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# Honey-β-Hydroxybutyrate Composition for Metabolic and Health Benefits

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## Abstract

A consistent supply of energy is more challenging to attain than many assume. High-fructose gels precipitate glucose and consequently decay rapidly. Ketone beverages may be smoother and usually do not upset the stomach. Another way is a raw honey-b-hydroxybutyrate (BHB) composition. Honey provides glucose and fructose to give direct glycolysis. BHB salts elevate the circulating ketones to be oxidized later. The hypothesis is that a controlled single dose of dual-fuel can enhance metabolic flexibility, gastrointestinal comfort, and functional product. In the present paper, the biochemical explanation, health-oriented benefits assessment, and medically relevant implications in the case of responsible consumption are described. It also defines the limits of dosing, safety indicators, and priorities to be validated.

## Health Benefits

### *Biphasic energy delivery and performance support*

Biphasic fueling is based on the kinetics of the substrates and task requirements. The glucose increases fast and aids the rapid production of ATP by glycolysis. BHB penetrates the cells via monocarboxylate transporters and is turned into acetyl-CoA, which is oxidized in the mitochondria. Exogenous ketosis is capable of providing oxidative substrate, but without an immediate insulin spike (Falkenhain et al., 2022). In humans, ingestion of ketones is found to modify the substrate utilization alongside cardiorespiratory reactions during exercise (McCarthy et al., 2021). Those changes can stabilize the working loads but deteriorate the results in case the peak power prevails (Whitfield et al., 2021). Honey maintains a moderate flow of carbohydrates when output is high and helps to manage the glycogen in the liver. Ketone availability can help decrease the need to regularly consume sugar during long sessions and potentially maintain mental performance during periods of extended work (Storoschuk et al., 2023). The objective of the practical is a more stable hourly energy.

### *Metabolic flexibility, appetite stability, and body composition support*

Metabolic flexibility refers to the process of changing between lipid-derived fuels and carbohydrate fuels based on the needs. Limited flexibility is linked to the decrease in insulin sensitivity and the changes in fuel partitioning (Monteyne et al., 2024). The flexibility can be supported with a dose of honey-BHB that provides both substrates in moderate proportions and also prefers not to use one of the pathways. Exogenous ketones can modify glucose and substrate oxidation, even though they are affected by formulation and the feeding state (Storoschuk et al., 2023). Clinical synthesis relates the replacement of Honey to cardiometabolic markers changes, the heterogeneity of which is due to the dose and the comparator (Yi et al., 2023). Normative glycemia can lower reactive hunger and enhance compliance with organized eating. Honey is one of the sources of sugar, and thus, dosing should remain focused and moderate.

***Microbiome support and gastrointestinal tolerance***

Gastrointestinal distress suppresses endurance fueling as well as ketone supplementation. Ketone salts may lead to nausea, cramps, and diarrhea, with repeated administration (Bolyard et al., 2023). The Honey could enhance tolerance through the action of matrix effects and gut ecology. Its viscosity can disperse salts and lower the localized hypertonicity. Oligosaccharides that are prebiotic in nature can also be found in honey. The description of microbiome modulation is introduced in the case of reviews of the evidence in models and preliminary observations in humans (Schell et al., 2022). Pure honey oligosaccharides are prebiotic in vitro (Wang et al., 2023). Honey polyphenols have the potential to mediate microbiota-host signaling and gut inflammation (Cardenas-Escudero et al., 2023). Manuka honey demonstrates bioactivity that is applicable in microbial ecology (Green et al., 2022). Clear mineral labelling and titration are necessary.

***Oxidative balance, inflammation modulation, and recovery support***

Honey phenolics contribute to the antioxidant potential, wherein there is a high level of variability across botanical sourcing and processing (Fratianni et al., 2023; Wilczynska and Zak, 2024). Reviews in clinical translations relate honey with mechanisms that inhibit oxidative damage and contain the inflammatory response, and context-dependent translations (Gajger et al., 2025). The BHB is also cited as a redox biology- and inflammation-modifying metabolite, though it has caloric content (Falkenhain et al., 2022). The consumption of ketones could modify the perceived effort and cardiorespiratory load and have the ability to affect pacing and recovery (McCarthy et al., 2021). A biphasic formula can facilitate the recovery process, reduce the massive glycemic variations, and preserve the oxidative synthesis of ATP (Storoschuk et al., 2023). The claims should be presented in the form of measurable phenomena, such as symptom score and certified biomarkers.

