

Total-Gest

*High Potency Enzyme Formula
for TOTAL DIGESTION of all major food groups!*

Features of Total-Gest:

- 1. POWERFUL:** Contains the highest combined enzyme potency (activity) per capsule of any of the currently available plant source digestive enzyme formulas, as measured by FCC Methods. One capsule is equivalent to 2-20 capsules of other formulations.
- 2. COST EFFECTIVE AND CONVENIENT:** One capsule is often sufficient to aid digestion of an entire meal.
- 3. DUAL FUNCTION:** May be taken with food, or on an empty stomach for proteolytic activity.
- 4. SPECIALLY FORMULATED:** Designed by a world leader with decades of experience in enzyme formula production. Specifically formulated to provide the WIDEST range of useful digestive enzymes to help break down foods, absorb nutrients and prevent maldigestion, gas, and bloating. Optimum digestion involves breaking down more than just starch, protein, fiber, and fats. Some food groups need several types of enzymes to become fully digested and to allow all the nutrients to be available for assimilation. Five different types of Protease are included to assure digestion of proteins over the entire pH range from pH 2.0 to pH 11.0 as found in the stomach and small intestine. Other formulas may only include one or two types of Protease. Total-Gest contains other enzymes not often found together in one formula, such as phytase and hemicellulase, invertase, alpha-galactosidase, and peptidase. These each have specific roles for Total Digestion. Please see the explanation of each enzyme's function below.
- 5. BROAD ACTIVITY RANGE:** Designed to work effectively, taking into account the range of pH conditions found in different individuals' intestinal tracts due to age, health, ability to secrete acid, etc.
- 6. FAST ACTING:** One capsule will often relieve the bloated feeling of indigestion in minutes after it is swallowed.
- 7. STANDARDIZED POTENCY:** Activity of all enzymes is specified by the latest FCC standard analytical methods. Each capsule is standardized to contain the enzyme activities listed on the label.
- 8. PROPERLY PACKAGED & PROTECTED:** All bottles are sealed with an induction seal, and contain both a desiccant and an oxygen absorber to protect against moisture and oxidative degradation.
- 9. ALL VEGETARIAN FORMULA:** In vegetable capsules.

How to Understand Digestive Enzymes:

A Guide to Purchasing Quality and getting value for your money!

What Type of Enzymes are in Total-Gest?

Total-Gest contains only plant source digestive enzymes, as opposed to animal source Pancreatic Enzymes. Plant derived enzymes are specifically useful in digesting the many types of foods in a varied diet. These include fat, starch, protein, sugars, and fibers.

What is the Difference Between Plant and Animal source enzymes?

Animal source enzymes are derived from bovine (cow) or porcine (pork) Pancreatin, and function in a limited alkaline pH range, as found in the small intestine, but not in the stomach with its lower (acidic) pH. Plant source enzymes are able to operate efficiently in a range as wide as 2-11 pH, which allows them activity in the stomach as well as the small intestine. Thus, plant enzymes are the clear choice for digestive support.

Why take Digestive Enzymes?

As we age, our pancreas produces less and less digestive enzymes, from aging, stress, and heredity. It is estimated that 20 to 40% of all Americans suffer from non-ulcer dyspepsia. Most of these people lack sufficient digestive enzymes to properly digest an average meal. Many elderly people suffer from gas, bloating, and that uncomfortable "full" feeling after eating the same meals that, when younger, gave them no such problems. The discomfort of bad digestion leads many to eat insufficient amounts of food to avoid the discomfort. Diets high in processed and cooked foods deactivate natural digestive enzymes in food, stressing the pancreas which must produce large amounts of enzymes.

There are many health problems associated with incomplete digestion, including malnutrition from insufficient breakdown of the nutrients in food to a state where they can be properly absorbed into the blood and utilized by the body. In addition, the larger, incompletely broken down food particles may still enter the bloodstream in individuals from a common condition known as "leaky gut syndrome" in which the mucosa of the intestines has been damaged. Once in the blood, these large particles are attacked by the immune system as invaders, creating immune reactions leading to many health problems, from allergies to arthritic damage.

How can I know the true activity and potency of the enzymes in a formula?

There are many digestive enzyme products sold. Enzymes are living substances. A simple measurement of weight (milligrams) tells you NOTHING about the ACTIVITY or potency of that enzyme. When enzymes are produced, they are either extracted from an animal source (Pancreatin), or grown on grains by fermentation of certain plant organisms, mostly a form of aspergillus. The most common growth media are soy, rice, barley, and corn. The potency, or activity, of an enzyme, varies from batch to batch in production. Therefore, to standardize the activity, a "carrier" such as maltodextrin is added to the raw enzyme to standardize its potency. The final purification process removes the unnecessary proteins of the grains present in the growth medium.

The key to buying active enzymes is to understand the concept of ACTIVITY, and how it is MEASURED. Having a standard, repeatable, scientific method measuring any substance is essential to the quality and usefulness of the final product. With enzymes, this concept is most important, since an enzyme can easily be mixed with other substances during production, to manipulate its level of potency or activity.

