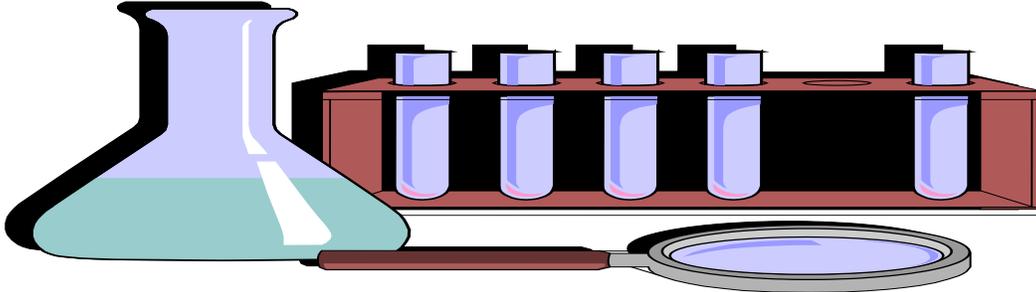


Ultrateck SA de CV

Ultrateck Fermentation Manufacturers Ingredients - Enzyme Division



Ultrateck Enzyme Information



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Name	Application	Origin	Description	Activity	pH	Celsius
Alkaline Protease *	Food Grade Cleaning & Wastewater Food & Beverage Other	<i>Bacillus licheniformis</i>	An endoprotease capable of hydrolyzing a broad range of peptide bonds. Typically used in detergents, silver recovery, and fish stick water.	400,000 PC/g	7.0 - 10.0	45 - 65
Alpha Galactosidase	Food Grade Dietary Supplement Food & Beverage Other	<i>Aspergillus niger</i>	An enzyme capable of breaking down sugars such as stachyose, melibiose, and raffinose. Typically used in soybean processing, soy based animal feeds and dietary supplements.	15,000 GalU/g	3.0 - 6.0	40 - 60
Amyloglucosidase * (Glucoamylase)	Food Grade Baking Dietary Supplement Food & Beverage Other	<i>Aspergillus niger</i>	An enzyme that can cleave individual glucose units from the non-reducing ends of starch chains. Typically used in baking, brewing, dextrose production, alcohol fermentations, dietary supplements and other food grade applications.	1,000 AG/g	3.0 - 5.0	50 - 65
Bacterial Alpha Amylase *	Food Grade Baking Cleaning & Wastewater Food & Beverage Other	<i>Bacillus subtilis</i>	An alpha amylase that works at a higher pH and temperature range than Fungal Alpha Amylase. Typically used in baking, brewing, dietary supplements, animal feed, and other food grade applications.	300,000 BAU/g	5.0 - 7.0	30 - 85

Beta Glucanase *	Food Grade Baking Dietary Supplement Food & Beverage Other	<i>Trichoderma longibrachiatum</i>	An enzyme capable of hydrolyzing beta glucans. Typically used in baking, brewing, food processing, animal feed, and dietary supplements.	3,000 BGU/g	4.0 - 6.5	40 - 70
Bifidobacterium longum	Food Grade Dietary Supplement Other	<i>Bifidobacterium longum</i>	A probiotic used in dietary supplements for humans and animals.	150 Billion CFU/g	-	-
Bromelain	Food Grade Baking Dietary Supplement Food & Beverage Other	<i>Ananas comosus</i>	An enzyme capable of broad specificity protein hydrolysis over a wide pH range. Typically used as a meat tenderizer and in pet food production.	2,000 GDU/g	4.0 - 8.0	45 - 60
CalfLak Plus	Animal Feed Other	<i>Enzyme / Bacteria Blend</i>	A blend of enzymes and bacteria designed as a digestive supplement for calves.	Upon Request	-	-
Cellulase *	Food Grade Baking Cleaning & Wastewater Dietary Supplement Food & Beverage Other	<i>Trichoderma longibrachiatum</i>	An enzyme capable of hydrolyzing cellulose. Typically used in food processing, animal feed, dietary supplements, and other food grade applications. Also suitable for wastewater treatment.	150,000 CU/g	3.0 - 6.0	35 - 70

