M-Gredient® Product Family

The Life Science business of Merck operates as MilliporeSigma in the U.S. and Canada.

Millipore®

Preparation, Separation, Filtration & Monitoring Products

A Legacy of Excellence, Shaping Tomorrow's Solutions Today!

For over a century we have established ourselves as a leader in the development of culture media and microbiological reagents.

Our **M-Gredient® product family**, featuring ingredients from peptones to extracts, sugars, and other components, is designed for advanced biotechnological and microbiological applications. With a broad portfolio that delivers a complete documentation as well as highly consistent and customizable quality, the M-Gredient® product line supports applications such as fermentation, culture media formulation, starter culture development, and various other biotechnological applications.

The M-Gredient® product line is thoughtfully divided into two key categories:

Prime

Experience the assurance of quality with our Prime ingredients and benefit from

- Extended microbiological and chemical quality control.
- Customized quality control available for larger volume orders.
- Comprehensive documentation.
- Options for granulation for rapid dissolution in water, as well as convenient and safe handling.
- Halal and Kosher certificates available for many Prime ingredients.

Specialty

Explore our Specialty ingredients, which include

- A broad range of various special ingredients
- Various unique animal alternative products.
- Versatile solutions catering to a broad spectrum of applications while maintaining exceptional quality.
- The option that for larger volume orders, each product can also be made available in large pack sizes with customizable packaging material.

Peptones and Extracts

Peptones - What are peptones?

Peptone comes from the Greek word meaning ‘digested’ or ‘to digest”. Peptones are a mixture of water-soluble polypeptides, peptides, amino acids and other substances remaining after the digestion of protein material. They usually contain about 50% carbon, 7% hydrogen 23% oxygen 16% nitrogen and 0-3% sulfur. Water soluble peptones have a molecular weight between 200 to 6000 Da. The protein materials from which peptones are commonly produced include: bovine or porcine meat, milk protein (casein), soybean, gelatin, and yeast. Peptones are termed after the origin of raw material and often the process of hydrolysis is also used. The digestion of the protein material occurs either enzymatically or by acid treatment. For the enzymatic hydrolysis of protein material proteolytic enzymes such as pepsin, papain, pancreatin which contains trypsin and chymotrypsin or trypsin. The enzymes are of animal (pancreatin or pepsin) or vegetable origin (papain from papaya), or proteases from microbial origin.

The manufacturing of peptones

Protein is broken down in a digestion or hydrolysis process to polypeptides of various lengths and amino acids. The quality of the raw material employed, their storage, and the digestion process parameters determine the quality of the peptones. Raw materials must be stored under conditions that avoid growth of spoilage organisms. Fresh meat is chilled stored up to digestion, whereas frozen meat is thawed shortly before processing. The first step in the manufacturing of peptones is the digestion or hydrolysis of the raw material. In a hydrolysis vessel the raw material is dispersed in water to which the digesting agent is added. In the second step of the process the digest is centrifuged, so that fat and oil can be removed. Thereafter, the digest is filtered, the liquid concentrated in a vacuum heat exchanger to a syrup which is in the final step spray dried to powder. Filtration reduces drastically the bioburden, particularly of peptic and tryptic digests that are kept over long periods at about 40 °C. After filtration the bioburden is commonly low and concentration to syrup contributes to the preservation. The growth characteristics of peptones varies with the composition of raw materials and the digestion process parameters. Raw materials employed, such as meat or vegetables, vary in the concentration of fermentable carbohydrates.

Production of Peptones

Raw materials e.g. meat, casein, soy meal, gelatin

Enzymatic hydrolysis

Filtration

Concentration

Filtration

Spray drying

Granulation (for some products)

Final product: Peptone

Acid hydrolysis

The digesting agent in a complete or total acid hydrolysis is commonly hydrochloric acid (HCl, 6-8 N). The digestion occurs typically at a temperature of ca. 110 °C and takes about 18-24 h. Acid hydrolysis is a crude process that cleaves all peptide bonds. Acid hydrolysis results commonly to a total hydrolysis of protein to amino acids. The process destroys glutamine, asparagine, tryptophan, cysteine, serine, threonine, lysine, aspartic acid, proline racemizes amino acids and completely destroys vitamins. The degree of destruction with time of hydrolysis and varies from one protein to another. Decolorization of the digest using activated charcoal and the filtration contribute to a further loss of water-soluble amino acids and vitamins. Low yields of serine and glutamic acid often occur when hydrochloric acid is removed from acid hydrolysates by desiccation. When carbohydrates are present cysteine and cystine yields are low. The stability of peptide bonds formed by valine, isoleucine and leucine often leads to low yields of these amino acids. Special conditions of hydrolysis increase the yields of the most labile derivatives. The neutralization step with sodium hydroxide makes that the salt (sodium) content of acid hydrolysate is high. This high salt content makes that the N content per gram peptone is relatively low. Acid hydrolysis yields a peptone formulation that may benefit from supplementation for optimal microbial growth, with the addition of an enzymatic digest or meat extract enhancing its effectiveness.

Enzymatic hydrolysis

Proteolytic enzymes hydrolyze peptide bonds formed by specific amino acids. It produces high yields of peptides. Thanks to its mild hydrolysis conditions the integrity of many amino acids can largely be maintained.

Peptic digestion typically yields larger peptide fragments resulting in relatively high molecular peptides. If the neutralization of the digest occurs with sodium hydroxide the ash content is increased. This neutralizes reduces the N content per gram.

Pancreatic digestion produces a balanced mixture of amino acids, including essential amino acids, in an optimal ration and low molecular peptides.

Papain digestion is based on the sulfhydryl protease from Carica papaya latex. Papain has a wide specificity and degrades most protein substrates more extensively than trypsin, pepsin, chymotrypsin or pancreatic proteases.

Tryptic peptone produced via the controlled enzymatic digestion of protein substrates using trypsin, is excellent nutrient base for the growth of microorganisms thanks to its consistent mix of peptides and amino acids.

Bacterial proteases (e.g. from *Bacillus subtilis* or *Streptomyces griseus*) provide an excellent means of degrading small polypeptides into smaller peptides and amino acids. The extensive hydrolysis is comparable to that of a mild acid hydrolysis. Unlike acid hydrolysis bacterial proteolytic hydrolysis does not destruct amino acids and vitamins.

