

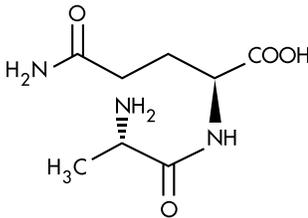
DEFINITION

Sustamine® is a dipeptide consisting of two amino acids (L-alanine and L-glutamine) connected by a peptide bond. Sustamine is stable to both heat and acids, is highly soluble, and can function as a source of glutamine in the body.^{1,2} Because of these properties, Sustamine is used in clinical nutrition as a source of glutamine without the problems of poor stability in liquids and low solubility that are associated with free-glutamine.³ Because Sustamine's dipeptide form breaks down into free alanine and glutamine immediately upon entering the body, the benefits of Sustamine include glutamine's ability to promote protein synthesis and stimulate immune action as well as L-alanine's ability to supply energy and promote healthy hydration.

Chemistry

Molecular formula: $C_8H_{15}N_3O_4$

Structural formula

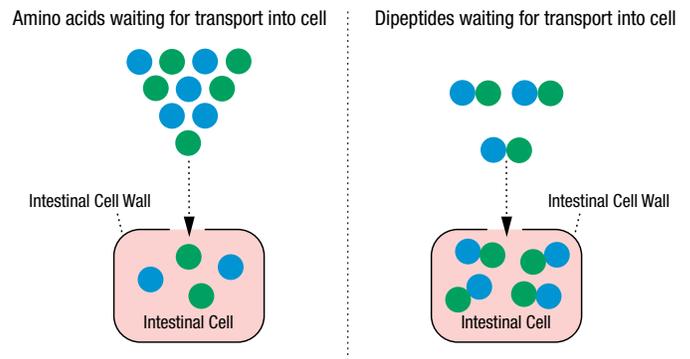


ABSORPTION

Why dipeptides?

Sustamine is the result of a patented fermentation process that creates a true dipeptide for the efficient absorption of L-glutamine and L-alanine in the body.* A true dipeptide is a bonded chain of two amino acids. Smaller than a complete protein, the dipeptide Sustamine is absorbed faster than individual amino acids. To get into cells dipeptides an amino acid must wait for a "transporter." A transporter can carry either a single amino acid or a dipeptide through the cell barrier at once. Through coupling for transport, dipeptides drastically reduce the time and energy needed for cellular recovery.

- Dipeptides are absorbed more efficiently than protein
- Dipeptides do not require additional energy to break down bulky protein molecules
- Dipeptides increase amino acid transport into cells for faster recovery
- Dipeptides supply two amino acids for the energy costs of one
- Dipeptides can increase the stability and solubility of the bonded amino acids

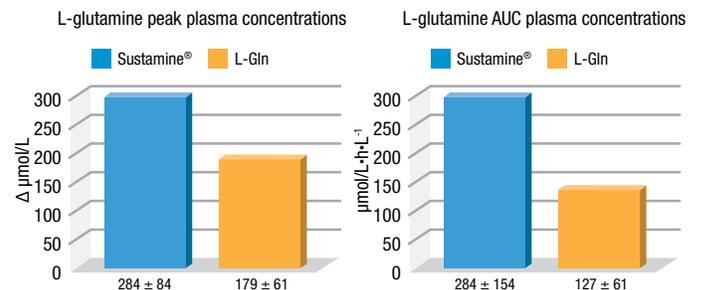


Dipeptides drastically reduce the time and energy needed to transport amino acids through cell barriers.

Dipeptide absorption research

A crossover study utilizing a placebo control measured plasma L-glutamine concentrations. The study compared L-glutamine absorption levels between water (the control), Sustamine and straight L-glutamine (L-Gln) and measured both mean peak increase and mean area under the curve (AUC) levels.¹²

- Sustamine showed statistically significant increases in L-glutamine peak plasma absorption levels
- Sustamine maintained L-glutamine levels in the plasma longer (up to 4 hours) than L-Gln (up to 2 hours)
- Mean AUC measurements revealed statistically higher plasma L-glutamine levels for Sustamine than L-Gln



*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.



