



BOVINE SERUM ALBUMIN (BSA)

AND OTHER PROTEINS

MP Biomedicals has an ideal option for your requirements.

Bovine Serum Albumin (BSA)

MP Biomedicals BSA can be used in a wide range of applications, including biosimilars, media applications, stem cells, bacterial and viral vaccines, infectious disease research and embryo transfer.

The main biological function of albumin is to regulate the colloidal osmotic pressure of blood. It is also used as a transport protein since it binds water, Ca, Na, and K, fatty acids, bilirubin, hormones and drugs.

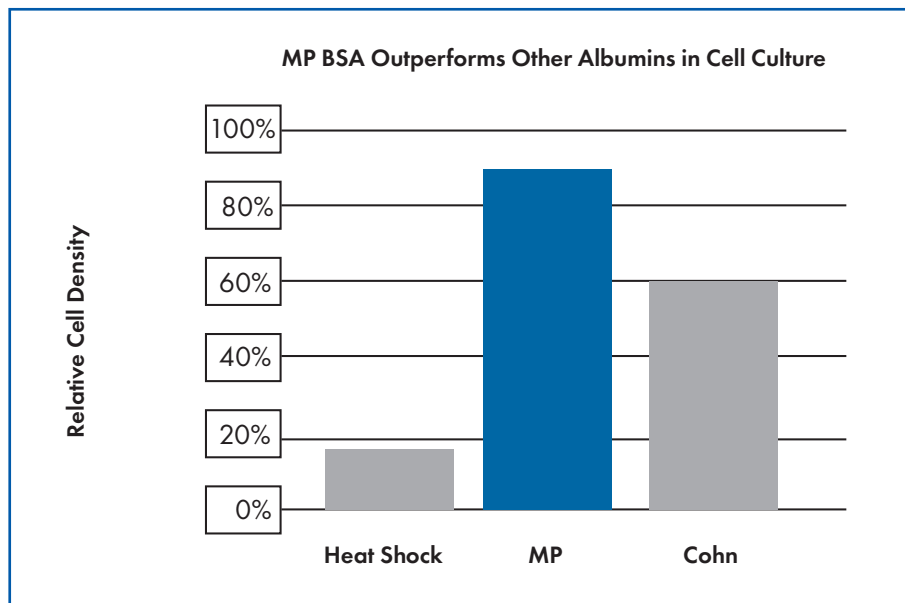
MP Bio NZ products minimize risk due to the following factors:

- Bovine Plasma sourced only from abattoirs in New Zealand, which has a negligible BSE risk status
- State of the art chromatographic extraction ensures high purity, intact proteins processed without the compromising effects of traditional methods
- Assured and secure supply chain

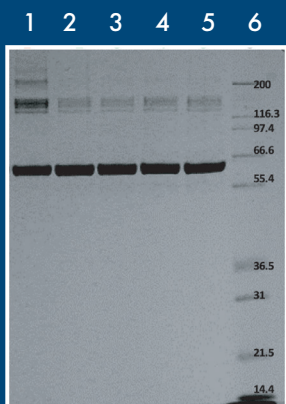
ISO 9001 certification and a Quality System audited to cGMP principles, the highest level of process control, consistent product quality and complete traceability

Highly flexible operations to enable better product mix and customized product offerings

MP Bio chromatographically purified bovine AlbumiNZ has demonstrated superior growth rates in cell culture (CHO and SP2/O cells) compared with traditional Cohn and Heat Shock BSA.



Note: Cells were seeded in serum-free media and supplemented with various albumins in multi-well plates, with MTT analysis performed at day 3. Cell densities were calculated relative to FBS control (100%).



10% Gel

Lane 1: Heat Shock BSA

Lane 2: AlbumiNZ™ Low Free Fatty Acid BSA

Lane 3: AlbumiNZ™ Low IgG BSA

Lane 4: AlbumiNZ™ Low Endotoxin BSA

Lane 5: AlbumiNZ™ Microbiological Grade BSA

Lane 6: MW Standards (kDa)

Note: SDS-PAGE reveals increased purity for the chromatographically purified AlbumiNZ, as evidenced by a higher monomer to dimer ratio and fewer bands.

