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Hypobaric Hypoxia Causes Body Weight Reduction in Obese Subjects

The reason for weight loss at high altitudes is largely unknown. To date, studies have been unable to differentiate between weight loss due to hypobaric hypoxia and that related to increased physical exercise. The aim of our study was to examine the effect of hypobaric hypoxia on body weight at high altitude in obese subjects. We investigated 20 male obese subjects (age 55.7 +/- 4.1 years, BMI 33.7 +/- 1.0 kg/m²). Body weight, waist circumference, basal metabolic rate (BMR), nutrition protocols, and objective activity parameters as well as metabolic and cardiovascular parameters, blood gas analysis, leptin, and ghrelin were determined at low altitude (LA) (Munich 530 m, D1), at the beginning and at the end of a 1-week stay at high altitude (2,650 m, D7 and D14) and 4 weeks after returning to LA (D42). Although daily pace counting remained stable at high altitude, at D14 and D42, participants weighed significantly less and had higher BMRs than at D1. Food intake was decreased at D7. Basal leptin levels increased significantly at high altitude despite the reduction in body weight. Diastolic blood pressure was significantly lower at D7, D14, and D42 compared to D1. This study shows that obese subjects lose weight at high altitudes. This may be due to a higher metabolic rate and reduced food intake. Interestingly, leptin levels rise in high altitude despite reduced body weight. Hypobaric hypoxia seems to play a major role, although the physiological mechanisms remain unclear. Weight loss at high altitudes was associated with clinically relevant improvements in diastolic blood pressure.