Extracts

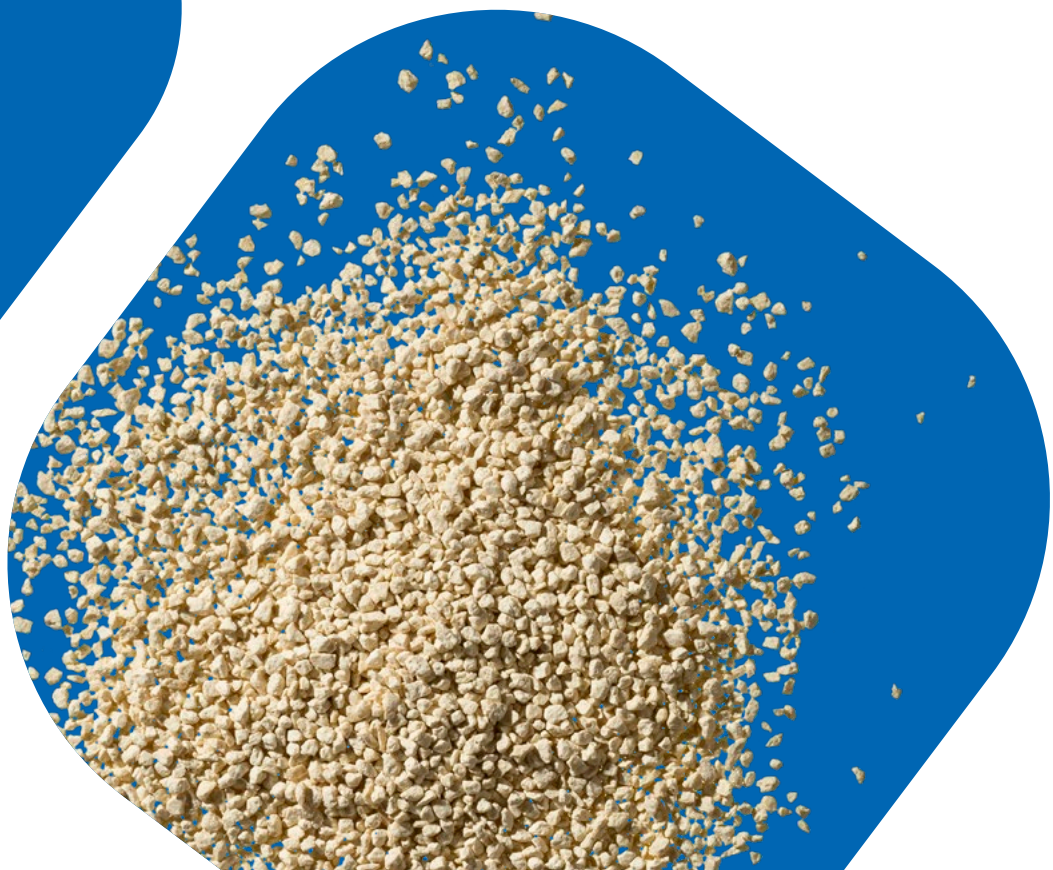
An extract is the concentrate produced from the infusion. An infusion is the water-soluble fraction obtained by soaking of a substrate in water for a period of time and the following filtration to clear solution.

Yeast extract as a special and important type of the M-Gredient® extracts is produced by fermenting yeast (e.g., *Saccharomyces cerevisiae*) on molasses serving as carbohydrate source. The cells are then autolyzed to release the intracellular nutrients, and subsequently concentrated, filtrated, pasteurized and finally spray dried.

Yeast Extract Production

- Yeast Strain Cultivation
- Yeast Fermentation → Yeast Biomass
- Autolysis
- Separation
- Concentration
- Filtration
- Pasteurization
- Concentration
- Storage
- Spray Drying
- Granulation (for some products)

Final product: Yeast Extract



Application and selection of peptones/extracts

Composition data versus microbial growth criteria

Peptones and extracts such as yeast or meat extract, are employed in a wide range of microbiological and biotechnological applications, for example:

- **Antibiotic Production:** Peptones serve as a nitrogen source for the growth of microorganisms, that produce antibiotics. For example, *Streptomyces* species known for their antibiotic production, are cultivated in media supplemented with specific peptones that support growth and metabolic activity.
- **Enzyme Production:** Enzymes can be produced industrially through fermentation for which peptones provide essential amino acids and nitrogen for the growth of specific strains of fungi or bacteria. For instance, *Aspergillus* species grown in media containing peptones can be used for the production of amylases and proteases.
- **Large-Scale Fermentation:** In various other large-scale fermentation processes, peptones and yeast extracts are used for the production of various products, such as biofuels or ingredients used in the cosmetic industry, like hyaluronic acid, which is obtained by the fermentation of *Streptococcus*.
- **Food Industry Applications:** In the food industry, peptones and extracts are vital for developing starter cultures used in fermentation processes, such as yogurt and cheese production. These cultures require specific nutrient compositions to thrive, and the right peptones can enhance the flavor and texture of the final products.
- **Microbiological Culture Media:** In microbiological culture media used for testing pharmaceutical, environmental, food or cosmetic samples, peptones and yeast extracts are essential components in the formulation.

For each application there is a different demand to the material. A peptone or extract suitable for an optimal growth of an organism is not necessarily satisfactory for another organism or production of a desired product.