Features:

- Large batch sizes of up to 240 kg
- Available as frozen liquid or lyophilized powder
- High cell processing performance resulting in high titers
- Full traceability
- Mild process avoids denaturing proteins
- Superior batch-to-batch consistency



A range of BSA for various applications

Microbiological Grade Bovine Albumin (Cat. # 02180620)

Apart from being low in endotoxin and protease activity, this grade has a very low ammonium content. It has been found to work very well in bacterial and viral cell culture, **animal vaccine production** and as a media supplement in **infectious disease research applications**.

Pack Sizes : 10g, 25g, 50g, 100, 500gm, 1Kg

Low IgG Bovine Albumin (Cat. # 02199897)

The material of choice for preparation of **monoclonal antibodies, for southern and northern blots, in blocking agents for EIA and RIA assays**, and in general immuno- assay work. The IgG is removed using highly specific affinity chromatography, and each batch is guaranteed to have an IgG content of ≤ 0.05 mg/g of protein.

Pack Sizes : 10g, 25g, 50g, 100, 500gm, 1Kg

Low Fatty Acid Bovine Albumin (Cat. # 02199899)

Low fatty acid bovine albumin is the material of choice for all **in-vitro embryo production work**, as well as a nutritional and surfactant additive for embryo transfer techniques. Used in **general cell and tissue culture**, in stem **cell media** as a supplement, and as a carrier in serum-free media. Every batch is guaranteed to have a free fatty acid content of ≤ 0.05 mg/g of protein.

Pack Sizes : 10g, 25g, 50g, 100, 500gm, 1Kg

Protease-reduced Bovine Albumin (Cat. # 02199898)

Used in diagnostic applications or where very low or no proteolytic activity is desired. The protease content is negligible at ≤ 0.0002 units/g of protein.

Pack Sizes : 25g, 50g, 100, 500gm, 1Kg

Ultra-Low IgG Bovine Albumin (Cat. # 02FC0076)

While the low IgG BSA (Cat.#02199897) has an IgG limit of up to 50 ppm, in certain applications this level becomes an antigen for cross-reacting secondary antibodies. Its presence can alter precious experimental data, resulting in reduced purification yields. These levels may also be problematic for certain recombinant protein or monoclonal antibody purification processes. For such applications, MP Bio NZ offers an ultra-low IgG grade of BSA where the IgG content is brought down to as low as 4 ppm.

Low Endotoxin Bovine Albumin (Cat. # 02199896)

With an endotoxin limit of 1 EU/mg, this grade is used in **general cell and tissue culture**, as a media supplement in stem cell research and as a carrier in serum-free media.

Pack Sizes : 10g, 25g, 50g, 100, 500gm, 1Kg

Except for the low free fatty acid BSA, all other MP Bio NZ BSA grades returned a lipid content of 35 mg/g of BSA when tested by an independent laboratory. This is 2.5x higher than the lipid content in competitor BSA produced from a chromatographic and heat shock process.

This high lipid content can benefit cell culture researchers by way of reducing the need to add components such as cholesterol concentrate or other additives, and could lead to significantly higher titer values at scale.

Bovine Serum Albumin (BSA)		Microbiological Grade	Low Endotoxin	Low IgG	Ultra-low IgG	Protease Reduced	Low Fatty Acid	Fraction 98% \geq	Fatty acid free, low endotoxin
Cat. #	02180620	02199896	02199897	02FC0076	02199898	02199899	1160069	194772	
Specifications									
Appearance	Off-White to Light yellowish-brown powder	✓	✓	✓	✓	✓	Off-white powder	light greenish flakes	White powder
Bioburden (cfu/g)	≤ 100	✓	✓	✓	✓	✓	✓	✓	✓
Endotoxin (EU/mg)	≤ 1	≤ 3	✓	✓	✓	≤ 3	✓	Typically ≤ 1 EU/mg	≤ 2.0 EU/mg
Moisture by Karl Fischer (w/w)	$\leq 5\%$	✓	✓	✓	✓	✓	✓	$< 6\%$	✓
Mycoplasma	None detected	✓	✓	✓	✓	✓	✓	✓	✓
pH	6.5 – 7.5	✓	✓	✓	✓	✓	✓	✓	✓
Purity by SDS PAGE (w/w Total Protein)	$\geq 97\%$	✓	✓	✓	✓	✓	✓	$\geq 98\%$	$\geq 98\%$
Solubility	Dissolves in ≤ 20 mins @ 15-25 °C	✓	✓	✓	✓	✓	✓	✓	✓
Total Protein (anhydrous w/w)	$\geq 95\%$	✓	✓	✓	✓	✓	✓	Typically $\geq 99\%$	✓
Virus 9 CFR 113.53(c)	none detected	✓	✓	✓	✓	✓	✓	✓	✓
BVDV	none detected	✓	✓	✓	✓	✓	✓	✓	✓
IgG (mg/g)	≤ 0.05	✓	✓	✓	≤ 4 ppm	✓	✓	✓	✓
Protease (units/mg Protein)	≤ 0.0002	✓	✓	✓	✓	✓	✓	✓	✓
Fatty Acid (mg/g)	≤ 0.05	✓	✓	✓	✓	✓	✓	✓	✓