Cellulase-AN	Food Grade Cleaning & Wastewater Dietary Supplement Food & Beverage Other	<i>Aspergillus niger</i>	An enzyme capable of hydrolyzing cellulose. Typically used in food processing, animal feed, dietary supplements, and other food grade applications. Also suitable for wastewater treatment.	50,000 CU/g	4.0 - 5.5	40 - 65
Fungal Acid Protease	Food Grade Dietary Supplement Food & Beverage Other	<i>Aspergillus oryzae</i>	An enzyme capable of hydrolyzing protein to peptides and amino acids in lower pH applications. Typically used in dietary supplements and flavor manufacture.	500,000 HUT/g	3.0 - 6.0	25 - 60
Fungal Alpha Amylase *	Food Grade Baking Dietary Supplement Food & Beverage Other	<i>Aspergillus oryzae</i>	An alpha amylase enzyme that is capable of hydrolyzing starch. Typically used in baking, brewing, dietary supplements, potable alcohol production and other food grade applications.	100,000 SKB/g	4.0 - 6.0	40 - 65
Fungal Lactase	Food Grade Dietary Supplement Food & Beverage Other	<i>Aspergillus oryzae</i>	An enzyme capable of cleaving lactose. Typically used in dietary supplements and food processing.	100,000 ALU/g	3.0 - 5.0	35 - 55

Fungal Protease	Food Grade Baking Dietary Supplement Food & Beverage Other	<i>Aspergillus oryzae</i>	An enzyme capable of hydrolyzing proteins to peptides and amino acids. Typically used in baking, flavor development (cheeses), and other food grade applications.	400,000 HU/g	6.0 - 9.0	25 - 60
Hemicellulase *	Food Grade Baking Dietary Supplement Food & Beverage Other	<i>Aspergillus niger</i>	An enzyme capable of hydrolyzing hemicellulose. Typically used in baking, animal feed, and dietary supplements.	400,000 HCU/g	3.5 - 6.0	40 - 75
Lactoacillus casei	Food Grade Dietary Supplement	<i>Lactobacillus casei</i>	A probiotic used in dietary supplements for humans and animals.	150 Billion CFU/g	-	-
Lactobacillus acidophilus	Food Grade Dietary Supplement Other	<i>Lactobacillus acidophilus</i>	A probiotic used in dietary supplements for humans and animals.	150 Billion CFU/g	-	-
Neutral Protease	Food Grade Baking Food & Beverage Other	<i>Bacillus subtilis</i>	An enzyme capable of hydrolyzing protein to peptides and amino acids. Typically used in pet food and flavor manufacture.	2,000,000 PC/g	6.0 - 8.0	40 - 60
Papain	Food Grade Baking Dietary Supplement Food & Beverage Other	<i>Carica Papaya</i>	An enzyme capable of broad specificity protein hydrolysis over a wide pH range. Typically used as a meat tenderizer and in pet food production.	800 TU/MG	4.0 - 9.0	35 - 60

Pectinase *	Food Grade Dietary Supplement Food & Beverage Other	<i>Aspergillus niger</i>	An enzyme capable of hydrolyzing fruit pectin. Typically used in fruit juice and wine production.	500,000 AJDU/g	3.5 - 6.0	40 - 55
Phytase	Food Grade Other	<i>Aspergillus niger</i>	An enzyme that is capable of hydrolyzing phytic acid to liberate phosphorus. Typically used in animal feed to improve feed efficiency and reduce phosphorus in waste products.	1,500 U/g	4.5 - 6.0	45 - 55
Xylanase	Food Grade Baking Dietary Supplement Food & Beverage Other	<i>Trichoderma longibrachiatum</i>	An enzyme that hydrolyzes xylan. Typically used in food processing, animal feed, and dietary supplements.	150,000 XU/g	- 4.0 - 6.5	- 40 - 60

Name	Application	Origin	Description	Activity	pH	° Celsius
Dextranase	Other	<i>Chaetomium erraticum</i>	A liquid enzyme capable of removing problematic dextrans by hydrolysis. Typically used in the sugar (beet and cane) industry.	30,000 U/mL	4.0 - 6.5	40 - 65
Fungal Acid Protease	Other Food & Beverage Dietary Supplements Animal Feed	<i>Aspergillus oryzae</i>	An enzyme capable of hydrolyzing protein to peptides and amino acids in lower pH applications. Typically used in dietary supplements and flavor manufacture.	500,000 HUT/g	3.0 - 6.0	25 - 60