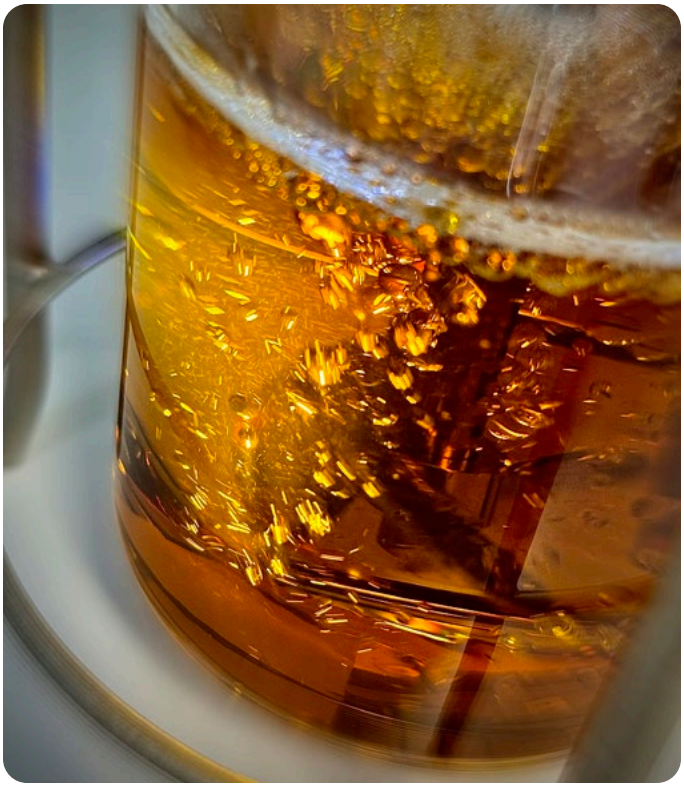
A range of visual, physical, and composition data, characterizes peptones and extracts. The composition data commonly provide only information that is useful for a gross preliminary selection. The composition information allows to select the ingredient with specific nutritive characteristics, for example, the nitrogen or amino nitrogen content. However, sometimes a discrepancy is seen between the physical and chemical values and the biological test results. The composition, appearance, chemical and physical test parameters may be satisfactory, but if a biological test gives aberrant results the ingredient is not suitable. A high total N and amino nitrogen content can be accompanied by poor growth promoting properties. In selection, or optimizing the performance of fermentation applications, it is often necessary to test an assortment of peptones or extracts at a variety of concentrations. Also, the lot-to-lot variation should be taken in account. Evaluations of multiple lots may be necessary to reproduce growth characteristics of a given material producing a high yield.

Physical characteristics

Color of dehydrated material

The color of peptones may vary from white to cream; beige to light brown. The color of a peptone depends on the processing and raw material. For example, a papain digest of liver has a light brown color, whereas an acid hydrolysate of casein is white. It is not necessary that the whiter the color is, the better the peptone. A white color indicates commonly that a peptone is processed (activated charcoal and filtering). Decolorization of the digest using activated charcoal and filtration contributes to a loss of water-soluble amino acids and vitamins. A dark brown color may indicate a deterioration. In case of peptic or pancreatic peptones a dark brownish color occurs when the filtered digest is hold for too long at temperatures >60°C. This causes non enzymatic browning. The color of the peptone is informative when various batches of a given peptone from a given manufacture are compared. A darkening of a given color indicates a deterioration. The color must fall within an accepted range; dark powders yield dark solutions and are not acceptable.

Yeast, meat, and malt extracts exhibit colors ranging from beige and yellow to brown.



Structure

The structure of dry material must be homogenous. No conglomerates, foreign materials or structure modifications are permitted.

The prime M-Gredient® peptones and extracts can be offered in a granulated format. Our special granulation capabilities ensure rapid and uniform dissolution in water, as well as convenient and safe handling of the product, as it prevents clumping and inhalation of the airborne powder.

pH

A 2–5% solution of the respective ingredient is prepared. The pH should be as specified. Variations from the specified pH values can indicate the deterioration of peptones or extracts during storage or heating.

Color in solution

A peptone solution with defined concentration is prepared. The solutions are tested against standard controls. The color-corrected absorption must not exceed the given values.

Clarity-solubility

Clarity in different fluids after autoclaving is eliminatory. A clear medium after autoclaving allows the observation of microbial growth. A peptone solution of 1, 2 or 5% is prepared, checked on clarity and solubility. Thereafter it is autoclaved and checked again on clarity and solubility.

Compatibility with other ingredients

Peptones are mostly used in complex media. Their physical compatibility must be tested with other frequently used ingredients. When a peptone is incorporated into the medium, it should not cause precipitation, and the final product should exhibit the expected color, clarity, and microbial growth performance.

Chemical characteristics

Loss on drying

It is determined as the loss in weight, achieved by drying the ingredient typically at 105 °C for 4 h. Loss on drying gives information on the moisture content of a peptone. The moisture content is indicative for the stability and shelf life. For optimal storage a peptone has a moisture content of less than 10%. If the moisture is too high, there is an increased risk of bacteriological deterioration.

Total nitrogen

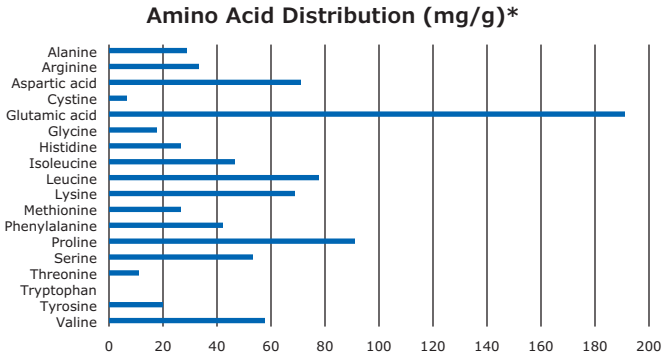
Total nitrogen content can be determined by Kjeldahl digestion and titration. The total nitrogen content can be used to estimate the protein content.

Amino-nitrogen

Amino nitrogen content is more important. It gives information on the nutritional value. The increase in the amino acid concentration gives an indication on the hydrolysis of the raw material. A high amino acid concentration indicates a high degree of hydrolysis.

Amino acid distribution

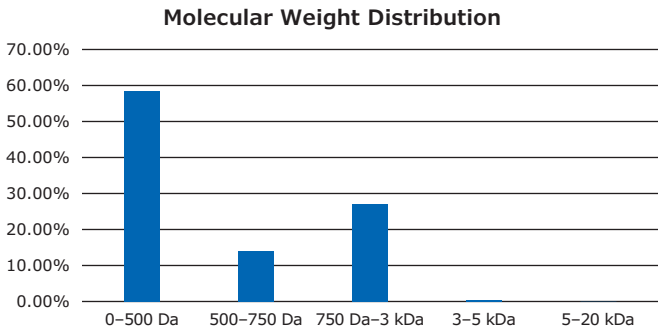
Amino acid analysis gives information on the presence of amino acids and their levels.