At present there is one up-to-date widely recognized standard measurement of activity and digestion power for most of the plant source digestive enzymes used in dietary supplements - the FCC (Food Chemical Codes). FCC Measurement Protocols are the most reliable scientific way to measure the activity of an enzyme.



Why put up with that full, bloated feeling?

Enzymes in Total-Gest, with the source, measurement unit, pH range, and food types the enzyme digests.

Enzyme (by type)	aids digestion of	plant source	Units/capsule	pH range
Alpha-Galactosidase	raffinose sugars	Aspergillus niger	GalU	4.0 - 6.5
Amylase (alphaAmylase)	starch, glucose	Aspergillus oryzae	DU	4.0- 10.0
Bromelain	proteins, polypeptides	Ananas cosmosus	PU	4.0 - 9.0
Cellulase	cellulose (fibers)	Trichoderma longbrachiatum	CU	3.0 - 6.0
Glucoamylase	starch, glucose	Aspergillus niger	AGU	3.0 - 5.5
Hemicellulase	hemicellulose fiber	Aspergillus niger	HCU	3.0 - 6.0
Invertase (Sucrase)	sucrose (sugar)	Saccharomyces cerevisiae	INVU or IAU SU**	3.5 - 6.5
Lactase	lactose (milk sugar)	Aspergillus oryzae	ALU	3.5 - 6.5
Lipase	fats	Aspergillus niger	LU	3.0 - 9.0
Malt Diastase (Maltase)	starch, glucose	Hordeum vulgare	DP	4.0 - 9.0
Papain	proteins, polypeptides	Carica papaya	PU	3.0 - 10.5
Peptidase	proteins, polypeptides	Aspergillus oryzae	HUT	4.0 - 11.0
Phytase	phytic acid	Aspergillus niger	FTU	2.0 - 7.0
Protease 3.0 (acid stable)	proteins, polypeptides	Rhizopus niveus	SAPU	2.0 - 7.0
Protease 4.5	proteins, polypeptides	Aspergillus oryzae	HUT	2.0 - 9.5
Protease 6.0	proteins, polypeptides	Aspergillus oryzae	HUT	4.0 - 11.0
Neutral Protease	proteins, polypeptides	Bacillus subtilis	NU*	5.5 - 8.5

* NU is not an FCC Standard. The Neutral Protease used in this formula is calculated in HUT's and is part of the total of 58,000 FCC HUT of Protease activity.

** SU are Sumner Units, a reliable unit of measurement of this enzyme, not yet recognized by the FCC.

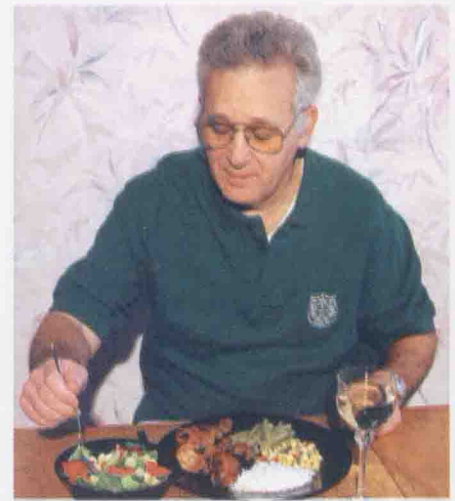
How do I know what type of activity units are meaningful for an enzyme?

Some products specify enzyme activity in USP units, NF units, or SKB units.

How do I compare these to FCC units?

USP units and NF units are sometimes used to measure activity of Pancreatic (animal) source enzymes, but should not be used for plant source enzymes. SKB units are an older measurement standard no longer used by most companies because the protocols for measurement are not as reliable as FCC.

For your convenience we are listing the conversion factors for FCC measurement units to any of the other RECOGNIZED measurement units:



Enjoy the foods you want to eat with Total-Gest!

Enzyme	FCC units	USP units	NF units	SKB units
Amylase	1 DU unit	48 units (*)	48 units (*)	1 unit
Glucoamylase	1 AGU unit	N/A	N/A	not currently used
Lipase	1 LU unit	6.3 units (*)	6.3 units (*)	N/A
Maltase	1 DP unit	N/A	N/A	not currently used
Protease	1 HUT unit	0.61 PC unit	6.5 units (*)	6.5 units (*) N/A

(N/A = no units exist for this enzyme)
 (*) Only to be used when measuring Pancreatic (animal) source enzymes.
 There are two different FCC units used for this enzyme:
 Invertase 1 FCC IAU (Method III) = 37 FCC INVU (Method IV)

For the specific enzymes used in Total-Gest, any product labels listing other unit types, such as SAU, BTU, or the name of the enzyme followed by "units", are not standard recognized methods of listing activity and thus cannot be compared to the above types of activity units. Some formulations contain very large "made up" activity units which do not reveal true activity. Also, listing the total amount of milligrams of an enzyme does not reveal its true activity. A proper listing of an enzyme activity unit should specifically use the proper FCC designation (such as DU, HUT, etc) and refer to the fact that the unit is an FCC unit.

