

BCAAs



empirica

Clinical Applications

- Supports Muscle Protein Synthesis in the Young and the Elderly*
- Supports Muscle Recovery After Exercise*
- Supports Muscle Strength and Function*

*BCAAs represents a breakthrough in the use of amino acids for muscle protein synthesis. Over 20 human trials have been conducted to arrive at this specific, patent-pending combination of amino acids in the most effective, anabolic ratios. Whether you want to support muscle strength and function or prevent muscle loss associated with inactivity or aging, BCAAs provides the right amino acids in the right ratios to help you meet your goals and stay healthy.**

All EmFit Formulas Meet or Exceed cGMP Quality Standards

Discussion

The amino acid (AA) formula that comprises BCAAs was meticulously developed and studied by internationally recognized researchers in the fields of muscle metabolism and aging and longevity. Seventeen years of research have resulted in this particular blend of the nine essential amino acids (EAAs)— including the branched-chain amino acids leucine, isoleucine, and valine—plus arginine, proportioned in the most optimal ratios for muscle anabolism.^[1-22] BCAAs is designed for both young and elderly individuals who are seeking to stimulate muscle protein synthesis, hasten muscle recovery, and promote muscle strength and function.*

Quality Not Quantity Amino acids are potent stimulators of muscle protein synthesis in both the young and the elderly. Of the AAs, data indicate that EAAs are primarily responsible for this biological process.^[9] Moreover, studies demonstrate that there is no additional benefit to muscle protein synthesis from adding nonessential AAs to an EAA supplement.^[21] For instance, the addition of 22 g of non-essential AAs to 18 g of EAAs produced no additional benefit to net muscle balance when compared to the provision of 18 g of EAAs alone.^[21] Likewise, a 15 g EAA supplement—with the nine EAAs in similar ratios to BCAAs—had twice the impact on muscle protein synthesis than that of an equal amount (15 g) of a high-quality protein.*^[14]

Why Include Arginine? In healthy young adults, sufficient arginine can be synthesized to meet normal demands. However, during rapid growth or in response to stress, there are heightened needs for arginine that may not be fully met. Furthermore, there is evidence that arginine has a unique stimulatory effect on muscle protein synthesis. While all mechanisms have not been fully elucidated and are likely multifactorial, it is known that arginine converts to nitric oxide, which relaxes blood vessels and improves blood flow to muscles. Last, arginine availability influences its own catabolism and that of other amino acids by controlling ureagenesis. A critical finding that solidified the need to add arginine to the EAA formulation was that without it, plasma arginine decreases; therefore, the rate of protein synthesis is potentially reduced.*^[17]

Essential Amino Acids and Exercise The effectiveness of EAA intake is amplified by ingestion before exercise because of the increased delivery of amino acids to the muscles.^[6,21] In fact, results from acute studies have shown that exercise and EAA intake have additive effects on muscle protein synthesis.^[17] Furthermore, branched-chain AAs (BCAAs), have been demonstrated to hasten post-exercise muscle recovery. Data show that BCAA (e.g., leucine) supplementation before and after exercise helps decrease exercise-induced muscle damage, promotes muscle protein synthesis, and modulates exercise-related cytokine production.^[23,24] For example, leucine-enriched EAA supplementation (total EAA was 10 g of which 1.85 g were leucine) prolonged the anabolic response and the sensitivity of skeletal muscle to AAs.^[25] Børsheim et al propose that over time, exercise will increase the beneficial effects of EAA supplementation on lean body mass and strength and improve functional parameters of muscles.*^[17]

Muscle Loss with Aging Beginning in the fourth decade of life, there is a natural and gradual decline in muscle mass (catabolism), strength, and function as a result of the innate metabolic changes and the more sedentary lifestyle that accompany aging. Studies using EAA supplementation at doses of 6.7 to 45 g/d in advanced age, bed rest, and recovery from surgery have demonstrated important benefits. These benefits include stimulation of muscle protein synthesis, enhancements in muscle strength, and improvements in functional parameters of the studied muscle(s).^[11,14,15,17,20,22]

In the Elderly Protein supplements are often used to help ward off muscle-related losses in the elderly. According to Ferrando et al, "Increasing protein intake to 1.4 g/kg/d in the elderly with EAA supplementation indicates the potential for preserving muscle function."^[20] Because non-essential AAs are not as effective as EAAs for muscle anabolism, supplements containing significant calories in the form of non-essential AAs may be inadequate to maximize anabolic efficiency in the elderly.^[9] Furthermore, the elderly tend to use protein supplements as calorie substitutes and reduce their food intake.^[9,20] In these cases, it becomes critical that the AA supplement be low-calorie, so as not to influence satiety, and highly efficient to confer maximum benefits to skeletal muscle.^[20] A high proportion of leucine is another factor that is required for optimal stimulation of muscle protein synthesis in the elderly.^[15] Additionally, there is evidence that the presence of carbohydrates in a nutritional supplement for the elderly is not beneficial and may actually impair muscle anabolism.^[9,17] BCAAs is a highly efficient blend of EAAs plus arginine that provides zero carbohydrates.*

***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.**

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3198 Blake Street
Suite 222
Denver, CO 80205

BCAAs



Supplement Facts

Serving Size: 1 Scoop (about 6.8 g)

Servings Per Container: About 30

	Amount Per Serving	%Daily Value
Calories	5	
Sodium	60 mg	3%
L-Leucine	1.639 g	**
L-Lysine HCL	707.85 mg	**
L-Valine	450 mg	**
L-Isoleucine	436.5 mg	**
L-Arginine	405 mg	**
L-Threonine	382.5 mg	**
L-Phenylalanine	274.5 mg	**
L-Methionine	135 mg	**
L-Histidine	67.5 mg	**
L-Tryptophan	2.7 mg	**

** Daily Value not established.

Other Ingredients: Citric acid, malic acid, natural flavors (no MSG), sea salt, stevia, and riboflavin (for color).

Directions

Dissolve one scoop (6.8 g) into 8-12 oz of room-temperature water and consume once per day between meals, or use as directed by your healthcare practitioner.

Consult your healthcare practitioner prior to use. Individuals taking medication should discuss potential interactions with their healthcare practitioner. Do not use if tamper seal is damaged.

Does Not Contain

Wheat, gluten, yeast, soy, animal or dairy products, fish, shellfish, peanuts, tree nuts, ingredients derived from genetically modified organisms (GMOs), artificial colors, artificial sweeteners, or artificial preservatives.

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Additional references available upon request

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Suite 222
Denver, CO 80205

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