*exemplary amino acid profile

Molecular weight distribution

Oligopeptides and amino acids provide a readily available source of amino-nitrogen for microbial nutrition. Sephadex G25 gel filtration of a peptone or extract solution provides information on the distribution of polypeptides. The analysis can help blending of peptones to obtain the widest spectrum of peptides. When combined with microbial growth data it is a useful instrument in the selection and blending of peptones. Peptides with molecular weights greater than 6000 Da are denatured by autoclaving at 121 °C for 15 min, rendering them nutritionally ineffective and ideally removed from the formulation. In contrast, lower molecular weight peptides (<5000 Da) are readily taken up by microorganism, have a great nutritive value, and represent a valuable source of amino acids.



Nitrites

Nitrites form an indication of microbial contamination. Nitrites should be absent.

Total carbohydrates

The total carbohydrate level gives information about the presence of sugars (hexoses, disaccharides, polysaccharides etc.).

Ash

Ash is the inorganic residue remaining after the water and organic matter have been removed by heating in the presence of oxidizing agents. The ash content is a measure of the total amounts of minerals present. The ash content gives information on the level of sodium chloride, phosphates, sulphates, silicates, and metal oxides.

Chlorides

The sodium chloride or salt content is related to the ash content. It is high in acid and peptic digested peptones.

Phosphates

Phosphate content gives an information on the buffering capacity.

Calcium and Magnesium

Calcium and Magnesium content provides information on the nutritive value of peptones and extracts. Accurate data on their concentrations are required for sensitivity testing media. These ions are the principle cause of turbidity when they react with phosphates and carbonates.

Microbiological characteristics

Growth performance

The growth performance of a selection of strains is tested in a complex media. The growth promoting properties are measured in terms of turbidity, or generation time. A set of inoculated samples, and a previous batch are included in the growth promoting properties testing. The complex media are prepared omitting the ingredient to be tested. The peptone under investigation is added to the incomplete complex medium in various concentration (above and under the concentration acc. to the formulation).

Kosher and Halal Certifications

Our M-Gredient® product family includes a selection of Prime ingredients that are both Kosher and Halal certified. These products comply with the rigorous standards and certification requirements of both Kosher and Halal certification authorities.To ensure consistent quality and compliance, our manufacturing facilities undergo regular audits to verify our ability to supply certified Kosher and Halal products. This commitment to quality assurance provides our customers with confidence that their selected ingredients meet these demanding specifications.The table below provides an overview of all M-Gredient® products that carry Kosher and Halal certifications.

Product Name	Cat. No
M-Gredient® Casein Peptone A4	**132373**
M-Gredient® Casein Acid Hydrolysate	**102245**
M-Gredient® Soy Peptone A2	**111932**
M-Gredient® Yeast Extract A2	**113885**
M-Gredient® Yeast Extract A3	**117257**

Product List

Prime M-Gredient® Peptones and Extracts

Overview & Pack Sizes

Group	Product Name	Suffix	Pack Sizes	Cat. No.
Prime				
Milk-Derived Ingredients	M-Gredient® Casein Peptone A1	Pancreatically Digested, Granulated, Prime, for Biotechnology and Microbiology	1 kg 2.5 kg 25 kg	**107213**
	M-Gredient® Casein Peptone A2	Pancreatically Digested, Prime, for Biotechnology and Microbiology	500 g	**102239**
	M-Gredient® Casein Peptone A3	Pancreatically Digested, Prime, for Biotechnology and Microbiology	1 kg 25 kg	**111931**
	M-Gredient® Lactalbumin Peptone	Pancreatically Digested, Prime, for Biotechnology and Microbiology	5 kg	**112523**
	M-Gredient® Casein Acid Hydrolysate	Prime, for Biotechnology and Microbiology	500 g	**102245**
	M-Gredient® Casein Peptone A4	Enzymatically Digested, Halal and Kosher, Prime, for Biotechnology and Microbiology	1 kg 25 kg	**132373**
Animal-Derived Ingredients	M-Gredient® Skim Milk Powder	Prime, for Biotechnology and Microbiology	500 g	**115363**
	M-Gredient® Meat Peptone A1	Enzymatically Digested, Granulated, Prime, for Biotechnology and Microbiology	1 kg 2.5 kg 25 kg	**107214**
	M-Gredient® Meat Peptone A2	Peptically Digested, Granulated, Prime, for Biotechnology and Microbiology	1 kg 2.5 kg	**107224**
	M-Gredient® Proteose Peptone	Prime, for Biotechnology and Microbiology	1 kg	**107229**
	M-Gredient® Tryptose	Prime, for Biotechnology and Microbiology	1 kg 25 kg	**110213**
	M-Gredient® Gelatin Peptone	Pancreatically Digested, Prime, for Biotechnology and Microbiology	1 kg	**107284**
	M-Gredient® Universal Mixed Peptone M 66	Prime, for Biotechnology and Microbiology	1 kg	**107043**
	M-Gredient® Meat Extract	Granulated, Prime, for Biotechnology and Microbiology	500 g 2.5 kg	**103979**
Plant-Derived Ingredients	M-Gredient® Soy Peptone A1	Papain Digested, Granulated, Prime, for Biotechnology and Microbiology	500 g 5 kg 25 kg	**107212**
	M-Gredient® Soy Peptone A2	Papain Digested, Prime, for Biotechnology and Microbiology	25 kg	**111932**
	M-Gredient® Malt Extract	Prime, for Biotechnology and Microbiology	500 g 25 kg	**105391**
Yeast Ingredients	M-Gredient® Yeast Extract A1	Granulated, Prime, for Biotechnology and Microbiology	500 g 5 kg 25 kg	**103753**
	M-Gredient® Yeast Extract A2	Prime, for Biotechnology and Microbiology	10 kg 25 kg	**113885**
	M-Gredient® Yeast Extract A3	Prime, for Biotechnology and Microbiology	1 kg 25 kg	**117257**