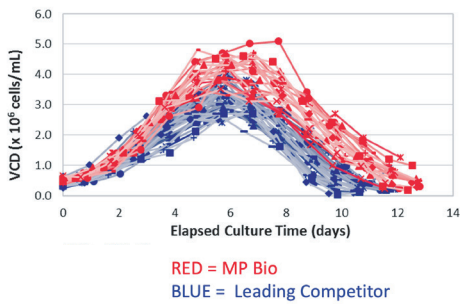
Customer Testimonials

Surpassing Industry Standards.

The results shown below are a comparison between the bioprocess results using MP Bio BSA vs. an industry leading competitor. The scale of the bioreactor was 10,000 L

and the processed cell line was a murine myeloma NS0. This evaluation was done by a prominent worldwide biopharma company.

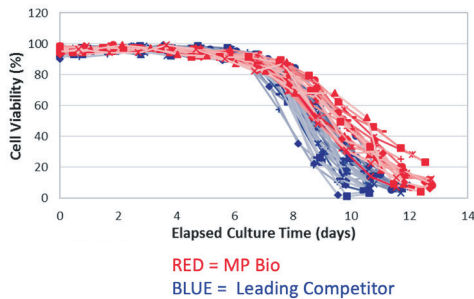
Improve your Cell Growth



A prominent NIAID researcher states:

“Chromatographically purified NZ BSA from MP Biomedicals has been tested successfully with parasite infected cell lines representing all major endemic continents. Additionally, DNA transfections using various selectable agents (WR99210, blasticidin S, trimethoprim) have shown to be successful and it is also compatible with the c-SNARF limiting dilution assay.”

Improve your Cell Viability

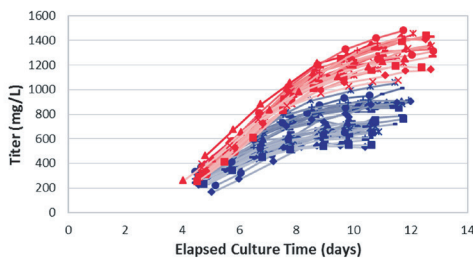


A customer on comparing the performance of AlbumiNZ with human albumin:

“Mouse embryos cultured in the New Zealand BSA had comparable cell numbers to the HSA control”

(customer evaluation, 2011)

Improve your Productivity



+ 52%
Improved Productivity

An embryo transfer customer on comparing AlbumiNZ with competitor BSA:
“The use of MP Bio-New Zealand BSA during IVF and IVC resulted in more and better quality embryos than a competitor BSA”

(Schumann, Theriogenology (2002) 57:1:527)

BOVINE THROMBIN

Thrombin (factor IIa) is a serine protease that converts fibrinogen into fibrin in blood coagulation. With its procoagulant and anticoagulant functions, it plays a significant role in thrombosis and hemostasis. It is an agonist for many cellular responses during inflammation and wound repair. Many diseases including stroke and myocardial infarction involves thrombosis, and thrombin is therefore a preferred target of antithrombotic drugs.

Drugs available to block thrombin action include heparins, hirudins (lepirudin and bivalirudin), Vitamin

inhibitors, such as Dabigatran and Argatroban.

