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Fasting and Fitness: Understanding metabolic fuels and how to optimize them

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Statement of the Problem: While fasting has been practiced for centuries, our understanding of how to balance it with physical fitness is just emerging. The effects of fasting (in all its variations) are complex and require adequate understanding of several key metabolic pathways to apply it properly in fitness settings. Central to this understanding are the drivers of metabolic switching between glucose and fatty acid-derived ketones.

Orientation: With metabolic switching as the forerunner, my team has several experiments to uncover the impact of fasting in a variety of settings. This includes combining fasting with exercise to examine they synergistic effects of these on the time it takes to reach nutritional ketosis. Additional studies have tested the impact of beginning and breaking fasts with certain macronutrients in hopes of optimizing the metabolic effects of these efforts.

Findings: Starting a fast with a low-carbohydrate diet increases ketones by 64%, decreases glucose by 47%, keeps insulin concentrations low, and increases glucagon, GLP-1 and GIP concentrations. Similarly, breaking a fast with low-carbohydrate diet increases ketones by 69%, decreases glucose by 14%, keeps insulin concentrations low, and increases glucagon, GLP-1, and GIP. Beginning a fast with aerobic exercise increases ketones by 43% and ketosis was reached 3.5 h sooner. Using exercise to "cheat" in a fast by exercising immediately after food intake was effective at recovering fasted concentrations of ketones and glucose and also temporarily decreases.

Conclusion & Significance: Because metabolic health is at the core of overall health, it is important to find ways to improve and optimize it. While there are benefits of fasting and exercise that are unique to each practice, there are also many overlapping benefits that can work synergistically to improve metabolic health.

Biography

Landon recently joined the Physical Activity and Weight Management Division at the University of Kansas Medical Centre. He earned a master's and Ph.D. in Exercise Science from Brigham Young University where he focused his research on the metabolic effects of intermittent fasting. Additionally, Landon has experience in healthcare management and sports medicine. When he's not thinking about improving human health, he spends time with his wife and 5 children playing outdoors and engaging in the community.