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Effects of a ketogenic diet and exogenous ketone supplementation on body composition, health and exercise performance

Ketone bodies are a fuel source supplied either endogenously by the liver during periods of carbohydrate restriction (i.e., a very low carbohydrate, ketogenic diet) or exogenously through supplementation. All tissues, except red blood cells and liver cells, can utilize ketone bodies as an alternate energy source in place of glucose. The brain typically derives 100% of its energy from glucose however, ketone bodies can provide more than 50% of the brain's energy when adapted to a ketogenic diet. Consequently, ketone bodies aid in the maintenance of blood glucose levels, allow for a reduced rate of gluconeogenesis and spare muscle protein. The body transitions from a state of fat storage to fat breakdown when adapted to a ketogenic diet. Thus, a ketogenic diet may lead to optimal body composition and energy levels due to increased fat breakdown, spared muscle protein, maintained blood glucose levels and enhanced ketone body delivery for fuel. Acute exogenous ketone supplementation may produce biochemical similarities to a ketogenic diet in terms of energy provision and oxidative stress reduction. Ketone supplementation provides an energy source for the brain and peripheral tissues, especially when glycogen stores and glucose levels become altered by exercise, which may reduce central fatigue and promote faster recovery between bouts of exercise. We will discuss the research that has examined the effects of a ketogenic diet and exogenous ketone supplementation on fuel supply, body composition, central and peripheral fatigue, endurance exercise and strength training.

Biography

Angelia Maleah Holland is an Assistant Professor at Augusta University in Augusta, GA. Her research focuses on the ketogenic diet and ketone supplementation in regards to body composition, cognitive performance, cardiovascular health and exercise performance. She received her bachelor's degree from the University of North Carolina at Chapel Hill, master's degree from Indiana University and PhD from Auburn University in fields related to Exercise Science. She also writes for ketogenic.com.

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