K antagonists and a new generation of direct thrombin

Thrombin is used throughout the diagnostics industry in a variety of coagulation assays, clotting factor tests and

defibrination of blood or plasma for serum controls. It also finds applications in clot-activated blood collection tubes, in the meat industry as a meat glue and in bio-inks to produce engineered/artificial tissue using 3D printing. Thrombin is also used for site specific cleavage of recombinant fusion proteins and in biochemical and medical research applications.

The High Specific Activity Thrombin is especially suited for use in medical devices for haemostasis. A validated 2-step virus inactivated product is available for use in such applications.

MP Bio NZ manufactures Thrombin from bovine plasma using prothrombin activated with thromboplastin extracted from bovine lung tissue.

Product Specifications

Test	High Specific Activity Thrombin (Cat.# 02180539)	Low Specific Activity Thrombin (Cat.# 02199907)
Packaging*	Glass Vial	Glass Vial
pH	5.7 - 6.7	7.0 - 8.0
Excipients	Sodium Citrate	For Information Only (contains Tris, HCl, NaCl)
% Protein	Report the result	≥ 50%
Thrombin Activity (Units / mg powder)	Report the result	Report the result
Thrombin Specific Activity (NIH Units / mg Protein)	> 2000	90 – 300

*Low Specific Activity Thrombin is also available as a bulk lyophilized powder in customized pack sizes of 75 MU or higher.

BOVINE FIBRINOGEN

Fibrinogen is a blood protein that is involved in the clotting cascade and converts to Fibrin in the presence of Thrombin.

Bovine Fibrinogen has been used in the study of haemostatic therapy in surgical and massive trauma patients. These studies have shown that Fibrinogen may prove to be more superior in stopping blood loss when compared to using fresh frozen plasma (FFP).

Fibrinogen can be used for preparation of Fibrin plates for analysis of fibrinolytic enzymes, as a substrate for clotting assays, and in the study of Fibrinogen degradation products.

MP Bio NZ manufactured Bovine Fibrinogen is 90% clottable and is supplied as a lyophilized powder.

Product Specifications:

Test	Fibrinogen (Cat.# 0882022)
Protein, Biuret	For Information - typically > 60%
% Clottable Protein, Biuret w/w	≥ 90%
Excipients	For Information - Trisodium Citrate, NaCl, Tween 80
Moisture by Karl Fischer	For Information - typically ≤ 10%
pH	For Information - typically between 5 - 7

BOVINE IMMUNOGLOBULIN G

Immunoglobulins, or Gamma Globulins, are plasma proteins with broad binding capacity. Produced by cells of the immune system, these proteins are designed to bind invading organisms such as bacteria and viruses, leading to their destruction. Immunoglobulin G (IgG) is the most prominent form.

MP Bio NZ Immunoglobulin G is a high purity, lyophilized powder, captured with a high specificity from pooled bovine plasma using a full chromatographic method. The technology gently extracts the IgG, maintaining the native configuration throughout the process.

Applications of IgG:

- ✓ *Blocking reagent in immunoassays – ELISA, Western blotting, immune-diffusion*
- ✓ *Reference antigen or standard*
- ✓ *For conjugation of molecules requiring highly purified immunoglobulin*
- ✓ *Used in the manufacture of diagnostic kits*

Product Specifications

Test	IgG (Cat.# 0864140)
Purity (SDS - PAGE), w/w Total Protein*	≥ 95%
Total Protein (anhydrous - Kjeldahl Nitrogen) , w/w	≥ 97%
pH (4% w/v Solution)	4.0 - 5.0
Moisture (Karl Fischer), w/w	≤ 10%
Sodium (ICP OES), w/w	≤ 1.5%
Chloride (Potentiometric Titration), w/w	≤ 2.4%

* Technical Grade IgG with a purity of ≥ 90% is also available

BOVINE TRANSFERRIN

Iron is an essential growth nutrient in almost all living organisms and is toxic in its free form. It must thus be carried by proteins such as Transferrin, which has the capacity to bind ferric ions. Transferrin is hence considered the most 'natural' means of managing iron transport. Transferrin is the major serum protein produced in the liver and secreted into the blood. It is responsible

for the transport of iron in almost all cell types. In cell culture applications, Transferrin is used to control iron metabolism. It is also used as a nutrient in cell and microbial culture and as a media supplement in the production of biopharmaceutical products.

