

Through repeated efforts that threaten destruction, one forges the indestructible.

Essential Aminos

Putting on muscle is a balancing act, pivoting on your ability to adapt to training stress and recover from everything else that life throws at you. A poor diet, pushing your training too hard for too long and factors beyond your control (like a nasty flu virus) can all slam the brakes on your “gains train.” If you want to push towards your recovery limits, you’re going to need an “ace in the hole.”

- Granite Supplements’ Essential Aminos provide a 7g / dose of all the **Essential Amino Acids (EAAs)** because it’s the dietarily **essential** [not the non-essential¹] **amino acids** that trigger muscle protein synthesis²⁻⁴. Leucine (3g) sits atop this EAA blend because of it’s primacy in triggering protein anabolism⁵⁻⁷. We were sure to focus on the other branched chain aminos (BCAAs; Isoleucine and Valine at 1.5g each) as well, because the BCAAs are known to reduce muscle breakdown and post-exercise soreness and damage^{8,9}.
- The amounts of the other EAAs blended in **Essential Aminos** are based on the anabolic EAA mixture used extensively in research^{2,10-13}, adjusted slightly to take advantage of the anabolic signaling⁶ and insulin-releasing¹⁴ effects of lysine and phenylalanine.
- This power-packed EAA supplement can thus be employed in conjunction with a small amount of carbohydrate (~35g; which could come from our **Intra-Carb** product) to **enhance post-workout protein synthesis**^{11,15} and **gains in muscle mass**¹⁶. If you’re stuck between a rock and a hard place with little to no good protein sources, EAA’s can **boost the protein-synthetic effect of an otherwise suboptimal protein source**, e.g., one that is too small⁷ or otherwise dilute in protein content or lacking in EAAs, such as some plant protein sources¹⁷. You might also use EAA to “bridge” the gap between two widely spaced meals, when you simply can’t slip away to consume a complete protein source or have a meal.

References

1. Tipton KD, Gurkin BE, Matin S, Wolfe RR. Nonessential amino acids are not necessary to stimulate net muscle protein synthesis in healthy volunteers. *J Nutr Biochem*. 1999;10(2):89-95.
2. Borsheim E, Tipton KD, Wolf SE, Wolfe RR. Essential amino acids and muscle protein recovery from resistance exercise. *American journal of physiology. Endocrinology and metabolism*. 2002;283(4):E648-657.
3. Volpi E, Kobayashi H, Sheffield-Moore M, Mittendorfer B, Wolfe RR. Essential amino acids are primarily responsible for the amino acid stimulation of muscle protein anabolism in healthy elderly adults. *Am J Clin Nutr*. 2003;78.

4. Smith K, Reynolds N, Downie S, Patel A, Rennie MJ. Effects of flooding amino acids on incorporation of labeled amino acids into human muscle protein. *Am J Physiol*. 1998;275(1 Pt 1):E73-78.
5. Eriksson S, Hagenfeldt L, Wahren J. A comparison of the effects of intravenous infusion of individual branched-chain amino acids on blood amino acid levels in man. *Clin Sci (Lond)*. 1981;60(1):95-100.
6. Atherton PJ, Smith K, Etheridge T, Rankin D, Rennie MJ. Distinct anabolic signalling responses to amino acids in C2C12 skeletal muscle cells. *Amino acids*. 2010;38(5):1533-1539.
7. Churchward-Venne TA, Burd NA, Mitchell CJ, et al. Supplementation of a suboptimal protein dose with leucine or essential amino acids: effects on myofibrillar protein synthesis at rest and following resistance exercise in men. *The Journal of physiology*. 2012;590(Pt 11):2751-2765.
8. Shimomura Y, Inaguma A, Watanabe S, et al. Branched-chain amino acid supplementation before squat exercise and delayed-onset muscle soreness. *International journal of sport nutrition and exercise metabolism*. 2010;20(3):236-244.
9. Coombes JS, McNaughton LR. Effects of branched-chain amino acid supplementation on serum creatine kinase and lactate dehydrogenase after prolonged exercise. *The Journal of sports medicine and physical fitness*. 2000;40(3):240-246.
10. Tipton KD, Borsheim E, Wolf SE, Sanford AP, Wolfe RR. Acute response of net muscle protein balance reflects 24-h balance after exercise and amino acid ingestion. *Am J Physiol Endocrinol Metab*. 2003;284(1):E76-89.
11. Tipton KD, Rasmussen BB, Miller SL, et al. Timing of amino acid-carbohydrate ingestion alters anabolic response of muscle to resistance exercise. *Am J Physiol Endocrinol Metab*. 2001;281(2):E197-206.
12. Rasmussen BB, Wolfe RR, Volpi E. Oral and intravenously administered amino acids produce similar effects on muscle protein synthesis in the elderly. *J Nutr Health Aging*. 2002;6(6):358-362.
13. Rasmussen BB, Tipton KD, Miller SL, Wolf SE, Wolfe RR. An oral essential amino acid-carbohydrate supplement enhances muscle protein anabolism after resistance exercise. *Journal of applied physiology*. 2000;88(2):386-392.
14. Floyd JC, Jr., Fajans SS, Conn JW, Knopf RF, Rull J. Stimulation of insulin secretion by amino acids. *J Clin Invest*. 1966;45(9):1487-1502.
15. Rasmussen BB, Tipton KD, Miller SL, Wolf SE, Wolfe RR. An oral essential amino acid-carbohydrate supplement enhances muscle protein anabolism after resistance exercise. *J Appl Physiol*. 2000;88(2):386 - 392.
16. Bird SP, Tarpennin KM, Marino FE. Independent and combined effects of liquid carbohydrate/essential amino acid ingestion on hormonal and muscular adaptations following resistance training in untrained men. *Eur J Appl Physiol*. 2006;97(2):225-238.
17. Young VR, Pellett PL. Plant proteins in relation to human protein and amino acid nutrition. *The American journal of clinical nutrition*. 1994;59(5 Suppl):1203S-1212S.