DESCRIPTION
Breakthrough Exogenous Ketone Fat-Burning Formulation — for energy, athletic performance, mental focus, lean body mass enhancement or anti-aging; delivers a distinct pharmacology to activate HCAR (Hydroxycarboxylic Acid Receptor) and FFAR (Free Fatty Acid Receptor) fat β-oxidation for long lived energy; a metabolic and cellular prompt (Nrf2 transcription factor induction) to heighten intracellular antioxidant protection; and a complement of key electrolytes... all without the gastrointestinal distress and excessive sodium load that is common with ketone or MCT-based formulations.

PRODUCT CODE: 102000000018
COUNTRY OF ORIGIN: CANADA

STORAGE: Store in a dry place, away from strong direct light and heat.

SHELF LIFE: 2 years

TABLE

<table>
<thead>
<tr>
<th>TESTS</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSAY (BY HPLC)</td>
<td></td>
</tr>
<tr>
<td>Magnesium β-hydroxybutyrate</td>
<td>25% of total</td>
</tr>
<tr>
<td>Sodium β-hydroxybutyrate</td>
<td>8.3% of total</td>
</tr>
<tr>
<td>Butanoic acid AS CALCIUM BUTYRATE</td>
<td>16.7% of total</td>
</tr>
<tr>
<td>Butanoic acid AS MAGNESIUM BUTYRATE</td>
<td>50% of total</td>
</tr>
<tr>
<td>Appearance</td>
<td>Off white hygroscopic powder</td>
</tr>
<tr>
<td>Solubility</td>
<td>Aqueous soluble</td>
</tr>
<tr>
<td>Odor</td>
<td>Characteristic fruity</td>
</tr>
<tr>
<td>Taste</td>
<td>Characteristic fruity</td>
</tr>
<tr>
<td>Mesh Size</td>
<td>80 mesh</td>
</tr>
</tbody>
</table>

CHEMICAL TESTS

<table>
<thead>
<tr>
<th>EXTRACT SOLVENT (PPM BY GC)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl Acetate</td>
<td>&lt; 700</td>
</tr>
<tr>
<td>Methanol</td>
<td>&lt; 400</td>
</tr>
<tr>
<td>Toluene</td>
<td>0</td>
</tr>
<tr>
<td>Hexane</td>
<td>0</td>
</tr>
<tr>
<td>n-Butanol</td>
<td>0</td>
</tr>
</tbody>
</table>

HEAVY METALS

| Cd                           | 0.001%               |
| Hg                           | 0.001%               |
| As                           | 0.001%               |
| Pb                           | 0.001%               |

MICROBIOLOGICAL

| Total Plate Count            | < 300/g              |
| Yeast & Mould                | < 50/g               |
| Salmonella                   | Negative             |
| Staphylococcus              | Negative             |
| E. Coli                     | Negative             |
| Pseudomonas aeruginosa       | Negative             |

UNIQUE FEATURES:

- Novel Patent-pending Biotechnology
- Electrolyte-balanced Ketone technology
- Synergised β-HB with β-oxidation inducer
- Low sodium delivery (<50 mg per dose)
- Coupled to short chain fatty acid technology
- Facilitates colonic water reabsorption
- Facilitates electrolyte reabsorption
- Dissolves instantly into a clear liquid
- Supports healthy probiotic bacteria culture
- Technology makes a delicious light thirst quenching beverage
- No lactose or galactose
**ABSTRACT:**

...a specified protocol is recommended involving the administration of an exogenous ketone, \(\beta\)-hydroxybutyrate (BHB), accompanied specifically by the short chain fatty acid, butyrate (BA).

This coupling is designed primarily to deliver the benefits associated with elevated serum ketones while avoiding the gastrointestinal distress and sodium load that is common with ketone or MCT-based formulations. This novel BHB–BA combination is shown to deliver synergistic activity based on current knowledge of the two ligands that can both also serve as substrates in the TCA cycle as ATP substrates.

It is demonstrated that the synergy provided by the combination of these two substrates expands beyond receptor induction that supports improved inflammatory control; and beyond again their combined roles as ATP substrates. BA is also shown to induce endogenous ketogenesis via hepatic \(\beta\)–oxidation facilitating the ketogenic process and expediting completion of the ketogenic diet's initialization phase.

To expedite ketogenesis is to fast-track the initialisation period and help overcome energy deficit (low carb–flu) as well as likely improve patient or consumer compliance. This period is characterised by a slow transition from glucose as a primary energy substrate to the ketone as the prevalent ATP substrate. To orally administer a moderate dose of the exogenous ketone (or ketone body) concurrently further supports a low risk ketogenic initiative by improving ATP substrate availability.

This exogenous ketone administration can take place while on or independent of the LCHF diet. The oral BHB–BA strategy is of further value due to the need for lower dosing of the health supportive BHB when in combination with BA. Nevertheless, the benefits associated with the ligand–receptor interactions associated with BHB and BA can be leveraged in the absence of the restrictive diet by supplementation of the BHB–BA blend.

