

FORMULATORS GUIDE TO ENANTIOMERIC RATIOS OF (D) AND (L) BY CATEGORY AND SUBCATEGORY

The ratios of D/L arise from the specific physiological and biochemical needs addressed by each subcategory. While the main category sets the overarching theme—such as energy optimization for goBHB® Active or cognitive enhancement for goBHB® Neuro—each subcategory within it focuses on a distinct aspect of performance or health that requires tailored support. For example, within goBHB Active, performance-focused subcategories may prioritize D-BHB for immediate ATP production, while recovery-oriented subcategories may benefit from a slightly higher proportion of L-BHB to aid in inflammation management and oxidative stress reduction. Similarly, in goBHB Neuro, cognition and focus might emphasize balanced ratios for sustained energy and neurotransmitter modulation, whereas sleep requires greater L-BHB for its role in mood stabilization and neuroprotection. These variations ensure that each subcategory receives a ratio optimized for its unique demands. By addressing the nuanced requirements of each subcategory, the formulas achieve precision and flexibility within a unified framework.

goBHB® Active

goBHB Active reflects the need for an energy-dominant composition that also incorporates signaling support for recovery and stress adaptation. D-BHB is heavily involved in ATP production, which is critical for athletic performance, endurance, and pre-workout energy. It ensures the body has sufficient immediate energy for physical activities by directly supporting mitochondrial function. However, the L-BHB contributes to oxidative stress mitigation and muscle recovery, as demonstrated in our neurotransmitter study. The L-BHB component helps regulate glutamate and GABA balance, reducing excitotoxicity and stabilizing neural networks during and after intense physical exertion. This ratio provides a synergistic blend, ensuring sustained performance while minimizing oxidative damage.

SUBCATEGORY	D:L RATIO	SUGGESTIONS ON ADDITIVE OR SYNERGISTIC INGREDIENTS TO ADD
Dual Fuel	80/20	D-Ribose, Cluster Dextrin, Glucose
Performance	75/25	Betaine Anhydrous, Creatine, Citrulline
Recovery	70/30	Tart Cherry Juice, Pine Bark Extract
Endurance	80/20	Pyroloquinoline Quinone, Carbohydrates, Electrolytes
Pre-workout	75/25	Caffeine, L-Carnitine, Beta Alanine
Hydration	80/20	L-Alanyl-L-Glutamine, Sodium, Potassium, Magnesium, Calcium, Zinc

goBHB® Neuro

goBHB Neuro underscores the importance of energy production and signaling for cognitive function. D-BHB enhances dopamine and serotonin synthesis in the hippocampus, promoting focus, memory, and mental clarity. Meanwhile, L-BHB plays a vital role in mood regulation and stress reduction through its influence on serotonin pathways and glutamate-GABA balance. This balance is particularly critical for flow states, where sustained focus and adaptability require a combination of energy and neurotransmitter stability. goBHB Neuro supports both the immediate energy demands of cognitive tasks and the long-term signaling effects necessary for neuroprotection and mood stabilization.

SUBCATEGORY	D:L RATIO	SUGGESTIONS ON ADDITIVE OR SYNERGISTIC INGREDIENTS TO ADD
Flow	30/70	B-Vitamins, Paraxanthine
Cognition and Focus	45/55	Citicoline, alpha-Glycerophosphocholine
Memory, Cog Decline	35/65	Citicoline, Huperzine A
Sleep	40/60	Glycine, GABA, Lactium
Vision	50/50	Lutein, Zeaxanthin, Cyanidin-3-Glucoside
Stress/Anxiety	40/60	Theanine, Ashwagandha

goBHB® Renew

goBHB Renew prioritizes energy production while incorporating a robust signaling component to support cellular health and longevity. D-BHB is critical for ATP production, ensuring efficient mitochondrial function and sustaining cellular metabolism. The inclusion of L-BHB addresses inflammation and oxidative stress, as L-BHB enhances antioxidant activity through glutathione regulation and reduces excitotoxicity. This ratio is particularly suitable for applications like heart health, mitochondrial support, and cellular function, where the combination of energy and neuroprotection is essential. Our neurotransmitter study reinforces this approach by demonstrating L-BHB's role in reducing stress on cellular systems while maintaining energy stability.