Overview & Pack Sizes

Group	Product Name	Suffix	Pack Sizes	Cat. No.
Specialities				
Milk-Derived Ingredients	M-Gredient® Casein Peptone B1	Pancreatically Digested, for Biotechnology and Microbiology	1 kg 5 kg	**95039**
	M-Gredient® Casein Peptone B2	Pancreatically Digested, for Biotechnology and Microbiology	1 kg 5 kg	**82303**
	M-Gredient® Casein Peptone B3	Tryptically Digested, for Biotechnology and Microbiology	100 g 500 g	**70172**
	M-Gredient® Casein Peptone B4	Pancreatically Digested, for Biotechnology and Microbiology	250 g 1 kg	**T9410**
	M-Gredient® Casein Peptone B6	Pancreatically Digested, for Biotechnology and Microbiology	250 g 1 kg"	**T7293**
	M-Gredient® Casein Peptone B6	Enzymatically Digested, for Biotechnology and Microbiology	100 g 500 g	**22090**
	N-Z-Amine® A Casein Peptone	Enzymatically Digested, for Biotechnology and Microbiology	250 g 1 kg 5 kg 500 g	**C0626**
	N-Z-Case® Plus Casein Peptone	Enzymatically Digested, for Biotechnology and Microbiology	250 g 1 kg 5 kg	**N4642**
	N-Z-Amine® AS Casein Peptone	Enzymatically Digested, for Biotechnology and Microbiology	1 kg 5 kg	**N4517**
	M-Gredient® Casein Acid Hydrolysate	Vitamin Free, for Biotechnology and Microbiology	500 g	**C7970**
	Hy-Case® Amino Casein Acid Hydrolysate	for Biotechnology and Microbiology	100 g 1 kg"	**C0501**
	Hy-Case® SF Casein Acid Hydrolysate	for Biotechnology and Microbiology	500 g 1 kg 5 kg"	**C9386**
	Amicase® Casein Acid Hydrolysate	for Biotechnology and Microbiology	250 g 1 kg 5 kg"	**A2427**
	M-Gredient® Lactalbumin Peptone	Enzymatically Digested, for Biotechnology and Microbiology	500 g 5 kg	**61300**
	M-Gredient® Skim Milk Powder	for Biotechnology and Microbiology	500 g	**70166**
Animal-Derived Ingredients	M-Gredient® Meat Peptone B1	Pancreatically and Papain Digested, for Biotechnology and Microbiology	500 g	**91249**
	M-Gredient® Meat Peptone B2	Peptically Digested, for Biotechnology and Microbiology	100 g 500 g	**70174**
	M-Gredient® Meat Peptone B3	Pancreatically and Papain Digested, for Biotechnology and Microbiology	1 kg 5 kg	**82962**
	M-Gredient® Proteose Peptone B1	for Biotechnology and Microbiology	100 g 500 g	**82450**
	M-Gredient® Proteose Peptone B2	for Biotechnology and Microbiology	250 g 1 kg	**P0431**
	M-Gredient® Tryptose	for Biotechnology and Microbiology	500 g	**70937**
	M-Gredient® Animal Proteins Peptone	Enzymatically Digested, for Biotechnology and Microbiology	500 g	**77180**
	M-Gredient® Gelatin Peptone	Enzymatically Digested, for Biotechnology and Microbiology	100 g 500 g	**70176**
	M-Gredient® Beef Extract	for Biotechnology and Microbiology	50 g 100 g 500 g	**B4888**
	M-Gredient® Casein-Meat Peptone	Enzymatically Digested, for Biotechnology and Microbiology	500 g	**68971**
	M-Gredient® Mycological Peptone	for Biotechnology and Microbiology	500 g 25 kg"	**77199**

Overview & Pack Sizes

Group	Product Name	Suffix	Pack Sizes	Cat. No.
Specialities				
Plant-Derived Ingredients	M-Gredient® Soy Peptone B1	Papain Digested, for Biotechnology and Microbiology	100 g 500 g	**70178**
	M-Gredient® Soy Peptone B2	Enzymatically Digested, for Biotechnology and Microbiology	1 kg 5 kg	**87972**
	M-Gredient® Soy Peptone B3	Enzymatically Digested, for Biotechnology and Microbiology	1 kg 5 kg 25 kg"	**90765**
	N-Z-Soy® BL4 Soy Peptone	Enzymatically Digested, for Biotechnology and Microbiology	1 kg	**41428**
	M-Gredient® Soy Acid Hydrolysate	for Biotechnology and Microbiology	100 g 500 g 1 kg	**S1674**
	M-Gredient® Vegetable Tryptone	Vegetable Protein Enzymatically Digested, for Biotechnology and Microbiology	500 g	**16922**
	M-Gredient® Vegetable Tryptose	Vegetable Protein Enzymatically Digested, for Biotechnology and Microbiology	500 g	**12331**
	M-Gredient® Veg. Proteose Peptone	Vegetable Protein Enzymatically Digested, for Biotechnology and Microbiology	500 g	**29185**
	M-Gredient® Vegetable Peptone B4	Corn and Rice Protein Enzymatically Digested, for Biotechnology and Microbiology	500 g	**61854**
	M-Gredient® Vegetable Peptone B5	Pea and Wheat Peptone Enzymatically Digested, for Biotechnology and Microbiology	500 g 5 kg"	**18332**
Plant-Derived Ingredients	M-Gredient® Vegetable Peptone B6	Corn and Wheat Protein Enzymatically Digested, for Biotechnology and Microbiology	500 g	**19942**
	M-Gredient® Vegetable Peptone B7	Soy and Wheat Protein Enzymatically Digested, for Biotechnology and Microbiology	500 g	**07436**
	M-Gredient® Vegetable Infusion	for Biotechnology and Microbiology	500 g	**95757**
	M-Gredient® Potato Peptone	Enzymatically Digested, for Biotechnology and Microbiology	500 g	**83059**
	M-Gredient® Potato Infusion Powder	for Biotechnology and Microbiology	500 g 2.5 kg	**52424**
	M-Gredient® Pea Peptone	Enzymatically Digested, for Biotechnology and Microbiology	500 g	**96174**
	M-Gredient® Malt Extract	for Biotechnology and Microbiology	500 g	**70167**
	M-Gredient® Wheat Peptone	Enzymatically Digested, for Biotechnology and Microbiology	500 g	**93492**
Yeast Ingredients	M-Gredient® Yeast Extract B1	for Biotechnology and Microbiology	50 g 100 g 500 g 2.5 kg	**70161**
	M-Gredient® Yeast Extract B2	for Biotechnology and Microbiology	2.5 kg	**55535**
	M-Gredient® Yeast Peptone B1	Enzymatically Digested, Powder, for Biotechnology and Microbiology	500 g	**68707**
	M-Gredient® Yeast Peptone B2	Enzymatically Digested, Powder, for Biotechnology and Microbiology	500 g	**68727**
	M-Gredient® Yeast Peptone B3	Enzymatically Digested, Powder, for Biotechnology and Microbiology	250 g	**68728**
	M-Gredient® Yeast Peptone B4	Enzymatically Digested, Powder, for Biotechnology and Microbiology	250 g	**68759**
	M-Gredient® Yeast Peptone B5	Enzymatically Digested, Micro-Agglomerated, for Biotechnology and Microbiology	250 g	**69088**
	M-Gredient® Yeast Peptone B6	Enzymatically Digested, Micro-Agglomerated, for Biotechnology and Microbiology	250 g	**69134**
	M-Gredient® Yeast Peptone B7	Enzymatically Digested, Micro-Agglomerated, for Biotechnology and Microbiology	250 g	**69259**