Fungal Alpha Amylase *	Other Food & Beverage Dietary Supplements Baking Animal Feed	<i>Aspergillus oryzae</i>	An alpha amylase enzyme that is capable of hydrolyzing starch. Typically used in baking, brewing, dietary supplements, potable alcohol production and other food grade applications.	100,000 SKB/g	4.0 - 6.0	40 - 65
Fungal Lactase	Other Food & Beverage Dietary Supplements Animal Feed	<i>Aspergillus oryzae</i>	An enzyme capable of cleaving lactose. Typically used in dietary supplements and food processing.	100,000 ALU/g	3.0 - 5.0	35 - 55
Fungal Protease	Other Food & Beverage Dietary Supplements Baking Animal Feed	<i>Aspergillus oryzae</i>	An enzyme capable of hydrolyzing proteins to peptides and amino acids. Typically used in baking, flavor development (cheeses), and other food grade applications.	400,000 HU/g	6.0 - 9.0	25 - 60
Glucose Oxidase	Food & Beverage Other	<i>Aspergillus niger</i>	An enzyme that converts glucose (dextrose) to gluconic acid. Typically used in the food and beverage industries to stop non-enzymatic browning and act as an oxygen scavenger	15,000 U/g	5.0 - 8.0	20 - 60
Grease Trap Bio-Eliminator	Cleaning & Wastewater Other	<i>Selected Microorganisms</i>	A blend of microorganisms capable of eliminating fat and oil clogs in drain lines and grease traps.	Various Formulas	-	-
Hemicellulase	Other Food & Beverage Dietary Supplements Baking	<i>Aspergillus niger</i>	An enzyme capable of hydrolyzing hemicellulose. Typically used in baking, animal feed, and dietary supplements.	400,000 HCU/g	3.5 - 6.0	40 - 75
Invertase *	Other Food & Beverage Dietary Supplements Baking	<i>Saccharomyces cerevisiae</i>	An enzyme capable of hydrolyzing sucrose into glucose and fructose. Typically used in manufacturing confectionaries, dietary supplements, and other food grade applications.	200,000 Sumner/g	3.5 - 5.5	10 - 65

Name	Application	Origin	Description	Activity	pH	° Celsius
Neutral Protease	Other Food & Beverage Baking Animal Feed	<i>Bacillus subtilis</i>	An enzyme capable of hydrolyzing protein to peptides and amino acids. Typically used in pet food and flavor manufacture.	2,000,000 PC/g	6.0 - 8.0	40 - 60
Papain	Other Food & Beverage Dietary Supplements Baking Animal Feed	<i>Carica Papaya</i>	An enzyme capable of broad specificity protein hydrolysis over a wide pH range. Typically used as a meat tenderizer and in pet food production.	800 TU/MG	4.0 - 9.0	35 - 60
Pectinase	Other Food & Beverage Dietary Supplements Animal Feed	<i>Aspergillus niger</i>	An enzyme capable of hydrolyzing fruit pectin. Typically used in fruit juice and wine production.	500,000 AJDU/g	3.5 - 6.0	40 - 55
Peptidase	Other Food & Beverage Dietary Supplements	<i>Aspergillus oryzae</i>	An enzyme capable of catalyzing the removal of peptides from the ends of protein chains. Typically used to debitter protein hydrolysates.	500 LAP/g	5.5 - 8.5	30 - 60
Phytase	Animal Feed Other	<i>Aspergillus niger</i>	An enzyme that is capable of hydrolyzing phytic acid to liberate phosphorus. Typically used in animal feed to improve feed efficiency and reduce phosphorus in waste products.	1,500 U/g	4.5 - 6.0	45 - 55
Polyase Plus	Animal Feed Other	<i>Enzyme / Bacteria Blend</i>	A blend of enzymes and bacteria designed for use as a poultry supplement to increase feed efficiency.	Upon Request	-	-
Xylanase	Other Food & Beverage Dietary Supplements Baking Animal Feed	<i>Trichoderma longibrachiatum</i>	An enzyme that hydrolyzes xylan. Typically used in food processing, animal feed, and dietary supplements.	150,000 XU/g	4.0 - 6.5	40 - 60

Also available in liquid form *
Blends can be formulated to meet client specifications
All the above ingredients are in concentrated form
Pricing available according to client request



Digestion & Absorption

In general foods must be broken down (hydrolyzed) or simplified chemically before they can be assimilated by the body. This is true of the carbohydrates, fats, and proteins, it is not true of water and inorganic ions, for they pass from the digestive tract and are absorbed in their original form. This simplification or breakdown of food is accomplished by the action of different enzymes, which are active in the mouth, esophagus, stomach and the small and large intestines.