Contents of one capsule of Total-Gest

Supplement Facts:

Serving size: 1 capsule
 Servings per container: 90

Activity per capsule	FCC Units	%DV
Amylase	12,000 DU	*
Protease	58,000 HUT	*
(Proprietary blend of Protease 3.0, 4.5, 6.0, Neutral Bacterial, & Peptidase)		
Lipase	1,000 LU	*
Cellulase	1,500 CU	*
Glucoamylase	20 AGU	*
Invertase (Sucrase)	40 INVU	*
	100 SU (1)	*
Bromelain	500,000 PU	*
Papain	500,000 PU	*
alpha-Galactosidase	120 GALU	*
Peptidase FP	2,000 HUT	*
Malt Diastase (Maltase)	200 DP	*
Lactase	600 ALU	*
Phytase	4.5 FTU	*
Hemicellulase	260 HCU	*

* No Daily Value established.
 Excipients: Maltodextrin, calcium di-phosphate, rice flour, silica.
 No ANIMAL PRODUCTS. Vegetarian capsules.
 (1) SU= Sumner Units (non-FCC unit type)

*This is a brief list of reasons for the choice of enzymes in Total-Gest.
The enzymes are grouped by the food types they digest.*

Carbohydrolytic (starch, carbohydrates):

Amylase hydrolyzes the interior alpha-1,4-glucosidic bonds of starch, reduces the viscosity of gelatinous starch, amylose, and amylopectin solutions to yield soluble dextrans. Its saccharifying action liberates glucose and maltose.

Malt Diastase (Maltase) continues the breakdown of starch by removing successive maltose units from the non-reducing ends of polysaccharides.

Glucoamylase completes the hydrolysis of starches by turning maltose into glucose. Glucoamylase hydrolyzes terminal (end) linkages while Amylase works on the interior bonds.

Sugars:

Lactase digests milk sugars into glucose and galactose. This action is especially important in individuals who consume milk products and have a lactase deficiency (known as lactose intolerance). This group includes 70% of the world's population and over 1/3 of the US population.

Invertase (Sucrase) breaks down sucrose (refined table sugar) into glucose and fructose. It is theorized that undiagnosed sucrose intolerance contributes to many allergies.

Alpha-Galactosidase is included to hydrolyze certain types of sugars called oligosaccharides found in certain vegetables, legumes, and grains. These sugars, including raffinose, stachyose, and verbascone, are indigestible because humans do not produce alpha-Galactosidase to break them down. Undigested, these sugars remain in the intestine and are fermented by certain bacteria, causing gas and bloating.

Fibers:

Cellulase is a complex of 3 enzymes which convert the cellulose in plant fibers to glucose.

Hemicellulase will hydrolyze hemicellulose, a polysaccharide which binds certain enzymes and decreases the rate of nutrient digestion. Hemicellulase will reduce the molecular weight of these components, such as galactomannoglucans, beta glucans, pentosans, and various gums, turning them into polysaccharides which are more easily assimilable.

Phytase digests phytate, a major component of wheat bran that binds minerals such as zinc iron and calcium, hindering their absorption. Phytase catalyzes the hydrolysis of phytate (phytic acid) into its component parts, releasing beneficial inositol and ortho-phosphate.

Proteins (Proteolytic):

Protease is an enzyme which digests proteins. By combining 5 different Proteases, Total-Gest allows digestion of protein at a full range of pH conditions as exist in the entire digestive tract, from the stomach to the small intestine. Optimal protein digestion begins in the stomach, with its lower pH. To create the wide range of activity, proteases are used which have optimal activity at pH's of 3.0, 4.5, 6.0, but which work across the entire range of 2.0 to 11.0. In addition, neutral bacterial protease is added to hydrolyze most soluble proteins.

Peptidase FP is added to selectively hydrolyze protein molecules at the ends of a peptide chain, and liberate amino acids.

Bromelain is a mixture of enzymes from ripe and unripe Pineapple fruit and plant stem, which has a range of activity, breaking down proteins to form peptides and amino acids with preferential cleavage of peptide bonds where the carbonyl group is from either a basic amino acid or an aromatic amino acid. Bromelain is also effective as an anti-inflammatory agent.

Papain is derived from the Papaya plant (the latex of the unripe fruit), and has been used as an aid to digestion since the 1880's, to relieve dyspepsia and other common digestive disorders. Clinically, it has been shown to prevent peritoneal adhesions common after surgery.

Fats (Lipolytic):

Total-Gest contains a large amount of Lipase, the enzyme that specifically digests fats (triglycerides) into free fatty acids and glycerol, enabling absorption of fat soluble nutrients through the intestinal mucosa. Improper fat digestion is a very common ailment in populations such as the U.S. where large amounts of fats and oils are consumed. Significant discomfort such as bloating, gas, and a "full" feeling are common in middle aged and elderly people who lack sufficient lipolytic enzymes. The dose of 1000 LU of Lipase is specifically designed to digest meals containing large amounts of fat.

Available from:

Klabin Marketing – Longevity Science

1-800-933-9440

or 212-877-3632

