Clinical Studies: KetoFast

Background

Ketosis is the process wherein the body produces ketones from fatty acids as a source of energy. Typically this occurs during states of fasting/starvation, with restricted carbohydrate intake or after strenuous exercise when glucose levels are low. There are three endogenous ketones - acetoacetate, beta-hydroxybutyrate and acetone – which can cross the blood-brain barrier and supply energy to the central nervous, cardiovascular and muscular systems.

The “ketogenic diet” is based on forced ketosis induced by restricted carbohydrate (glucose) intake causing the utilization of fat as energy.

Key Ingredients & Clinical Evidence

β-Hydroxybutyric Acid (β-Hydroxybutyrate, BHB)

As sodium, magnesium, calcium salts

As exogenous ketones, supplementation with BHB improves exercise performance and recovery; crosses the blood-brain barrier as a source of cerebral energy; and, reduces ghrelin levels and appetite, causing weight loss primarily by fat reduction.

Clinical Studies:

- **Mansor L, Woo G.** Ketones for Post-exercise Recovery: Potential Applications and Mechanisms. *Front Physiol.* 2021; 11:613648.
- **Prado E, de Rezende N, de Almeida R et al.** Keto analogue and amino acid supplementation affects the ammonaemia response during exercise under ketogenic conditions. *Br J Nutr.* 2011; 105(12):1729-33.
- **Cox P, Kirk T, Ashmore T et al.** Nutritional Ketosis Alters Fuel Preference and Thereby Endurance Performance in Athletes. *Cell Metab.* 2016; 24(2):256-68.
- **PoffÉ C, Ramaekers M, Bogaerts S et al.** Bicarbonate Unlocks the Ergogenic Action of Ketone Monoester Intake in Endurance Exercise. *Med Sci Sports Exerc.* 2021; 53(2):431-441.
- **Holdsworth D, Cox P, Kirk T et al.** A Ketone Ester Drink Increases Postexercise Muscle Glycogen Synthesis in Humans. *Med Sci Sports Exerc.* 2017; 49(9):1789-1795.
- **Vandoorne T, De Smet S, Ramaekers M et al.** Ketone Ester Drink during Recovery from Exercise Promotes mTORC1 Signaling but Not Glycogen Resynthesis in Human Muscle. *Front Physiol.* 2017; 8:310.
- **White H, Venkatesh B.** Clinical review: ketones and brain injury. *Crit Care.* 2011; 15(2):219.
- **Owen O, Morgan A, Kemp H et al.** Brain metabolism during fasting. *J Clin Invest.* 1967; 46(10):1589-95.

- **Prins M.** Cerebral metabolic adaptation and ketone metabolism after brain injury. *J Cereb Blood Flow Metab.* 2008; 28(1):1-16.
- **Reger M, Henderson S, Hale C et al.** Effects of beta-hydroxybutyrate on cognition in memory-impaired adults. *Neurobiol Aging.* 2004; 25(3):311-4.
- **Stubbs B, Cox P, Evans R et al.** A Ketone Ester Drink Lowers Human Ghrelin and Appetite. *Obesity (Silver Spring).* 2018; 26(2):269-273.
- **Nymo S, Coutinho S, Jørgensen J et al.** Timeline of changes in appetite during weight loss with a ketogenic diet. *Int J Obes (Lond).* 2017; 41(8):1224-1231.
- **Deemer S, Plaisance E, Martins C.** Impact of ketosis on appetite regulation-a review. *Nutr Res.* 2020; 77:1-11.
- **Gibson A, Seimon R, Lee C et al.** Do ketogenic diets really suppress appetite? A systematic review and meta-analysis. *Obes Rev.* 2015; 16(1):64-76.

Medium Chain Triglycerides (MCT)

Caprylic, capric acids

MCT are more quickly absorbed, diffusing into the intestines and bypassing liver metabolism required for long-chain fatty acids. They enhance thermogenesis, provide energy faster and increase satiety, reducing appetite and food intake.