To complement the meta–analysis and the dietary and supplement recommendations, novel laboratory results are presented in the form of clinical and pharmacological data demonstrating Nrf2 induction by KETOBA™ at lower serum BHB levels than with BHB alone. The consequential increase in endogenous glutathione and hemeoxygenase–1 are also presented in this review as additional evidence supporting the added value of orally administered BHB–BA strategy...
WHAT IS IN KETOBA™?

Supports a ketogenic diet or other therapeutic program to treat metabolic syndrome [1]; epilepsy [2]; cognitive deficit [3]; neurological disorders like Alzheimer's disease where its shown to down regulate deleterious amyloid protein [4]; Supports initiative to reduce seizure frequency [5] help treat even drug-resistant epilepsy [6] [7, 8]; serve as energy substrates for the brain [9] [10]; shown to stimulate neurogenesis in the ischemic brain via brain derived neurotrophic factor (BDNF) upregulation [11]. It has anti-depressant-like effects on neurons [12].

Reported to protect against diet-induced obesity [13] [14]; has been shown to improve appetite and food portion control [15]; activator of uncoupling protein activity for thermogenesis [16]; and weight loss [17]; mice fed this ingredient remain lean (despite dietary calorie load) [13]; avoid metabolic problems; have increased energy expenditure in the form of body heat generation; and tend to have higher physical activity [18] [19]; supports insulin sensitivity systemically [20]; shown to induce GLP–1 secretion [21] a hormone known to support the improvement of glucose tolerance and appetite control.

Shown to have a significant preventive influence on cardiovascular health [22] [23]; reduce serum triglycerides by as much as 50% compared to controls [24]; lowers cholesterol production [24], and in in most tissues of the body including the heart [25].

Helps regulate and maintain the healthy gut microbe population while altering the luminal environment to void pathogens [26] [20].

**Green tea extract**

Supports insulin sensitivity [27]; antioxidant that inhibits amylase and glucosidase activity to slow carbohydrate food digestion in treatment of type 2 diabetic condition [28]

**Vitamin C (calcium ascorbate, ascorbic acid)** 100 mg

Supports adrenal function [29] [30]; supports features of immunity when part of an antioxidant program [31]

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Vitamin B1 (Thiamine HCl)</td>
<td>1.0 mg</td>
</tr>
<tr>
<td>Vitamin B2 (Riboflavin – 5 Phosphate, Riboflavin)</td>
<td>1.0 mg</td>
</tr>
<tr>
<td>Vitamin B3 (Niacin, Niacinamide)</td>
<td>1.0 mg</td>
</tr>
<tr>
<td>Vitamin B12 (methylcobalamine)</td>
<td>250 mcg</td>
</tr>
</tbody>
</table>

Supports metabolism as coenzymes involved key cell activities[32]; cofactor activity in the conversion of carbohydrates to energy [33]; Supports cardiovascular health and peripheral blood flow [34] [35] [36]; Cofactors in homocysteine neutralisation [37] [38] [39] [40]; Key nutrient for normal neurological function and healthy neuron restoration [38, 41].
Potassium (citrate)  
53 mg  
Common electrolyte supports bone mineralisation [42]; physiological and physiochemical correction to prevent calcium-based stone formation (as in kidney stone/nephrolithiasis) [43] [44]

Calcium (carbonate)  
56 mg  
Recommended against bone loss [45];

Copper (Bisglycinate)  
0.5 mg  
Essential element as a cofactor for various enzymes supporting cardiovascular health, a deficiency of which could adversely affect cardiovascular health [46];

Zinc (Citrate)  
2.5 mg  
Better solubility and absorption over zinc oxide [46]; essential element when supplemented shown to improve morbidity in populations at risk [47]; supports healthy growth and development [48]

Manganese (Citrate)  
0.5 mg  
Supports healthy development; deficiency can result bone anomalies, growth retardation and poor neurological development [49];

Molybdenum (sodium molybdate)  
15.0 mcg  
Essential for good health [50]

Chromium (GTF)  
32.5 mcg  
Chromium is an essential nutrient shown in this form to counter features of diabetes [51]; supports healthy sugar uptake by cells [52]; helps reduce serum lipids [53]; supports insulin signalling and serum sugar clearance [51];

Selenium (L-Methionine)  
15.0 mcg  
Essential element in this form is favoured over other supplement forms [54]; key cofactor in glutathione activity [55]

Boron Citrate  
175 mg  
Supports bone health/strength[56]; may support regulation of arthritic pain [56]

Proprietary SuperFruitBlend (1420 mg):  
Natural Mango Flavor  
Natural Peach Flavor  
Malic Acid  
Citric Acid  
Natural Masking Flavors  
Prosweet Masking Flavor  
Stevia Extract  
Stevia Leaf Powder  
Antioxidant support  
Prebiotic support  
Natural vitamins, minerals/electrolytes
REFERENCES

42. Vescini, F., et al., Long–term potassium citrate therapy and bone mineral density in idiopathic