Scientists estimate that the human body produces over 100,000 different types of enzymes each one accomplishing an entirely independent function in sustaining life. The enzymes produced in the pancreas and small intestine which are so important in digestion are protease (act on protein), lipase (act on fat) and amylase (act on starch). These enzymes catalyze (bring about) the hydrolysis of native protein to amino acids, starches to simple sugar, and fats to glycerol and fatty acids. It is probable in the course of these digestive reactions that minerals and vitamins of food and other things are also made more assimilable. This is certainly true of fat-soluble vitamins, which are not absorbed unless fat digestion is proceeding normally.

The physiological activity of man changes greatly with advancing years. Age brings in a gradual retardation of cell division, cell excretions and overall body function. Studies have shown that 35 % of people over 60 years old have some sort of digestive malfunction. In fact disturbances of the entire alimentary tract rank second only to cardiovascular disorders as causes of morbidity in the aged.

Good health at any age, and especially in the old, depends on proper nutrition. Since efficient digestion is a prerequisite for adequate absorption then if sufficient enzymes to breakdown food are not produced by the body in the pancreas, stomach, and small intestine then complications such as weight loss, flatulence, chronic constipation, non-infectious diarrhea and abdominal discomfort will occur.

The Function of Enzymes

To understand the function of an enzyme without getting into a complex discussion of molecular chemistry simply consider the enzyme as similar to a knife slicing a loaf of bread. The knife, "undergoing no change" acts as a catalyst causing a "chemical reaction" The breaking down of the loaf of bread - Thereby putting the bread into a more useful form. Essentially, enzymes accomplish what the knife does in our example. Their catalytic action breaks down food into particles small enough to be absorbed and used by the body.

To fully appreciate how important and efficient enzymes are, consider the following. In order for a chemist to break down the white of an egg, which is protein in nature, he must first add to it about ten times its weight in concentrated acid. He must then boil this mixture for twenty hours!

Enzymes play a role in virtually all biochemical processes that take place in the human body everyday. Without them, life could not continue, even in the presence of sufficient amounts of vitamins, minerals, and other nutrients. Essentially, enzymes are complex protein structures that have a specific shape and function. Their high specificity for a particular substance (the substances that enzymes act on are often referred to as substrates) means that a multitude of enzymes must be produced to carry out the reactions between the many different substrates within the body. Enzymes truly are the "engines of life."

The function of enzymes are to act as catalysts, that is, to facilitate or speed up the reaction between products that would otherwise not occur or would proceed at a very slow rate. too slow to sustain life. Imagine how long it would take to digest breakfast without enzymes, perhaps months or even years. Enzymes speed up these reactions so that the digestion of food takes place in just hours. Enzymes themselves fall under two categories: metabolic and digestive. Metabolic enzymes catalyze the various chemical reactions within the cells such as energy production and detoxification.

Digestive enzymes, as the name implies, breakdown food, enabling nutrients to be absorbed from the gastrointestinal tract. There are hundreds, if not thousands of metabolic enzymes but only three basic types of digestive enzymes: amylase, protease, and lipase. Amylase, found in the saliva and pancreatic digestive juices, breakdown carbohydrates, particularly starches, into smaller units called saccharides (sac-a-rides). Protease facilitate the breakdown of proteins to amino acids and smaller protein units (such as dipeptides and tripeptides) and are found in the stomach as well as pancreatic secretions. Lipase breaks down fat from the diet into diglycerides, triglycerides, free fatty acids, glycerin, and various other lipid subunits. Lipid digestion occurs primarily in the small intestines and to some extent in the stomach. The body is only able to absorb nutrients that have been broken down sufficiently enough to pass through the intestinal wall. Thus, the body is only able to absorb nutrients with the aid of enzymes.