Clinical Studies:

- **Ledeboer M, Masclee A, Jansen J et al.** Effect of equimolar amounts of long-chain triglycerides and medium-chain triglycerides on small-bowel transit time in humans. *JPEN J Parenter Enteral Nutr.* 1995; 19(1):5-8.
- **Maher T, Sampson A, Goslawska M et al.** Food Intake and Satiety Response after Medium-Chain Triglycerides Ingested as Solid or Liquid. *Nutrients.* 2019; 11(7):1638.
- **St-Onge M, Jones P.** Greater rise in fat oxidation with medium-chain triglyceride consumption relative to long-chain triglyceride is associated with lower initial body weight and greater loss of subcutaneous adipose tissue. *Int J Obes Relat Metab Disord.* 2003; 27(12):1565-71.
- **Kinsella R, Maher T, Clegg M.** Coconut oil has less satiating properties than medium chain triglyceride oil. *Physiol Behav.* 2017; 179:422-426.
- **St-Onge M, Bosarge A.** Weight-loss diet that includes consumption of medium-chain triacylglycerol oil leads to a greater rate of weight and fat mass loss than does olive oil. *Am J Clin Nutr.* 2008; 87(3):621-6.
- **Coleman H, Quinn P, Clegg M.** Medium-chain triglycerides and conjugated linoleic acids in beverage form increase satiety and reduce food intake in humans. *Nutr Res.* 2016; 36(6):526-33.
- **St-Onge M, Ross R, Parsons W et al.** Medium-chain triglycerides increase energy expenditure and decrease adiposity in overweight men. *Obes Res.* 2003; 11(3):395-402.

- **Vandenberghe C, Castellano C, Maltais M et al.** A short-term intervention combining aerobic exercise with medium-chain triglycerides (MCT) is more ketogenic than either MCT or aerobic exercise alone: a comparison of normoglycemic and prediabetic older women. *Appl Physiol Nutr Metab.* 2019; 44(1):66-73.
- **St-Onge M, Mayrsohn B, O'Keeffe M et al.** Impact of medium and long chain triglycerides consumption on appetite and food intake in overweight men. *Eur J Clin Nutr.* 2014; 68(10):1134-40.
- **Kasai M, Maki H, Nosaka N et al.** Effect of medium-chain triglycerides on the postprandial triglyceride concentration in healthy men. *Biosci Biotechnol Biochem.* 2003; 67(1):46-53.

L-Arginine α-ketoglutarate (AAKG)

Increases vasodilation, blood flow and exercise performance

Clinical Studies:

- **Willoughby D, Boucher T, Reid J et al.** Effects of 7 days of arginine-alpha-ketoglutarate supplementation on blood flow, plasma L-arginine, nitric oxide metabolites, and asymmetric dimethyl arginine after resistance exercise. *Int J Sport Nutr Exerc Metab.* 2011; 21(4):291-9.
- **Álvares T, Meirelles C, Bhambhani Y et al.** L-Arginine as a potential ergogenic aid in healthy subjects. *Sports Med.* 2011; 41(3):233-48.
- **Campbell B, Roberts M, Kerksick C et al.** Pharmacokinetics, safety, and effects on exercise performance of L-arginine alpha-ketoglutarate in trained adult men. *Nutrition.* 2006; 22(9):872-81.

7-Keto-dehydroepiandrosterone (7-keto-DHEA)

Regulates the hormonal signal for fat formation and distribution; increases resting metabolic rate (metabolism); and, is more efficient at thermogenesis than DHEA.

Clinical Studies:

- **Sedláčková B, Dušátková L, Zamrazilová H et al.** 7-oxygenated derivatives of dehydroepiandrosterone and obesity. *Prague Med Rep.* 2012; 113(2):147-55.
- **Hampl R, Stárka L, Janský L.** Steroids and thermogenesis. *Physiol Res.* 2006; 55(2):123-31.
- **Zenk J, Frestedt J, Kuskowski M.** HUM5007, a novel combination of thermogenic compounds, and 3-acetyl-7-oxo-dehydroepiandrosterone: each increases the resting metabolic rate of overweight adults. *J Nutr Biochem.* 2007; 18(9):629-34.
- **Davidson M, Marwah A, Sawchuk R et al.** Safety and pharmacokinetic study with escalating doses of 3-acetyl-7-oxo-dehydroepiandrosterone in healthy male volunteers. *Clin Invest Med.* 2000; 23(5):300-10.
- **Kalman D, Colker C, Swain M et al.** A randomized, double-blind, placebo-controlled study of 3-acetyl-7-oxo-dehydroepiandrosterone in healthy overweight adults. *Curr Ther Res.* 2000; 61:435-442.

These clinical studies demonstrate the scientific foundation behind KetoFast's formulation and its potential benefits for weight management, energy production, and metabolic health.