

## **Build a Better Body with BCAA's(Branched Chain Amino Acids)**

BCAA's play an equally important role in maximizing muscle gains.

**Whether your goal is to build muscle, improve performance, or even lose fat, the BCAA's (leucine, isoleucine, and valine) will rock your body—*inside and out!***

*By Marie Spano, MS, RD, CSCS*

Let's get straight to the point: If your workout goals include getting a model-like physique, boosting muscle gains, or recovering rapidly, you should include Branched Chain Amino Acids (BCAA's) in your supplement arsenal. The BCAA's, composed of leucine, isoleucine, and valine, will rock your body inside and out. Here's why:

### **Muscle Gains**

Whey, casein, and even soy are typically tossed around as the protein powders of choice for people who want to pack on muscle. And, there's evidence they all work. However, BCAA's play an equally important role in maximizing muscle gains.

BCAA's work primarily by preventing muscle breakdown in the recovery period after exercise<sup>1,2</sup>. After a bout of resistance training, muscle protein synthesis increases, but muscle protein breakdown increases as well to the point where breakdown exceeds synthesis if you aren't getting the nutrients you need.

You can munch on some carbohydrate-rich pretzels or a banana after working out to tip this scale slightly. But you'll still be in a state of greater muscle breakdown.

BCAA's, fortunately, work on the right side of this equation by limiting muscle protein breakdown.

In addition to decreasing muscle breakdown, BCAA's, especially leucine, may also work on the right side of this equation by increasing muscle protein growth<sup>3</sup>.

Minimizing muscle damage is vital not only for making gains but also because it can help with recovery. And when you recover quickly, you can get back in the gym again and train hard—sooner, rather than later.

### **Less Soreness, Less Pain**

Several studies, using different doses of BCAA's, show just how important they are for decreasing muscle damage. In one study, athletes who rode a bike for two hours at a pretty good clip were supplemented with placebo or 12 grams of BCAA's per day. The researchers discovered that when supplementing with the BCAA's, peak levels of enzymes that tell us

there's been some muscle damage were delayed from two hours to five days for one marker, lactate dehydrogenase (LDH), and from four hours to five days post-test for creatine kinase (CK), indicating BCAA supplementation may reduce muscle damage associated with endurance exercise<sup>4</sup>.

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In another study using a different form of endurance exercise, 16 people participated in a 21-day trek at high altitudes and were supplemented with either placebo or 11.5 g BCAA in a double-blind, placebo-fashion. Both groups lost fat mass (11.7% and 10.3% in BCAA and placebo respectively) and the BCAA group gained a slight amount of lean body mass (1.5%). In addition, lower limb maximal power, as measured after the trek, decreased less in the BCAA vs. placebo (2.4% vs. 7.8%). In addition, the placebo group experienced a 6.8% decrease in arm muscle cross-sectional area whereas the BCAA group experienced no change. These results suggest that BCAA's not only have an anti-catabolic effect but also help protect against losses of muscular power as a result of exhaustive exercise at high altitudes<sup>5</sup>.

Additional research lends even more support to the power of BCAA's and minimizing muscle tissue damage. A dose of 2.6 grams of BCAA's given to middle distance runners decreased markers of muscle damage after long distance runs<sup>6</sup>, 5 grams of BCAA's given to women prior to resistance training decreased delayed onset muscle soreness and muscular fatigue in comparison to placebo<sup>7</sup>.

### **Leucine & BCAA's and Body Composition**

There's one more great benefit to BCAA's that stands out from the research: *they may help you lose some fat.*

BCAA's or leucine alone may help regulate bodyweight, especially while dieting<sup>8,9</sup>. BCAA's may help regulate satiety, leptin (a hormone in fat tissue that signals the brain that the body is full/satiated), glucose, adiposity, and body weight<sup>10</sup>.

In a study examining BCAA supplementation during caloric restriction in elite wrestlers, 25 subjects were given a hypocaloric control diet, hypocaloric high-protein diet, hypocaloric low-protein diet, or hypocaloric high BCAA diet for 19 days.

The BCAA group lost a significant amount of bodyweight (-4 kg,  $p < 0.05$ ) and body fat (-17.3%,  $p < 0.05$ ) in comparison to other groups. In addition, the BCAA group experienced a significant reduction in abdominal visceral adipose tissue (i.e., belly fat). There were no between-group differences in anaerobic capacity, VO<sub>2</sub>max, or muscular strength<sup>11</sup>.

Even if you don't want to lose weight, BCAA's may help athletes who have a hard time getting in enough calories and therefore unintentionally dropping weight<sup>12</sup>.

## Proper Dosages

How much do you need to decrease muscle damage during endurance exercise<sup>13, 14</sup> and minimize the loss of lean body mass and power experienced during prolonged exhaustive exercise<sup>15</sup>? Aim for 3 to 12 grams mixed in a sports drink one hour before exercise and sip on additional BCAA's in a sports drink throughout exercise lasting longer than one hour. Smaller female athletes can use less—approximately 3 to 5 grams of BCAA's, whereas larger athletes may need more (200-lb athletes, for instance, should aim for 7 to 10 grams). Only those participating in very long bouts of endurance exercise (bike rides lasting several hours, long treks uphill etc.) may need higher doses of up to 12 grams of BCAA's.

## In Summary

The research on BCAA's is growing by leaps and bounds. Right now the most convincing research tells us that BCAA's may decrease the amount of muscle damage and soreness associated with intense exercise<sup>16, 17, 18, 19</sup> helping athletes get back in the gym ASAP. In addition to helping mitigate muscle damage, leucine plays a role in the regulation of muscle protein synthesis—i.e., gaining muscle tissue<sup>20</sup> and leucine may be one of the key amino acids that can turn up the fat-burning switch in our body.

BCAA's and Amino Acids in general may not be the "sexiest" or most popular supplement on the market. But when it comes to helping you gain muscle, increase performance, and even lose fat, they provide a big bang for a relatively small buck.

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