QC Parameters

Cat. No.	Product Name	Total N	Amino N	Ash / Residue on Ignition	Loss on drying	pH
Prime						
107213	M-Gredient® Casein Peptone A1	12.0–14.0%	3.0–5.0%	≤15%	≤6%	6.7–7.7
102239	M-Gredient® Casein Peptone A2	13.8–15.8%	4.7–6.7%	≤5%	≤6.5%	5.0–6.0
111931	M-Gredient® Casein Peptone A3	12–14%	3.0–5.0%	≤15%	≤6%	6.7–7.7
112523	M-Gredient® Lactalbumin Peptone	≥10%	5.0–6.0	≤15%	≤7%	6.5–7.5
102245	M-Gredient® Casein Acid Hydrolysate	7.0–8.5%	5.0–6.5%	≤58%	≤6%	4.7–7.0
113231	M-Gredient Casein Peptone A4	12.0-14.0%	3.0-5.0%	≤15%	≤6%	6.7–7.7
115363	M-Gredient® Skim Milk Powder			≤10%		6.0–7.0
107214	M-Gredient® Meat Peptone A1	11.0–14.0%	3.4–5.0%	≤17%	≤6%	6.5–7.5
107224	M-Gredient® Meat Peptone A2	11.0–14.0%	3.0–5.0%	≤15%	≤6%	6.5–7.5
107229	M-Gredient® Proteose Peptone	≥12%	6.5–7.5%	≤15%	≤10%	6.5–7.5
110213	M-Gredient® Tryptose	11.0–13.0%	3.0–5.0%	≤15%		6.5–7.5
107284	M-Gredient® Gelatin Peptone	15.5–17.0%	6.5–7.5%	≤15%	≤6%	6.5–7.5
107043	M-Gredient® Universal Mixed Peptone M 66		≥3.5%	≤15%	≤5%	6.0–7.0
103979	M-Gredient® Meat Extract	11.5–12.5%	3.5–4.5%	≤18%	≤6%	6.0–7.5
107212	M-Gredient® Soy Peptone A1	9.3–10.7%	1.8–3.2%	≤15%	≤6%	6.5–7.5
111932	M-Gredient® Soy Peptone A2	9.3–10.7%	1.8–3.2%	≤15%	≤6%	6.5–7.5
105391	M-Gredient® Malt Extract			≤3%	≤6%	4.5–6.0
103753	M-Gredient® Yeast Extract A1	≥10.5%		≤17%	≤5%	5.5–7.2
113885	M-Gredient® Yeast Extract A2	≥10.5%		≤17%	≤5%	5.5–7.2
117257	M-Gredient® Yeast Extract A3	≥10.7%	≥4.8%	≤18%	≤6%	6.7–7.3
Specialities						
95039	M-Gredient® Casein Peptone B1	≥12%	≥3.5%	≤17%	≤6%	6.5–7.5
82303	M-Gredient® Casein Peptone B2	~13%	≥3%	≤17%	≤6%	6.5–7.5
70172	M-Gredient® Casein Peptone B3	≥11%	≥3.5%	≤15%	≤8%	6.2–7.2
T9410	M-Gredient® Casein Peptone B4	11.4–13.9%			≤5%	6.6–7.4
T7293	M-Gredient® Casein Peptone B6	11.0–16.0%			≤6%	6.9–7.4
22090	M-Gredient® Casein Peptone B6	≥11%	≥6%	≤8%	≤6%	6.0–7.0
C0626	N-Z-Amine® A Casein Peptone	≥11%	≥6%		≤5%	
N4642	N-Z-Case® Plus Casein Peptone	≥10%	≥6%		≤5%	
N4517	N-Z-Amine® AS Casein Peptone	≥11%	≥6%			
C7970	M-Gredient® Casein Acid Hydrolysate	≥7%	≥4.6%	≤42%	≤5%	5.0–7.0
C0501	Hy-Case® Amino Casein Acid Hydrolysate	≥7.8%	5.2–7.7%		≤4%	
C9386	Hy-Case® SF Casein Acid Hydrolysate	≥12.5%	8–12%		≤5%	
A2427	Amicase® Casein Acid Hydrolysate	≥12%	≥9%	≤2%		
61300	M-Gredient® Lactalbumin Peptone	≥11%		≤10%	≤6%	6.3–7.3
70166	M-Gredient® Skim Milk Powder	4.7–6.0%	–	≤10%	≤5%	
91249	M-Gredient® Meat Peptone B1	≥14%	≥3%	≤8%	≤6%	6.5–7.6
70174	M-Gredient® Meat Peptone B2	≥10%	≥2%	≤12%	≤6%	6.5–7.5
82962	M-Gredient® Meat Peptone B3	≥14%	≥2.7%	≤6 %	≤6%	5.0–6.0
82450	M-Gredient® Proteose Peptone B1	≥11%	≥3%	≤20%	≤6%	6.0–8.0
P0431	M-Gredient® Proteose Peptone B2	10.0–15.5%			≤5%	6.6–7.6
70937	M-Gredient® Tryptose	≥11%	≥3.5	≤12%	≤8%	6.2–7.2
77180	M-Gredient® Animal Proteins Peptone	≥10%	≥2.5%	≤22%	≤6%	6.5–7.5
70176	M-Gredient® Gelatin Peptone	≥15%	≥2.2%	≤10%	≤6%	6.5–7.5
B4888	M-Gredient® Beef Extract	≥8%		≤15%	≤7%	6.5–7.5
68971	M-Gredient® Casein-Meat Peptone	≥12%	≥3.5%	≤15%	≤6%	6.0–8.0
77199	M-Gredient® Mycological Peptone	≥9%	≥2.8%	≤15%	≤6%	5.0–7.0
70178	M-Gredient® Soy Peptone B1	≥8%	≥2%	≤22%	≤6%	6.6–7.6