MP Bio New Zealand offers 2 forms of Transferrin viz:

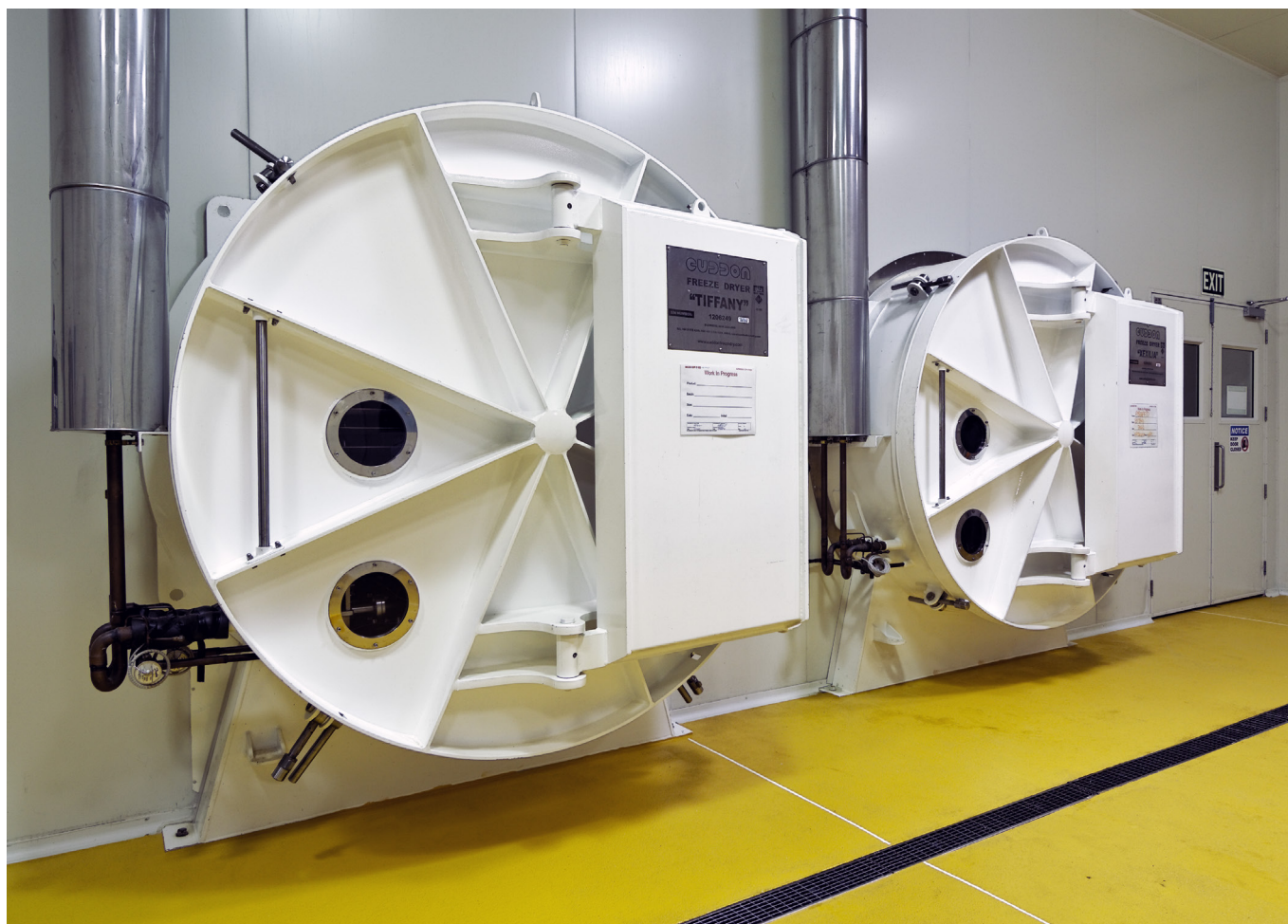
- ✓ *Holo-transferrin - Saturated with iron Fe^{3+} and used to supply iron in cell culture media*
- ✓ *Apo-transferrin - free of iron and used to remove iron in cell culture media*
- ✓ *Both forms of Transferrin are subjected to pasteurization (10 hr at 60 °C)*
- ✓ *Extracted using chromatographic methods*