***In-vitro dosing, development, and end-user outcomes***

The dose discipline and form of delivery determine the health utility. Ketone salts are associated with tolerability with repeated use and thus grams per hour should be an individual and low number (Bolyard et al., 2023). Honey can be used in small quantities to provide palatability and rapid energy and reduce the total exposure to carbohydrates. The early use would have to be combined with the symptoms monitoring and, where possible, with finger-stick glucose and capillary BHB dynamic monitoring due to the response difference. Task stages should be associated with the duration of time spent on the exercise (Storoschuk et al., 2023). Test the mix when the person is performing work with high output in order to see what happens, and then take less maintenance in regular periods of activity. The feeding state and formulation changes ketone kinetics and actions, and, therefore, protocols are suggested to establish the time relative to meals and training (Falkenhain et al., 2022). To promote wellness, it is advised that Honey should be used as a substitute for extra calories as opposed to refined sugar (Yi et al., 2023). The assertions on the results should attach significance to the stability of energy and comfort on GI.

## Medical Benefits

***Glycemic control and insulin sensitivity implications***

Exogenous ketones can reduce blood glucose in an acute environment, and syntheses are highly heterogeneous and dose-dependent (Falkenhain et al., 2022). There are reports of short-term use of ketone monoester as a possible treatment in adults with type 2 diabetes, and it is usually tolerable, with quantifiable outcomes of glycemic indicators (Soto-Mota et al., 2021). Ketone ester ingestion has been stated to have an effect on postprandial glucose processing in adults with impaired glucose tolerance (Nakagata et al., 2021). It is possible that BHB can supply oxidative ATP when relative glucose is in short supply, and this will lead to less counter-regulatory stress responses. Honey is also a source of carbohydrate, although meta-analysis indicates that substitution effects can vary with refined sweeteners in controlled comparisons (Storoschuk et al., 2023). The liver preference of fructose can be beneficial in the form of hepatic glycogen and a more favorable transition between fasting and fed states in cases where doses are kept small. Medication-conscious vigilance and limited exposure to carbohydrates are medically responsible.

### *Cardiovascular stress adaptation and metabolic resilience*

Ketone bodies have been talked about as the adaptive fuels during stressed cardiac conditions and as the regulators of the mitochondrial and redox biology (Chu et al., 2021). Ventilation and perceived effort may also be different between exogenous ketones, and therefore, tolerability and context become significant (McCarthy et al., 2021). Honey contains polyphenols and other components associated with antioxidant and anti-inflammatory processes, and the effects of honey depend on the type and dosage (Fratianni et al., 2023). Clinical synthesis is an indication that cardiometabolic outcomes are heavily reliant on the things that honey is substituting in the diet (Gajger et al., 2025). The electrolytes provided by BHB salts can be helpful in hydration, but they are not desirable in hypertension, heart failure, and kidney disease. The framing of medicine should also focus on resilience endpoints and the labeling of the mined minerals.

### *Neurocognitive energy and resistance to stress*

The ketone bodies are addressed as the brain fuels and signaling molecules that preserve neuronal mechanisms of energy and resilience (Hernandez & Veech, 2021). Exogenous ketones have the capacity to increase circulating BHB without the need to maintain a very low-carbohydrate diet, which can be convenient in patients who cannot adhere to a very low-carbohydrate diet (Falkenhain et al., 2022). Honey can stabilize the hepatic glucose production and decrease stress-related glucose dips that deteriorate the concentration. The topic of honey polyphenols is also addressed as the regulators of oxidative balance that relates to the realization of cognition outcomes (Palma-Morales et al., 2023). Excessive consumption of honey may dull the elevation of ketones and augment glycemic load. Conscious protocols thus tolerate minimal honey and become palatable with the use of BHB as a permanent oxidative aid. Objective cognitive testing should be conducted over a period of hours and should be used to validate.

### *Antimicrobial and tissue-repair relevance*

Topical honey has proven clinical relevance in the management of wounds. Osmotic effects, peroxide generation, antimicrobial factors, and modulation of inflammation are described as advantages of reviewing and can support the healing process (Tashkandi, 2021; Ogwu and Izah, 2025). Such statistics do not warrant verbal arguments about the cure of the infection. They do endorse the validity of honey as a bioactive natural product. It has been commonly reported that manuka honey has antimicrobial performance, though the composition differs depending on the product and method of testing (Green et al., 2022). In the case of an oral honey-BHB supplement, supportive recovery use rather than therapy is the correct medical implication. The safety should involve allergy screening, infant warning, and microbial and heavy-metal control of the raw honey and mineral salts.

### *Safety limits, contraindications, and clinical follow-up*

The use of these in medicine must have clear safety limits. BHB salts contain sodium, potassium, calcium, and magnesium, which may be dangerous in chronic kidney disease, heart failure, or uncontrolled high blood pressure. GI symptoms can also be triggered by repeated doses of ketones and undermine hydration (Bolyard et al., 2023). Insulin-dependent and insulin secretagogue-dependent patients require glucose monitoring since ketones are capable of lowering glucose and altering the appetite signals (Soto-Mota et al., 2021). Postprandial dynamics might change among patients with impaired glucose tolerance following the ingestion of ketones (Nakagata et al., 2021). SGLT2 inhibitors should be used with care in users due to the risk of euglycemic ketoacidosis in a vulnerable environment. Raw honey brings about the element of allergy and should not be administered to babies. The honey and mineral salts should be tested in terms of microbial and heavy-metal analysis in quality systems.

