

## **Effects of a 500-mile Backpacking Hike on the Performance of a Competitive Powerlifter**

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### ABSTRACT

The purpose of this study was to evaluate the effects of a long-distance backpacking trip and a high protein diet on body composition, strength, power, and aerobic performance. A single participant (male, aged 29 years) hiked 34 days on the Colorado Trail. Dependent variables were assessed pre-hike and post-hike and included body mass, body fat percentage, bone mineral density, maximum oxygen consumption ( $VO_{2max}$ ), resting metabolic rate (RMR), total cholesterol, triglycerides, high density lipoprotein (HDL), low density lipoprotein (LDL). Cardiovascular dependent variables included resting heart rate, systolic blood pressure (SBP) and diastolic blood pressure (DBP). Other performance outcomes included strength in squat, bench press, and deadlift, and vertical leap. Resting heart rate and a journal documenting a breakdown of calories expended and calories consumed were recorded daily while on the hike. The average daily duration of a hike was  $8:43 \pm 1:45$  hours. The participant's mass decreased by 2.5 kg (4% of body weight), body fat decreased by 1.2%, RMR decreased by 5 kcal/day, and  $VO_{2max}$  increased by 8.7 mL/kg/min (17%). Among metabolic variables, total cholesterol increased by 18 mg/dL (10%); triglyceride concentration decreased by 23 mg/dL (29%); HDL decreased by 1 mg/dL (2%), and; LDL increased by 24 mg/dL (23%). With regard to cardiovascular variables, resting heart rate decreased from 85 bpm to 67 bpm (21%), SBP decreased by 39 mmHg (27%), and DBP decreased by 2 mmHg (3%). Among performance variables, maximal squat performance decreased by 29.5 kg (19%), maximal bench press performance decreased by 18.2 kg (16%), maximal deadlift decreased 31.7 kg (17%), and vertical jump distance decreased 13 cm (14%). The average daily dietary variables were as follows: average calories consumed =  $4000 \pm 463$  kcal/day; average calories expended from hiking and metabolic rate combined =  $5188 \pm 1197$  kcal/day; average daily caloric deficit =  $-1165 \pm 1070$  kcal/day; average carbohydrate intake =  $501 \pm 78$  g/day; average protein intake =  $143 \pm 19$  g/day; average fat intake =  $154 \pm 25$ g/day. The magnitude and duration of an extended backpacking trip can lead to a reduction in strength and power. A diet high in protein did not prevent the loss of lean body mass.