Ketogenic diet on body composition in resistance training females.

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Commentary

A ketogenic diet is a high-fat (70-75%), low-carbohydrate (5-10%) and moderate-protein (15-20%) diet. This type of diet is vastly different than the typical western diet, of which carbohydrates generally make up the majority of calories consumed (50-60%), and followed by fat (25-35%) and protein (10-20%). Ketogenic diets have been found to be effective in managing several chronic conditions, such as epilepsy, metabolic syndrome, diabetes, cancers, and Alzheimer's disease. Furthermore, high fat, low carbohydrate diets have been found to enhance performance among endurance athletes and improve overall body composition. For these reasons, research into the benefits of a ketogenic diet among the exercising population has increased over the years.

The intake of carbohydrates increases blood glucose, which in turn triggers an insulin response. Glucose is the main energy source for all metabolic processes and is particularly important in providing energy during exercise. When glucose and insulin are high, fat metabolism and fat oxidation are inhibited, and the body goes into a fat storing mode rather than a fat burning mode. On the other hand, when carbohydrate intake is low, or when carbohydrate stores (in the form of glycogen) are exhausted such as during a prolonged bout of endurance exercise, fatty acids can be broken down for energy. Additionally, when carbohydrate intake is minimal, ketones (a metabolic by-product of fat metabolism) are produced, which are further used by the body for energy. Theoretically, limited glycogen stores lead to limited exercise capacity, while unlimited fat stores will lead to longer exercise capacity. Research has supported this notion that reliance on fats, not carbohydrates, can lead to enhanced endurance performance.

Athletes have taken an interest in how ketogenic diets can help fuel their exercise training and performance. Some studies have demonstrated that high fat, low carbohydrate diets can improve endurance performance via increased capacity for and efficiency of fat oxidation. More recently, strength and power athletes have turned to the ketogenic diet in the interest of losing body fat and improving lean body mass. Wilson and colleagues investigated the impact of an isocaloric and isonitrogenous ketogenic diet versus a traditional western diet on changes in body composition, performance, blood lipids, and hormonal profiles in male resistance-trained athletes. Participants followed either a ketogenic Diet (KD) or a traditional Western Diet (WD) for 11 weeks while participating in a resistance training program. Body composition, strength, power, blood lipid profiles and testosterone levels were all assessed.

Following a Very Low Carbohydrate Ketogenic Diet (VLCKD) for a relatively short period of time (i.e., 30 days) can decrease body weight and body fat without negative effects on strength performance in high level athletes. In a study examining the effects of a low carbohydrate diet on power, Paoli and colleagues found that a ketogenic diet did not affect strength performance in elite artistic gymnasts. Before and after the diet, body composition and various performance aspects (hanging straight leg raise, ground push up, parallel bar dips, pull up, squat jump, countermovement jump, and 30 sec continuous jumps) were assessed. After three months the same protocol and tests were performed before and after 30 days of the athletes' usual diet (a typically western diet, WD). No significant differences were detected between VLCKD and WD in all strength tests. Significant differences were found in body weight and body composition: after VLCKD there was a decrease in body weight and fat mass.

Weight loss can have positive health benefits and can have performance benefits for certain athletic populations. This is especially true if the weight lost comes from fat mass rather than lean body mass.

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