KYOWA HAKKO U.S.A., INC.

Customer Service: 800.596.9252

info@kyowa-usa.com

600 Third Ave. 19th Floor
New York, NY 10016

Tel: 212.319.5353
Fax: 212.421.1283

www.kyowa-usa.com
www.sustamine.com

Sustamine® is safe and pure and taste-free

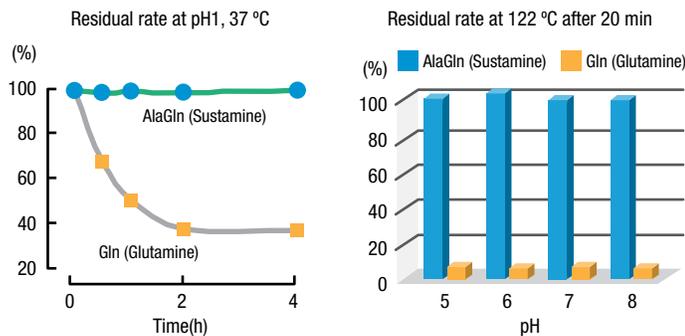
Safe. Sustamine has been proven safe in numerous clinical studies.^{1,2,3} No substantial adverse effects associated with the administration of Sustamine have been identified with any human or animal study. Furthermore, it has been confirmed that Sustamine breaks down into its free amino acid components and is utilized in the body after it has been metabolized.^{1,2} Sustamine is the only dipeptide backed by oral human clinical results, and the only self-affirmed GRAS dipeptide of L-Alanyl-L-Glutamine for foods and beverages.

Pure. Produced through a patented fermentation process, Sustamine is vegetarian, allergen-free, Kosher and contains no additives or preservatives.

Taste-free. Most peptides have a strong bitter taste. Sustamine is almost tasteless when dissolved in liquids.

Sustamine is stable

Stable. Glutamine begins to degrade when mixed with liquids, but Sustamine's unique dipeptide form resists degradation and ensures that patients actually receive the amount listed on the label. Sustamine is also stable in combination with other actives, such as vitamins or electrolytes.

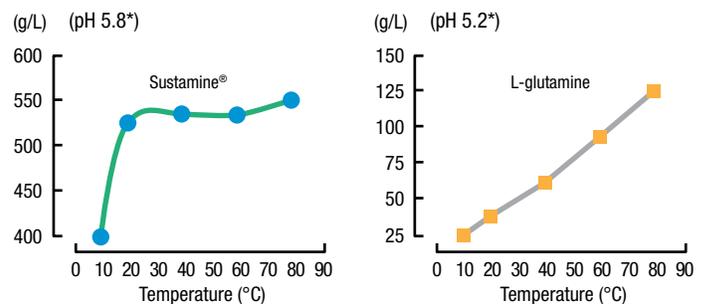


Sustamine is stable in liquids and also at high temperature

Sustamine is soluble

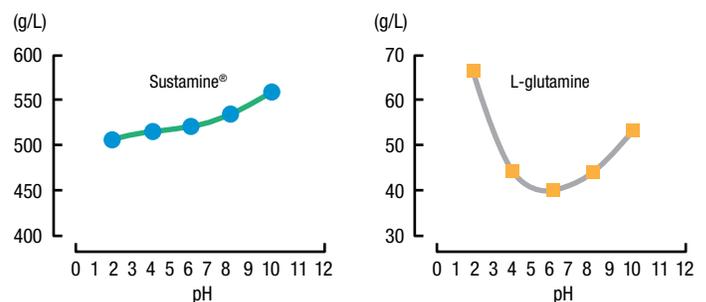
For patients who have a difficult time swallowing pills, Sustamine offers the added benefit of dissolving completely in hot or cold liquids—so there is no gritty texture.

Temperature-dependent solubility



*pH when material is dissolved in water

pH-dependent solubility (20°C)



References

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