THE AIS SPORTS SUPPLEMENT FRAMEWORK
ABCD CLASSIFICATION SYSTEM

Summary Report: consideration for classification of a supplement ingredient

The ABCD Classification system ranks sports foods and supplement ingredients into four groups according to scientific evidence and other practical considerations that determine whether a product is safe, permitted, and effective in improving sports performance. The classification of supplements and sports foods is made via the consideration of the AIS Sports Supplement Framework Committee and evolves according to new knowledge plus the informed direction of our key stakeholders. This report summarises decisions made regarding the addition or reclassification of a substance within the System, based on evidence provided by the applicant and assessed (and potentially augmented) by the Framework Committee.

Summary Report following consideration of addition/alteration of supplement ingredient	
Name/ Formulation & description	β-hydroxy β-methylbutyrate (HMB) is a metabolite of the essential branch chain amino acid leucine, claimed to decrease muscle protein breakdown associated with exercise, increasing muscle mass and strength development associated with resistance training. HMB is also claimed to reduce muscle damage/soreness, enhancing recovery. Much of the initial research on HMB focused on animals, assessing the effect on carcass mass and quality, immune function, morbidity and mortality, colostral milk fat content, growth rates, safety and toxicity. Despite unconvincing results in animal research, HMB supplementation was applied to humans in the mid 1990's under the presumption that it may enhance gains in muscle size and strength while reducing muscle damage and soreness associated with resistance training and possibly enhance aerobic capacity (1). Two forms of HMB have been used: Calcium HMB (HMB-Ca) and a free acid form of HMB (HMB-FA). HMB-FA may increase plasma absorption and retention of HMB to a greater extent than HMB-CA. However, research with HMB-FA is in its infancy, and there is not enough research to support whether one form is superior.
Current AIS Supplement Framework Classification	Group B - Other
Agreed AIS Supplement Framework Classification	Group C
Proposed benefit(s)	1. Enhanced skeletal muscle hypertrophy & strength adaptation in response to resistance exercise. 2. Mitigation of exercise induced muscle damage and/or enhanced recovery following strenuous exercise. 3. Augment acute immune, inflammatory and endocrine responses following exercise. 4. Prevention of skeletal muscle disuse atrophy.
Proposed mechanism of action(s)	HMB induces acute muscle anabolism via increased in muscle protein synthesis (MPS) and reduced muscle protein breakdown (MPB) (2).
Summary of supporting evidence	While there is evidence to show acute HMB supplementation does stimulate MPS and moderate MPB, the effect is less than leucine ingestion alone and significantly less than acute whey protein ingestion (2). Acute HMB supplementation does not appear to influence serum testosterone and cortisol levels (3), nor indices of inflammation, such as C-reactive protein (4). There is preliminary evidence suggesting potential benefit in mitigating disuse atrophy, at least in older individuals (5).

Limitations to current science	When contrasted against accepted dietary interventions like post-exercise whey protein ingestion, HMB does not appear to further augment the response (6). Concerns have been raised about the integrity of recently published data on HMB supplementation across a 12-week training period, given the significance of the response (7).
Final consensus	While there is some evidence supporting the claims that HMB supplementation favourably influences skeletal muscle protein metabolism, efficacy is significantly less than that of leucine alone, and much less than acute ingestion of high biological value proteins. As such, these more efficacious interventions should be prioritised over HMB.
Appendices (attach studies, reviews, expert opinions)	1. Slater GJ, Logan PA, Boston T, Gore CJ, Stenhouse A, Hahn AG. Beta-hydroxy beta-methylbutyrate (HMB) supplementation does not influence the urinary testosterone: epitestosterone ratio in healthy males. J Sci Med Sport. 2000 Mar;3(1):79-83. 2. Wilkinson DJ, Hossain T, Hill DS, Phillips BE, Crossland H, Williams J, Loughna P, Churchward-Venne TA, Breen L, Phillips SM, Etheridge T, Rathmacher JA, Smith K, Szewczyk NJ, Atherton PJ. Effects of leucine and its metabolite β-hydroxy-β-methylbutyrate on human skeletal muscle protein metabolism. J Physiol. 2013 Jun 1;591(11):2911-23. 3. Teixeira FJ, Matias CN, Monteiro CP, Valamatos MJ, Reis JF, Tavares F, Batista A, Domingos C, Alves F, Sardinha LB, Phillips SM. Leucine Metabolites Do Not Enhance Training-induced Performance or Muscle Thickness. Med Sci Sports Exerc. 2019 Jan;51(1):56-64. 4. Wilson JM, Lowery RP, Joy JM, Walters JA, Baier SM, Fuller JC Jr, Stout JR, Norton LE, Sikorski EM, Wilson SM, Duncan NM, Zanchi NE, Rathmacher J. β-Hydroxy-β-methylbutyrate free acid reduces markers of exercise-induced muscle damage and improves recovery in resistance-trained men. Br J Nutr. 2013 Aug 28;110(3):538-44 5. Deutz NE, Pereira SL, Hays NP, Oliver JS, Edens NK, Evans CM, Wolfe RR. Effect of beta-hydroxy-beta-methylbutyrate (HMB) on lean body mass during 10 days of bed rest in older adults. Clin Nutr. 2013 Oct;32(5):704-12. 6. Jakubowski JS, Wong EPT, Nunes EA, Noguchi KS, Vandeweerd JK, Murphy KT, Morton RW, McGlory C, Phillips SM. Equivalent Hypertrophy and Strength Gains in β-Hydroxy-β-Methylbutyrate- or Leucine-supplemented Men. Med Sci Sports Exerc. 2019 Jan;51(1):65-74. 7. Wilson JM, Lowery RP, Joy JM, Andersen JC, Wilson SM, Stout JR, Duncan N, Fuller JC, Baier SM, Naimo MA, Rathmacher J. The effects of 12 weeks of beta-hydroxy-beta-methylbutyrate free acid supplementation on muscle mass, strength, and power in resistance-trained individuals: a randomized, double-blind, placebo-controlled study. Eur J Appl Physiol. 2014 Jun;114(6):1217-27.