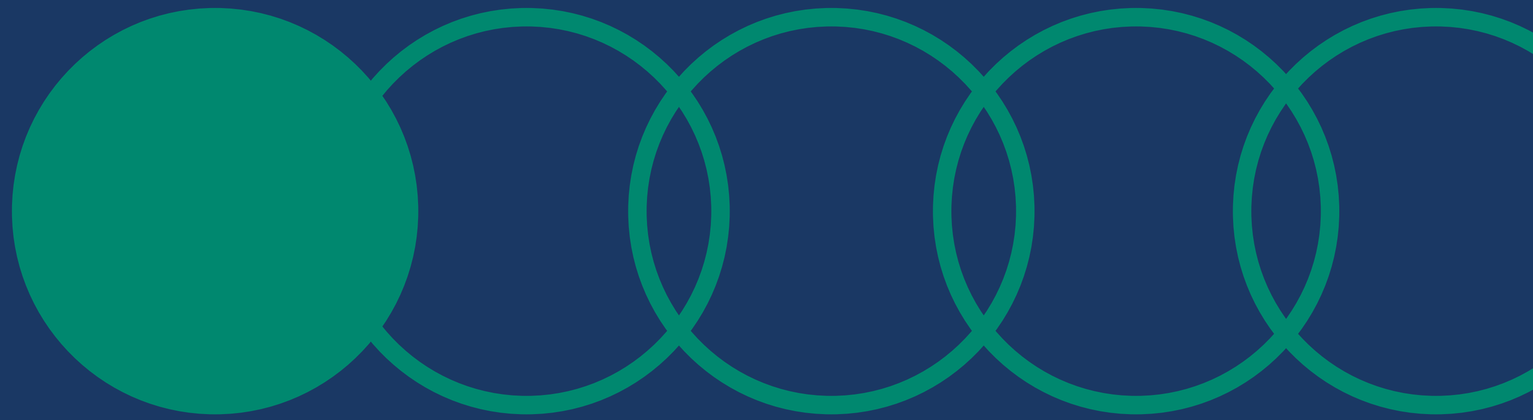

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