QC Parameters

Cat. No.	Product Name	Total N	Amino N	Ash / Residue on Ignition	Loss on drying	pH
Specialities						
87972	M-Gredient® Soy Peptone B2	≥8%	≥2%	≤22%	≤6%	6.4–7.8
90765	M-Gredient® Soy Peptone B3	≥8%	≥3%	≤20%	≤10%	6.3–7.3
41428	N-Z-Soy® BL4 Soy Peptone	≥12%	≥2.4%	≤10%	≤6%	4.0–5.0
S1674	M-Gredient® Soy Acid Hydrolysate	≥12%	≥9%	≤10%	≤5%	
16922	M-Gredient® Vegetable Tryptone	≥11%	≥2.0%	≤15%	≤7%	5.5–7.5
12331	M-Gredient® Vegetable Tryptose	≥11%	≥3%	≤15%	≤7%	6.1–7.1
29185	M-Gredient® Veg. Proteose Peptone	≥10%	≥3.2%	≤12%	≤6%	6.1–7.1
61854	M-Gredient® Vegetable Peptone B4	≥11%	≥3%	≤11%	≤7%	6.1–7.1
18332	M-Gredient® Vegetable Peptone B5	≥8%	≥3%	≤15%	≤6%	6.1–7.1
19942	M-Gredient® Vegetable Peptone B6	≥10%	≥2.5%	≤12%	≤6%	6.1–7.1
07436	M-Gredient® Vegetable Peptone B7	≥11%	≥3%	≤12%	≤6%	6.1–7.1
95757	M-Gredient® Vegetable Infusion	≥9%	≥3%	≤15%	≤8%	6.5–7.5
83059	M-Gredient® Potato Peptone	≥9.5%	≥4.5%	≤22%	≤6%	6.5–7.5
52424	M-Gredient® Potato Infusion Powder	≥3%	≥2%	≤22%	≤8%	5.0–7.0
96174	M-Gredient® Pea Peptone	≥13%	≥3.5%	≤16.0%	≤6%	6.7–7.7
70167	M-Gredient® Malt Extract			≤4.5%	≤7%	5.0–6.0
93492	M-Gredient® Wheat Peptone	≥10%	≥2.0%	≤24%	≤6%	6.0–8.0
70161	M-Gredient® Yeast Extract B1	≥10%	≥4.5%	≤15%	≤6%	6.8–7.2
55535	M-Gredient® Yeast Extract B2	≥10%	≥4.5%	≤16%	≤6%	6.8–7.2
68707	M-Gredient® Yeast Peptone B1	≥11%	≥4.6%	≤18%	≤7%	6.3–7.3
68727	M-Gredient® Yeast Peptone B2	≥10.4%	≥5%		≤7%	5.5–5.9
68728	M-Gredient® Yeast Peptone B3	≥10%	≥1.3%		≤7%	6.2–7.2
68759	M-Gredient® Yeast Peptone B4	≥9.5%	≥2.2%		≤7%	6.3–7.3
69088	M-Gredient® Yeast Peptone B5	≥7.5%	≥5%		≤7%	5.1–6.1
69134	M-Gredient® Yeast Peptone B6	≥10%	≥3.5%		≤7%	6.4–7.2
69259	M-Gredient® Yeast Peptone B7	≥7.1%	≥4%		≤7%	5.5–6.5

Elements

Cat. No.	Product Name	Potassium	Sodium	Magnesium	Phosphate/ Phosphorus compounds	Calcium	Chloride	Total Carbohydrate
Prime								
107213	M-Gredient® Casein Peptone A1					≤0.1%	0.8%*	
102239	M-Gredient® Casein Peptone A2			<0.02%*		<0.20%*	0.3%*	0.4%*
111931	M-Gredient® Casein Peptone A3	0.86%*	2.20%*	<0.01%*		0.02%*		
112523	M-Gredient® Lactalbumin Peptone	0.83%	2.1%	≤0.1%	≤1.5%	≤0.2%		
132373	M-Gredient Casein Peptone A4					≤0.1%		
102245	M-Gredient® Casein Acid Hydrolysate						40.3%*	
115363	M-Gredient® Skim Milk Powder							
107214	M-Gredient® Meat Peptone A1	2.7%*	2.5%*	0.03%*		0.07%*		
107224	M-Gredient® Meat Peptone A2							
107229	M-Gredient® Proteose Peptone							
110213	M-Gredient® Tryptose							
107284	M-Gredient® Gelatin Peptone					≤0.2%		
107043	M-Gredient® Universal Mixed Peptone M 66							
103979	M-Gredient® Meat Extract							
107212	M-Gredient® Soy Peptone A1						0.2%*	~20%*
111932	M-Gredient® Soy Peptone A2						0.2%*	~20%*
105391	M-Gredient® Malt Extract							
103753	M-Gredient® Yeast Extract A1	≤5%*		≤0.1%	≤2.5%	≤0.05%	≤5.0%	
113885	M-Gredient® Yeast Extract A2	≤5%*		≤0.1%	≤2.5%	≤0.05%		
117257	M-Gredient® Yeast Extract A3	≤5%	≤0.5%	≤0.6%	≤1.5%	≤0.1%		

*Typical Values

Amino Acid Distribution (mg/g)

