

HMB Clinical Summary Overview

HMB (β -hydroxy- β -methylbutyrate) has been studied in healthy adults, alone and in combination with other amino acids, and as an adjunct to exercise to help improve body composition and performance. HMB has been extensively studied for over 20 years in various patient populations showing benefits to muscle health.

CITATION	STUDY OVERVIEW	CONCLUSION	Body Weight and Composition	Strength	Protein Synthesis or Breakdown	Other
Armani MP, et al. Study on comparison of muscle mass and strength response to supplements with β -hydroxy- β -methylbutyrate calcium in older adult inpatients. Abstract presented at FELANPE 2014.	Prospective, longitudinal, single-blind, randomized controlled clinical trial in 66 malnourished hospitalized older adults to determine whether muscle mass and strength were influenced when patients received oral or enteral nutritional supplements containing β -hydroxy- β -methylbutyrate (HMB), compared to those who receive equivalent standard oral nutrition supplements (ONS) without HMB. <ul style="list-style-type: none"> Subjects were assessed using the short form of the Mini Nutritional Assessment when admitted to Dr. I Pirovano Hospital over the period December 2013– February 2014. The Experimental Group (n=34) received an ONS with HMB and higher vitamin D levels and the Control Group (n=32) received standard ONS. 	Malnourished older adult inpatients experienced significant increases in both calf circumference and muscle strength, as measured by hand dynamometry, with consumption of an HMB and vitamin D enhanced formula compared to control.	✓	✓		
de Luis DA, et al. Effect on quality of life and hand grip strength by dynamometry of an enteral specific supplement with HMB and Vitamin D in elderly patients. <i>Nutr Hosp</i> 2015;32:202-207.	Study investigated the effect of strength and quality of life of an enhanced specific enteral formula with HMB and vitamin D in elderly patients. This open-label study included a total of 35 older adults (>65 years) with recent weight loss (>5% during previous 3 months).	Overall, this study showed that older adults with a previous weight loss and with a high consumption of an ONS with HMB and higher vitamin D levels had a significant improvement in anthropometric, biochemical parameters, handgrip strength, and quality of life. <ul style="list-style-type: none"> Subjects were divided into two groups based on median percentage of weight improvement – group 1 (<3.4% weight improvement) and group 2 (>3.4% weight improvement). In group 1, subjects showed an improvement in prealbumin and vitamin D levels. In group 2, subjects showed an improvement in BMI, weight, fat mass, fat-free mass, prealbumin, vitamin D levels, quality of life, and handgrip strength. 	✓	✓		✓
Deutz NE, et al. Effect of β -hydroxy- β -methylbutyrate (HMB) on lean body mass during 10 days of bed rest in older adults. <i>Clin Nutr</i> 2013;32:704-712.	Study was a randomized, controlled, double-blind design study in 24 healthy older adults confined to complete bed rest for 10 days, followed by resistance training rehabilitation for 8 weeks. The experimental group were treated with HMB twice daily (3 g/day). Control subjects were treated with an inactive placebo powder.	This study showed that in healthy older adults, HMB supplementation preserves muscle mass during 10 days of bed rest. <ul style="list-style-type: none"> At the end of the bed rest period, 19 subjects were evaluable (control n=8, HMB n=11). Bed rest caused a significant decrease in total lean body mass in the control group (-2.05 ± 0.66 kg; $P=0.02$). Treatment with HMB prevented the decline in lean body mass over bed rest (with the exclusion of one subject) (-0.17 ± 0.19 kg; $P=0.23$). There was a statistically significant difference ($P=0.04$) between treatment groups for change in lean body mass over bed rest. 	✓			
Hsieh LC, et al. Anti-inflammatory and anticatabolic effects of short-term β -hydroxy- β -methylbutyrate supplementation on chronic obstructive pulmonary disease patients in intensive care unit. <i>Asia Pac J Clin Nutr</i> 2006;15:544-550.	Study investigated the effect of beta-hydroxy-beta-methylbutyrate (HMB) supplementation on inflammation, protein metabolism, and pulmonary function in COPD patients in an intensive care unit.	This study suggests that HMB supplementation (3 g/day) may have anti-inflammatory and anticatabolic effect and improve pulmonary function in COPD patients in an intensive care unit setting. <ul style="list-style-type: none"> Results showed that white blood cell count, C-reactive protein, and creatinine were significantly lower, while cholesterol and total protein were significantly higher after HMB supplementation. The body weight remained unchanged in both groups. Ten subjects (55.6%) in the HMB group and 4 subjects (25.0%) in the control group had improved pulmonary function, indicated by their ventilator modes. 				✓
Molfino A, et al. β -hydroxy- β -methylbutyrate supplementation in health and disease: a systematic review of randomized trials. <i>Amino Acids</i> 2013;45:1273-1292.	Systematic review of the clinical literature on the effectiveness of HMB supplementation in healthy and pathological conditions. This review included randomized controlled trials.	Most of the selected studies showed the effectiveness of HMB in preventing exercise-related muscle damage in healthy trained and untrained individuals as well as muscle loss during chronic diseases.			✓	✓
Stout JR, et al. Effect of calcium β -hydroxy- β -methylbutyrate (CaHMB) with and without resistance training in men and women 65+ yrs: A randomized, double-blind pilot trial. <i>Exp Gerontol</i> 2013;48:1303-1310.	Study was a double-blind, placebo-controlled, trial in men and women age 65+ that occurred in 2 phases under ad libitum conditions. <ul style="list-style-type: none"> Phase 1: 2 non-exercise groups: (a) placebo and (b) 3 g CaHMB consumed twice daily Phase 2: 2 resistance exercise groups: (a) placebo and resistance exercise and (b) 3 g CaHMB consumed twice daily and resistance exercise 	Only HMB showed significant improvements ($P<0.05$) in total lean mass and leg extension/flexion, though no treatment effect was observed. HMB improved strength and muscle quality without resistance exercise. <ul style="list-style-type: none"> At 24 weeks of Phase 1, change in leg extension and leg muscle quality for HMB was significantly ($P<0.05$) greater than placebo group. Phase 2 demonstrated that resistance exercise significantly improved total lean mass, leg extension/flexion, handgrip strength, and get-up-and-go, with no difference between treatment groups. At week 24, only the HMB group significantly improved total fat mass and arm muscle. 	✓	✓		
Wu H, et al. Effect of β -hydroxy- β -methylbutyrate supplementation on muscle mass in older adults: a systematic review and meta-analysis. <i>Arch Gerontol Geriatr</i> 2015;61:168-175.	Systematic review and meta-analysis was conducted to evaluate whether HMB supplementation has beneficial effects on muscle in older adults.	HMB supplementation contributed to preservation of muscle mass in older adults. HMB supplementation may be useful in the prevention of muscle atrophy induced by bed rest or other factors. <ul style="list-style-type: none"> Meta-analysis showed greater muscle mass gain in the HMB groups compared with the control groups (standard mean difference = 0.352 kg; 95% confidence interval; 0.11,0.594; $P=0.004$). 	✓			

Over 70 Additional Citations Supporting The Effects Of HMB

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