

# BCAA

## Branched Chain

## Amino Acids



### Ingredients

Doctor's Best Branched Chain Amino Acids (BCAAs) refers to the essential amino acids: Leucine, Isoleucine and Valine. These amino acids are considered essential because they cannot be synthesized by the body, therefore they must be obtained through dietary intake. BCAAs can be found in many protein sources, such as milk, meat and eggs, but these sources may not provide an optimal amount of these essential amino acids. BCAAs have been shown to be vital for muscle protein synthesis. BCAAs act as constitute proteins for the building of muscles, but more importantly, their presence activates signaling pathways for muscle growth<sup>1, 2, 3</sup>. Supplementation of BCAAs prevents fatigue during exercise by attenuating the decline of circulating levels of BCAAs, a process which can result in fatigue. BCAA supplementation has been shown to improve athletic performance during both strength and endurance exercises, as well as increase preferential loss of body fat<sup>4, 5, 6, 7</sup>.

### Benefits

**Stimulates Muscle Growth\***

**Prevents Muscle Breakdown\***

**Helps Prevent Exercise-Induced Fatigue\***

**Increases Preferential Loss of Body Fat\***

The primary mechanism through which BCAAs stimulate muscle growth is by activating the protein mTOR, mammalian Target of Rapamycin. The mTOR signaling pathway is responsible for cellular growth, and most importantly, muscle protein synthesis. Muscle protein synthesis stimulated by the mTOR protein enhances muscle repair and hypertrophy<sup>1</sup>. This muscle protein synthesis is stimulated by the presence of Leucine, independent of the presence of any other amino acids. This was shown in a study in which researchers fed 25 healthy males a complete balanced diet, inducing hyperaminoacidaemia, an excess of amino acids in the blood stream. Only half of the subjects were supplemented with Leucine in addition to their diets; muscle fractional synthesis rates were shown to be significantly higher in the group that received the additional Leucine. This demonstrated that supplementation of one of the Branch Chained Amino Acids, Leucine, improves muscle protein synthesis independent of the presence of other amino acids<sup>8</sup>.

Another major mechanism by which BCAAs can increase muscle mass is by attenuating muscle breakdown as a result of exercise. Muscle proteolysis, or breakdown, has been shown to be suppressed simply with BCAA supplementation, independent of any action by insulin<sup>9, 10, 11, 12</sup>. Serum BCAA levels can be depleted and BCAA catabolism can be increased as a result of intense exercise<sup>13, 14</sup>. The best way to combat the muscle breakdown, muscle fatigue, depletion of serum BCAAs and the delayed on-set muscle soreness from intense exercise is to supplement with BCAAs<sup>15, 16, 17, 18</sup>.

BCAA supplementation has been shown to improve sports performance; these improvements in sports performance have been demonstrated with a variety of mechanisms over many studies measuring sports related variables. In 2007, researchers conducted a study in college males to see how BCAA supplementation affected markers of muscle damage, perceived exertion and leg strength following exercise, compared to either carbohydrate or placebo supplementation. Following the exercise, the group that received BCAA supplementation showed lower levels in both of the measured markers of muscle damage, a lower rate of perceived exertion and better performance on the strength test compared to the groups that received either placebo or carbohydrate supplementation<sup>19</sup>.

In a study that examined two groups performing squat exercises over three days and received either carbohydrates or BCAAs, at a dosage of 5.5 grams. The group that received the BCAA supplementation maintained their performance throughout the study better and had less muscle soreness than the group that received the carbohydrate supplementation<sup>20</sup>. In a study comparing elite competitive wrestlers on a hypo caloric diet, the group that received BCAAs, were able to maintain their high level of performance while inducing significant loss of visceral adipose tissue, body fat, as compared to groups receiving either high or low amounts of protein and the control group<sup>21</sup>.

### Supplement Facts

Serving Size 1 scoop (5 grams)  
Servings Per Container 60

	Amount Per Serving	% Daily Value
Calories	20	
BCAA Blend	5 g	†
L-Leucine	2.5 g	†
L-Isoleucine	1.25 g	†
L-Valine	1.25 g	†

† Daily Value not established.

**Other Ingredients:** Sunflower lecithin.

**Suggested Adult Use:** Add 1 scoop of powder to 8 oz. of juice or protein shake and mix well. For best results, drink 1 hour before exercise. Repeat after exercise, before bedtime, or as recommended by a nutritionally-informed physician.

**WARNING:** Consult your physician prior to use if you are taking corticosteroids or any medication for diabetes or thyroid. Avoid using if you are pregnant, lactating, 2 weeks prior and after surgery. Keep out of reach of children.

**Non-GMO / Gluten Free / Soy Free / Vegan**

Store in a cool dry place.

NOTE: Settling of contents may occur, which may cause slight variations in number of servings.

\* 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.

Endurance performance was significantly improved in runners that received BCAA supplementation when trained participants competed in a 30-km cross-country race or a marathon. The runners that received BCAAs had more significant improvements in run times and less mental fatigue after the races compared to the placebo groups<sup>22</sup>. Drinking BCAAs has been shown to enhance exercise capacity and increase lipid oxidation in individuals that have depleted muscle glycogen stores as a result of exhaustive exercise<sup>23</sup>.

Branch Chained Amino Acids are an essential part of a healthy diet. BCAA supplementation, in combination with exercise, has been shown to improve sports performance through a variety of mechanisms. BCAAs has also been shown to help in improving body composition. The recommended dosage for Doctor's Best Branch Chained Amino Acids is 5 grams daily.

## Scientific References



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