



## Beta-hydroxy-beta-methylbutyrate (HMB)



### Alternative names

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Hydroxymethyl butyrate (HMB), 3-hydroxy-3-methyl-butanoic acid, 3-hydroxyisobutyric acid, {beta}-hydroxy-{beta}-methylbutyrate, beta-hydroxy-beta-methylbutyric acid, beta-hydroxy-beta-methylglutarate-CoA, b-hydroxy-b-methylbutyrate monohydrate

### Background

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HMB is a natural metabolite of the amino acid, leucine. HMB is also found in small quantities in foods such as grapefruit, alfalfa, and catfish. The human body also has the ability to synthesize HMB in the muscle and liver, where it is then converted to HMG-CoA, a precursor of cholesterol that is essential for the creation or repair of cell membranes. Since HMB is reported to be involved in muscle protein synthesis, many athletes and bodybuilders take HMB as a dietary supplement to enhance performance and training.

### Benefits of supplementation

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In the International Society of Sports Nutrition's position statement on HMB, the authors conclude that the literature supports the use of HMB for:

- Enhancing recovery from exercise by attenuating exercise induced skeletal muscle damage in both the trained and untrained population
- Enhancing skeletal muscle hypertrophy, strength, and power when taken at a dose of 38 mg/kg body weight
- Increasing lean body mass and functionality in elderly, sedentary populations
- Inhibiting muscle protein breakdown
- Increasing protein synthesis

Additional studies have shown that supplementation with HMB can possibly:

- Improve exercise performance by increasing the onset of blood lactate accumulation, meaning athletes can perform at a higher intensity before fatigue sets in
- Prevent cachexia in patients with AIDS, cancer, and rheumatoid arthritis, especially when taken in conjunction with L-glutamine and L-arginine
- Have immunomodulating effects by increasing concentration of basophils, lymphocytes, and eosinophils
- Enhance collagen synthesis, when taken in combination with arginine and glutamine
- Reduce cardiovascular disease risk factors by lowering total cholesterol, LDL cholesterol, and reducing systolic blood pressure

## Recommended Dosage

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| Population                                | Recommended Oral Dose  |
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| Adults, aged 18 years and older           | 3 grams or less QD for up to eight weeks   |
| Adults at risk for cardiovascular disease | 3 grams QD for up to eight weeks   |
| Children (age <18)                        | Insufficient evidence available  |
| Cachexia                                  | 3 grams HMB + 14 grams arginine + 14 grams glutamine QD for up to 24 weeks <ul style="list-style-type: none"><li>• Patients can divide this regimen up into two doses to take throughout the day</li></ul> |
| Athletes - exercise performance           | 3 grams QD for up to 9 weeks   |
| Athletes - exercise recovery              | 3 grams QD for up to 6 weeks   |

## Safety and Drug-Nutrient Interactions

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- Studies have shown that short-term supplementation with HMB is safe, but more studies are needed to examine the long-term effects of HMB supplementation
- HMB is not currently included on the FDA's Generally Recognized as Safe (GRAS) list
- There is currently no data on the use of HMB during pregnancy or lactation
- People who are taking the following medications are advised to avoid HMB supplementation:
  - Agents that affect the immune system
  - Antivirals
  - Blood pressure-lowering medications
  - Cholesterol-lowering agents
  - Weight loss agents

## References:

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"Beta-hydroxy Beta-methylbutyrate (HMB)." *SixPackFactory*. 20 Feb. 2013. Web. 07 Aug. 2013.  
<<http://www.sixpackfactory.com/beta-hydroxy-beta-methylbutyrate-hmb/>>.

"Body Building Supplements for Men." *Muscle Chronicle*. Web. 7 Aug. 2013.  
<<http://www.musclechronicle.com/body-building-supplements-for-men/>>.

Conquer, Julie, Dawn Costa, Marielle Galera, and Elizabeth R.B. Higdon. "Hydroxymethyl Butyrate (HMB)." *Natural Standard*. 2013. Web. 06 Aug. 2013.  
<<http://www.naturalstandard.com/databases/herbssupplements/hydroxymethylbutyrate.asp>>.

"Hydroxymethyl Butyrate (HMB)." *Natural Standard*. 2013. Web. 06 Aug. 2013.  
<<http://uw.naturalstandard.com/tools/handouts/hsf/patient-hydroxymethylbutyrate.asp>>.

Wilsom, Jacob M, Peter Fitschen, Bill Campbell, Gabriel Wilson, Nelo Zanchi, Lem Taylor, Colin Wilborn, Douglas Kalman, Jeffrey Stout, Jay Hoffman, Tim Ziegenfuss, Hector Lopez, Richard Kreider, Abbie Smith-Ryan, and Jose Antonio. "International Society of Sports Nutrition Position Stand: beta hydroxy-beta-methylbutyrate (HMB)." *Journal of the International Society of Sports Nutrition* 10.6 (2013): n. pag. Print.