

## Muscle Protect™ with HMB®

### Natural orange-flavored powder

### DESCRIPTION

Muscle Protect™ with HMB® provides a great-tasting, leucine-rich blend of essential amino acids combined with HMB®, vitamin D<sub>3</sub>, and glutamine for muscle maintenance. Leucine, a branched-chain amino acid, has an anabolic role in muscle protein synthesis and may specifically benefit aging adults by preserving healthy muscle mass and function. β-Hydroxy-β-methylbutyrate (HMB) is a metabolite of leucine that supports lean muscle mass through two unique mechanisms: decreased muscle degradation and increased protein synthesis. Vitamin D and glutamine provide additional support for muscle health.‡

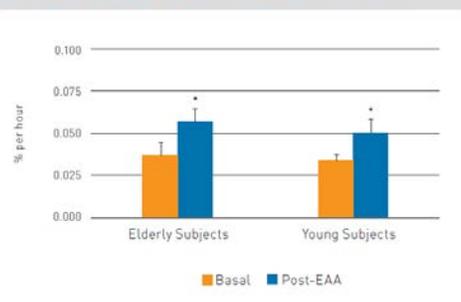
### INDICATIONS

- Supports healthy muscle mass and muscle function‡
- Provides anabolic muscle-building support‡
- Attenuates muscle protein breakdown and preserves lean muscle mass in both young and older adults‡

### FUNCTIONS AND MECHANISMS OF ACTION

Maintaining skeletal muscle mass and function is important for sustaining health throughout the lifespan. Physically inactive people can lose as much as 3% to 5% of their muscle mass for every 10 years past the age of 40. Even physically active people can experience at least some level of muscle loss. Among the blood amino acids, the essential amino acids (EAAs) are primarily responsible for the regulation of muscle protein synthesis, and among them, leucine has an important role in the regulation of muscle protein synthesis. Calcium β-Hydroxy-β-methylbutyrate-monohydrate (HMB) is a metabolite of leucine that decreases protein breakdown after a resistance workout by disrupting the ubiquitin proteasome proteolytic pathway. Several studies have indicated that HMB also stimulates protein synthesis through the activation of the mTOR pathway.‡

#### Increase in Muscle Protein Synthesis following a single dose of Amino 9™‡



Fractional synthetic rate (%/h) of mixed muscle protein in the basal state (Basal) and after the ingestion of 6.7 g of EAA (Post-EAA) containing 41% leucine.

\*Significantly different from the corresponding basal value (P < 0.05).

Am J Physiol Endocrinol Metab 291: E381-E387, 2006.

Research involving physically active older adults has shown improvement in subjects' muscle strength and function when HMB was included in their health routines. Although leucine offers similar benefits to HMB in increasing protein synthesis, HMB is more potent than leucine for promoting strength gains due to the dual benefit HMB provides in decreasing protein breakdown. Additionally, with 5% of leucine converted to HMB, it would take consuming 60 grams of leucine to produce 3 grams of HMB.

The Amino 9™ blend of essential and branched-chain amino acids has been clinically shown to boost muscle protein balance by increasing anabolism and limiting catabolism. Supplemental essential amino acids support muscle protein balance more than BCAAs alone. In a human clinical trial with elderly and young subjects where BCAAs were shown to stimulate 22% more muscle protein synthesis (MPS) than placebo, complementing them with all EAAs had 50% better MPS than BCAAs alone.‡

Vitamin D<sub>3</sub> has a positive effect on muscle protein and energy metabolism and is therefore necessary for healthy muscle function. Glutamine is an amino acid that acts as an essential substrate for enterocytes and immune cells, and its deficiency decreases protein synthesis in skeletal muscle. Therefore, adequate levels of both vitamin D and glutamine in the body may support healthy muscles.‡

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#### FORMULA (#57737P)

Serving size 1 scoop (9.15 g) contains:

Calories .....	20
Total Carbohydrate.....	<1 g
Vitamin D <sub>3</sub> (as cholecalciferol).....	12.5 mcg (500 IU)
L-Glutamine .....	2 g
myHMB® Calcium β-Hydroxy-β-methylbutyrate-monohydrate (HMB) .....	1.5 g
Amino 9™ Amino Blend .....	20
L-Leucine, L-Lysine, L-Threonine, L-Isoleucine, L-Valine, L-Phenylalanine, L-Methionine, L-Histidine, L-Tryptophan	

Other Ingredients: Natural flavors, Citric acid, Stevia leaf extract, Monk fruit extract, Turmeric (for color).

**Non- GMO, Gluten-Free**

Amino9™ is a registered trademark of Compound Solutions Inc.

MyHMB® Nutritional uses of Calcium Hydroxy Methylbutyrate Monohydrate (HMB) and Vitamin D are licensed to Douglas Laboratories under U.S. Patent # 8,815,280, # 9,259,430, #9,539,224 and #9,707,241.

#### SUGGESTED USE

As a dietary supplement, adults take 1 scoop, 1-2 times daily dissolved in 8-10 oz of water or other beverage, or as directed by a health professional.

#### SIDE EFFECTS

No adverse side effects reported.

#### STORAGE

Store in a cool, dry place, away from direct light. Use only if safety seal is intact.

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**For more information on Muscle Protect with HMB visit [douglaslabs.com](http://douglaslabs.com)**

‡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.

Manufactured for  
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