Cat. No.	Product Name	Alanine	Arginine	Aspartic acid	Cystine	Glutamic acid	Glycine	Histidine
Prime								
107213	M-Gredient® Casein Peptone A1	27.4	32.8	61	–	190	17.2	24.4
102239	M-Gredient® Casein Peptone A2	19	30	64	–	174	32	27
111931	M-Gredient® Casein Peptone A3	27.4	32.9	69.9	4.9	192.3	17.3	24.4
112523	M-Gredient® Lactalbumin Peptone	32	13.6	75.9	7.6	171.2	18.3	20.2
102245	M-Gredient® Casein Acid Hydrolysate	2	2.2	4.4	–	12.5	1.2	1.8
132373	M-Gredient Casein Peptone A4							
107214	M-Gredient® Meat Peptone A1	63.6	48.8	66.3	4.3	118	108	12.5
107224	M-Gredient® Meat Peptone A2	86	75	57.4	1.1	98	184	7.5
107229	M-Gredient® Proteose Peptone	33.5	30.2	62.7	5.2	144.5	23.1	18.4
110213	M-Gredient® Tryptose	30.6	31.0	65.5	5.4	164.9	20.3	20.8
107284	M-Gredient® Gelatin Peptone	76	69	51	10	87	200	5
107043	M-Gredient® Universal Mixed Peptone M 66	29.2	36.4	70.1	4.6	185.2	23.4	24.4
103979	M-Gredient® Meat Extract	40	38	62	7	124	37	17
107212	M-Gredient® Soy Peptone A1	26.9	86.5	78.2	–	124	47.7	36.4
111932	M-Gredient® Soy Peptone A2	26.9	86.5	78.2	–	124	47.7	36.4
105391	M-Gredient® Malt Extract	4	5	9	–	16	4	6
103753	M-Gredient® Yeast Extract A1	36	23	51	11	95	24	10
113885	M-Gredient® Yeast Extract A2	36	23	51	11	95	24	10
117257	M-Gredient® Yeast Extract A3	54	45	68	14	126	31	15

Molecular Weight Distribution

Cat. No.	Product Name	50 Da	100 Da	150 Da	200 Da	250 Da	300 Da	350 Da	400 Da	450 Da	500 Da
Prime											
107213	M-Gredient® Casein Peptone A1			27.40%			24.76%				
102239	M-Gredient® Casein Peptone A2		14.68%			36.98%					
111931	M-Gredient® Casein Peptone A3					58.30%					
112523	M-Gredient® Lactalbumin Peptone					69.00%					
102245	M-Gredient® Casein Acid Hydrolysate			50.90%			42.50%				
107214	M-Gredient® Meat Peptone A1					88.90%					
107224	M-Gredient® Meat Peptone A2					38.70%					
107229	M-Gredient® Proteose Peptone					69.57%					
110213	M-Gredient® Tryptose					63.90%					
107284	M-Gredient® Gelatin Peptone			8.90%			18.90%				
107043	M-Gredient® Universal Mixed Peptone M 66					60.31%					
103979	M-Gredient® Meat Extract			28.10%			21.60%				
107212	M-Gredient® Soy Peptone A1			48.76%			19.13%				
111932	M-Gredient® Soy Peptone A2			48.76%			19.13%				
105391	M-Gredient® Malt Extract	4.21%								75.54%	
103753	M-Gredient® Yeast Extract A1		39.15%			29.96%					
113885	M-Gredient® Yeast Extract A2		39.15%			29.96%					
117257	M-Gredient® Yeast Extract A3		41.30%			26.47%					

Isoleucine	Leucine	Lysine	Methionine	Phenylalanine	Proline	Serine	Threonine	Tryptophan	Tyrosine	Valine
44.2	77.7	68.8	23.9	43.1	94.3	46.4	37.6	11.4	19.1	56.2
43.3	72	65	24.2	40	84	42.1	34.4	–	20	51
45.2	77	67.3	24.5	41.8	91.1	51.4	39.5	10.0	19.1	55.9
43	65.2	66.8	16	30.8	73.7	47.2	45.8	11.7	9.7	50.7
2.4	3.4	5.6	1.2	2.5	6.1	2.7	2.2	–	0.6	3.9
29.6	48.6	49.4	7.8	28	79.3	37.1	29.6	–	11.5	37.5
14.6	35.5	34.4	6.2	21.7	110	32.7	19.8	–	7.7	23.4
36.6	59.2	55.4	13.4	33.4	57.6	39.3	33.7	7.8	15.3	44.6
40.3	66.7	60.3	18.2	37.0	71.5	44.3	21.4	3.4	16.8	49.3
11	21	33	9	21	111	32	15	–	7	20
43.6	74.1	65.0	22.9	40.6	87.6	49.7	11.7	–	19.0	53.6
30	48	53	20	29	45	31	32	7	17	39
28.2	47.1	39.1	8.2	31.2	33.4	31.8	23.9	–	25.5	28.2
28.2	47.1	39.1	8.2	31.2	33.4	31.8	23.9	–	25.5	28.2
5	6	6	2	7	6	4	4	–	3	6
28	39	40	3	25	17	24	27	1	10	31
28	39	40	3	25	17	24	27	1	10	31
35	51	54	2	31	26	35	41	5	11	40

550 Da	600 Da	650 Da	700 Da	750 Da	800 Da	900 Da	1 kDa	2 kDa	3 kDa	5 kDa	10 kDa	15 kDa	>20 kDa
38.41%							9.32%		0.11%				
34.90%					12.29%				1.15%				
14.20%				27.00%					0.40%	0.10%			0.00%
17.80%				13.20%					0.00%				
6.40%							0.20%						
9.70%				1.40%					0.00%				
13.90%				5.50%					1.90%				0.00%
29.86%									0.57%		0.00%		
35.42%									0.68%				
38.80%							33.50%				0.00%		
39.05%									0.55%				
22.30%							28.00%				0.00%		
20.30%							8.03%		3.78%				
20.30%							8.03%		3.78%				
					6.44%		8.76%		2.05%				
10.14%					3.76%		14.40%		2.58%		0.00%		
10.14%					3.76%		14.40%		2.58%		0.00%		
10.12%					3.66%		13.66%		2.87%		0.00%		1.92%

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