## Conclusion

The Honey-BHB concept entails the mixing of two fuels at different times. Honey will provide rapid energy in carbohydrates and aid in the control of glycogen in the liver. BHB provides the later oxidative substrate and signaling metabolite. Such a combination may reduce the need to take a constant dosage of sugar and may make it more comfortable for specific users. The worth of health aims at sustaining the energy balance, improving GI tolerance, and promoting recovery. Under the obvious restrictions of safety, medical value, and directed to avoid stressful situations, and especially to control glucose levels by careful metabolic support. Efficient benefits should be designed in a standard manner, the labeling of the minerals ought to be clear, and the dose ought to be punitive. In fact, kinetics, safety, and meaningful results ought to be determined by a stringent controlled test, for broad adoption.

## References

1. Bolyard AJ., et al. "Tolerability and feasibility of repeated consumption of β-hydroxybutyrate salts or ketone monoesters in healthy adults". Nutrients 15.23 (2023): 4876.
2. Cárdenas-Escudero C, Gutiérrez LF and Vargas ML. "Honey polyphenols and gut microbiota: A review of interactions and implications for host health". Food & Function 14.2 (2023): 602-620.
3. Chu Y, Zhang L and Xie M. "Ketone bodies in stressed hearts: Friend or foe?". Frontiers in Aging 2 (2021): 681513.
4. Falkenhain K, Rohrer L and Rist MJ. "Exogenous ketones: Metabolic effects, safety, and potential therapeutic applications". Advances in Nutrition 13.5 (2022): 1643-1660.
5. Fratianni F, Cardinale F and Nazzaro F. "Polyphenols and bioactivity of Honey: Composition, antioxidant capacity, and health implications". Foods 12.18 (2023): 3338.
6. Gajger IT., et al. "Honey and oxidative stress: Mechanisms and therapeutic perspectives". Antioxidants 14.8 (2025): 959.
7. Green AC, Hammer KA and Johns MR. "Bioactivity of manuka honey and related honeys: Implications for antimicrobial and microbiome interactions". PLOS ONE 17.8 (2022): e0272376.
8. Hernandez AR and Veech RL. "Ketone bodies in the brain: Metabolic and signaling roles in neuronal function and resilience". Frontiers in Molecular Neuroscience 14 (2021): 732120.
9. McCarthy MC, Bostad WL and Stöggl T. "Increased cardiorespiratory stress during submaximal cycling after ketone monoester ingestion". Applied Physiology, Nutrition, and Metabolism 46.6 (2021): 639-647.
10. Monteyne AJ, Coeckelberghs E and Van Thienen R. "Ketone ester supplementation and metabolic flexibility: Implications for insulin sensitivity and substrate utilization". Diabetologia 67.5 (2024): 1012-1025.
11. Nakagata T, Matsui T and Oda H. "Effects of ketone ester ingestion on postprandial glucose metabolism in adults with impaired glucose tolerance". Journal of Diabetes Investigation 12.9 (2021): 1598-1607.
12. Ogwu C and Izah SC. "Honey as a natural antimicrobial: Mechanisms and clinical applications". Antibiotics 14.3 (2025): 255.
13. Palma-Morales M, López-Romero P and García-Serrano S. "Honey polyphenols and cognition-related outcomes: Mechanisms and experimental evidence". Nutrients 15.13 (2023): 3056.
14. Schell JC, O'Brien CM and Mokoena MP. "Honey as a prebiotic food: Effects on the gut microbiome and health implications". Frontiers in Nutrition 9 (2022): 957932.
15. Soto-Mota A., et al. "Exogenous ketosis in adults with type 2 diabetes: Feasibility, tolerability, and metabolic effects". Endocrinology, Diabetes & Metabolism 4.3 (2021): e00264.
16. Storoschuk EE, Wood TR and Stubbs BJ. "Exogenous ketones in human physiology: Kinetics, performance outcomes, and tolerability considerations". Frontiers in Physiology 14 (2023): 1202186.
17. Tashkandi H. "Honey in wound management: Mechanisms and clinical considerations". Open Life Sciences 16.1 (2021): 1094-1106.
18. Wang X, Qiu S and Zhu Y. "Honey oligosaccharides as prebiotics: Structural features and functional activity". Food Chemistry 416 (2023): 138060.
19. Whitfield J., et al. "Acute ketogenic diet and ketone ester supplementation impair race walk performance". Medicine & Science in

Sports & Exercise 53.10 (2021): 2130-2141.

20. Wilczyńska A and Żak N. “Polyphenols as the main compounds influencing the antioxidant effect of Honey: Composition and biological relevance”. International Journal of Molecular Sciences 25.19 (2024): 10606.
21. Yi X, Wang Y and Chen J. “Honey consumption and cardiometabolic health: A systematic review and meta-analysis”. Nutrition Reviews 81.10 (2023): 1215-1232.