Primary applications of Transferrin

- ✓ *Aids in prevention of iron toxicity in mammalian cell culture systems*
- ✓ *Assists in controlling iron metabolism in cell culture systems*
- ✓ *An integral part of serum-free or reduced-serum media*
- ✓ *Used in bio-manufacturing and tissue culture*

Product Specifications:

Test	HOLO Transferrin (Cat.# 02152335)	APO Transferrin (Cat.# 02152334)
Appearance	Red to Brown Powder	Off-white to Pink
Bioburden (CFU/g)	≤ 100	≤ 100
Endotoxin (EU/mg)	≤ 1	≤ 1
Iron (µg/g protein)	≥ 1200	≤ 40
Moisture by Karl Fischer, w/w	≤ 5%	≤ 5%
Mycoplasma	None Detected	None Detected
pH	6.0 – 8.0	7.0 – 8.0
Purity (SDS-PAGE), w/w Total Protein	≥ 95%	≥ 95%
Solubility (3% w/v in water)	Dissolves in ≤ 20 minutes at 20 - 25 °C	Dissolves in ≤ 20 minutes at 20 - 25 °C
Total Protein, anhydrous - Kjeldahl Nitrogen, w/w	≥ 95%	≥ 95%
Virus 9CFR 113.53(c)	Not Detected	Not Detected



Fetal Bovine Serum^{TAE}
 Azoxymethane
 Lysing Matrix
 Tween 20
 Trypan blue
 LSMTM lymphocyte separation medium
 Amphotericin B
 Mycoplasma Removal Agent
 MURASHIGE AND SKOOG MEDIUM
 ENZYME INHIBITORS
 CORN OIL
 HEPES
 PROTEINASE K
 Acrylamide
 Dimethyl Sulfoxide (DMSO)
 TRIS
 IMIDAZOLE
 Triton X
 Hemin Chloride
 Sodium Acetate
 Mitomycin C
 Gellan Gum
 PIPES
 RPMI
 Casein
 Dextran Sodium Sulfate
 AMPHOTERICIN B
 Roll & Grow plating beads
 Zymolyase
 DMEM
 RPMI
 Gentamicin sulfate
 TRIMPURETM
 Agar



MP Biomedicals

North America: 800.854.0530 | custserv.na@mpbio.com
Canada: 800.854.0530 | custserv.ca@mpbio.com
Latin America: 800.854.0530 | custserv.la@mpbio.com
China: +86 400.150.0680 | custserv.cn@mpbio.com
Japan: +81 3.6667.0730 | custserv.jp@mpbio.com
Singapore/APAC: +65 6775.0008 | custserv.ap@mpbio.com
South Korea: +82 2.425.5991 | custserv.kr@mpbio.com
India: +91.22.27636921/22/25 | custserv.in@mpbio.com
Australia: +61 2.8824.2100 | custserv.au@mpbio.com
New Zealand: +64 9.912.2460 | custserv.nz@mpbio.com
Europe: 00800.7777.9999 | custserv.eur@mpbio.com
Germany: 0800.426.67337 | custserv.de@mpbio.com
Austria: 00800.7777.9999 | custserv.de@mpbio.com
Poland: 00800.7777.9999 | custserv.po@mpbio.com
Belgium: 00800.7777.9999 | custserv.be@mpbio.com
France: +33 3.88.67.54.25 | custserv.fr@mpbio.com
Italy: 00800.7777.9999 | custserv.it@mpbio.com
The Netherlands: 00800.7777.9999 | custserv.nl@mpbio.com
Switzerland: 00800.7777.9999 | custserv.ch@mpbio.com
Serbia: +381 11.242.1972 | custserv.se@mpbio.com
Russia: +7 495.661.0008 | custserv.rs@mpbio.com
UK: 0800.282.474 | custserv.uk@mpbio.com

A World of MP Bio Products

- Apoptosis
- Cell Biology
- Culture Growth Media
- FastPrep® Sample Prep
- Immunology
- Molecular Biology
- Adsorbents
- Biochemicals
- Fine Chemicals
- Labware
- Dosimetry
- Research Diets
- SafTest™ Food Quality
- Diagnostics
- Drugs of Abuse
- Infectious Disease
- EIA/RIA