Carbohydrate Digestive Enzymes : Amylase enzyme, or more specifically alpha-amylase, is a carbohydrate-degrading enzyme produced by fermentation of *Aspergillus oryzae*. Alpha-amylase is effective in acidic environments, such as the stomach, where other amylase enzymes tend to be less stable. This particular enzyme's activity is measured in Sandstedt Kneen Blish Units (SKBU)

Examples:

Alpha Galactosidase: Gas Flatulence Alpha-galactosidase (AGS) is produced by the controlled fermentation of *Aspergillus niger* and is characterized by its ability to hydrolyze the chemical bonds (alpha 1-6 bonds) found in melibiose, raffinose, and stachyose. These carbohydrates are widely distributed in plants, mainly beans, legumes, seeds, roots, soy products, and underground stems. AGS can be used in any application where the hydrolysis of these particular carbohydrates is desired. AGS activity is measured in Alpha Galactosidase Units (AGSU)

Bromelain is probably important as an anti-inflammatory enzyme useful in post traumatic responses and swelling and after surgery. It is also part of an antiaging program as it reduces tissue irritation. This proteolytic enzyme of pineapple also has several actions that make it helpful in the prevention and treatment of cardiovascular disease. It reduces platelet aggregation, arterial plaqueing, and clot formation 400 - 1,000 mg. daily has been shown to reduce the symptoms of angina pectoris. Bromelain's most popular use has been to reduce joint inflammation in rheumatoid arthritis. The ranges for bromelain's anti-inflammatory effects appear to be from 500 - 2,000 mg. daily, usually taken in two doses. More research is needed to clearly evaluate the potential medical uses of this enzyme as well as those secreted by the pancreas itself.

Papain: Papain is a proteolytic (protein degrading) enzyme preparation isolated from the *Carica papaya* fruit. It is characterized by the ability to hydrolyze large proteins into smaller peptides and amino acids. Its broad substrate specificity and ability to hydrolyze small peptides as well as large proteins make papain an ideal enzymatic supplement. Papain activity is measured in the Food Chemical Codex Papain Unit (FCC PU). The utilization of proteolytic enzymes in medicine and pharmacology has been well documented by studies in animal and human nutrition. Papain, for example, when added to the feed or dogs on a soybean protein diet caused significant increases in digestive efficiency Papain has a mild, soothing effect on the stomach and aids in protein digestion.

Pancreatin helps to break down lipids (fat). Even though the pancreas produces most of these enzymes, at times it may be stressed or unable to produce the quantities that may be needed for controlling many unwanted processes in the body. It also helps stop gas before it starts from beans, broccoli, onions, whole grains, pasta, and many other foods. **The pancreas secretes lipases, amylases, and proteases such as trypsin and chymotrypsin.** Individual enzymes can be extracted and then added to nutritional formulas, but usually the best support is with the whole (glandular) pancreas. Of all enzyme treatment, pancreatic enzyme support has the greatest potential in medicine. Preliminary research on pancreatic enzymes suggests a favorable response to all those problems mentioned. Furthermore, cancer may be influenced by high dosages of pancreatic enzymes. Many doctors believe that pancreatic insufficiency is at the root of many degenerative diseases, including cancer.

Recent studies point out that the use of Phytase NSP Blend could have a significant effect on the absorption of divalent cations such as calcium, magnesium and iron. (Phytic acid forms insoluble complexes with cations). By virtue of its chemical nature the negatively charged phytic acid readily binds to positively charged molecules such as cations and also proteins. Phytic acid is often classified as an "anti-nutritional factor." Plant phytates (phytic acid) is found in many plants such as corn, corn by-products, legumes, soybeans and cereal grains. By utilizing **phytase in a digestive preparation it eliminates the possibility of insoluble complexes** being formed and thus increases the adsorption of the cations previously mentioned. It also hydrolyzes the bound phosphorus groups, which in turn are absorbed along with the Calcium, Iron, Magnesium and Zinc.

NOTE: Information provided herein is for educational use only, and is not intended as medical advice. If you have any serious health concerns you should always check with your health care practitioner before self-administering remedies. This information has not been evaluated by the US Food and Drug Administration. These products are not intended to treat, cure or diagnose any medical condition.