SUBCATEGORY	D:L RATIO	SUGGESTIONS ON ADDITIVE OR SYNERGISTIC INGREDIENTS TO ADD
ATP	85/15	Glucose, D-Ribose, Adenosine Triphosphate Sodium, Creatine, Carnitine
Inflammation	70/30	Curcumin, Boswellia, White Willow Bark
Mitochondria Support	70/30	Pyroloquinoline quinone, Carnitine, Urolithin A
Heart Health	70/30	Coenzyme Q10, Garlic
Longevity	70/30	Fisetin
Metabolism	75/25	Beta-Aminoisobutyric Acid, Dihydroberberine, Bitter Melon Extract
Cellular Function	75/25	See above

goBHB® Lean

goBHB Lean reflects the need for a slightly higher energy emphasis to support metabolic processes like appetite suppression and weight loss while leveraging L-BHB’s signaling properties for metabolic and neurocognitive balance. D-BHB drives energy production and supports glucose regulation, critical for fasting states and diabetes management. The L-BHB inclusion helps modulate neurotransmitter pathways related to appetite, reducing stress-induced cravings through serotonin stabilization. Our neurotransmitter study further suggests that L-BHB’s influence on glutamate and GABA balance aids in metabolic resilience, making this ratio ideal for individuals seeking weight management or improved metabolic health.

SUBCATEGORY	D:L RATIO	SUGGESTIONS ON ADDITIVE OR SYNERGISTIC INGREDIENTS TO ADD
Appetite Suppression	60/40	Konjac Fiber (Glucomannan), DNF-10 Peptides, Saffron Extract
Semaglutides	50/50	Pep2Dia (Milk Peptides), Lemon Bioflavonoids, Butyric Acid
Weight Loss	60/40	Carnitine, Green Tea Extract, Capsaicinoids
Diabetes	70/30	Ceylon Cinnamon, Chromium, Vanadium, Berberine
Fasting	65/35	Electrolytes, L-Leucine, HMB

goBHB® Pet— D:L Ratio 90/10

goBHB Pet reflects a highly conservative approach, emphasizing the naturally occurring D-BHB enantiomer, which is critical for energy metabolism in animals. D-BHB is naturally produced in animals during periods of fasting or ketosis, making it a safe and efficient energy substrate. This D/L ratio ensures compatibility with known animal biochemistry while prioritizing safety, particularly for aging pets or those requiring additional energy support. By limiting L-BHB, the formula aligns closely with what is naturally detected in animals and avoids introducing unknown variables.

goBHB® Gaming— D:L Ratio 70/30

goBHB Gaming emphasizes sustained energy production to support prolonged focus and mental stamina required during intense gaming sessions. D-BHB fuels cognitive functions by enhancing mitochondrial efficiency and dopamine production, which are critical for sustained attention and reaction times. The L-BHB supports neurotransmitter balance, reducing stress and maintaining emotional stability under competitive conditions. This ratio reflects the need for a performance-driven energy substrate with sufficient signaling to prevent mental fatigue and stress-induced errors.

goBHB® Keto— D:L Ratio 80/20

goBHB Keto aligns with the ketogenic state's emphasis on D-BHB as the primary energy substrate replacing glucose. D-BHB efficiently supports mitochondrial ATP production, sustaining energy levels and fueling metabolic processes during ketosis. The smaller inclusion of L-BHB provides complementary benefits, such as mild neuroprotection and anti-inflammatory effects, without detracting from the formula's focus on energy delivery. This ratio optimizes the metabolic transition to ketosis by prioritizing D-BHB's role in glucose replacement while maintaining some signaling benefits for long-term brain and cellular health. It ensures that energy demands are met effectively while leveraging L-BHB's supportive properties in moderation.