

# Effects of Resistance vs. Aerobic Training Combined With an 800 Calorie Liquid Diet on Lean Body Mass and Resting Metabolic Rate

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**Objective:** Utilization of very-low-calorie diets (VLCD) for weight loss results in loss of lean body weight (LBW) and a decrease in resting metabolic rate (RMR). The addition of aerobic exercise does not prevent this. The purpose of this study was to examine the effect of intensive, high volume resistance training combined with a VLCD on these parameters.

**Methods:** Twenty subjects (17 women, three men), mean age 38 years, were randomly assigned to either standard treatment control plus diet (C+D), n=10, or resistance exercise plus diet (R+D), n=10. Both groups consumed 800 kcal/day liquid formula diets for 12 weeks. The C+D group exercised 1 hour four times/week by walking, biking or stair climbing. The R+D group performed resistance training 3 days/week at 10 stations increasing from two sets of 8 to 15 repetitions to four sets of 8 to 15 repetitions by 12 weeks. Groups were similar at baseline with respect to weight, body composition, aerobic capacity, and resting metabolic rate.

**Results:** Maximum oxygen consumption (Max  $\dot{V}O_2$ ) increased significantly ( $p<0.05$ ) but equally in both groups. Body weight decreased significantly more ( $p<0.01$ ) in C+D than R+D. The C+D group lost a significant ( $p<0.05$ ) amount of LBW (51 to 47 kg). No decrease in LBW was observed in R+D. In addition, R+D had an increase ( $p<0.05$ ) in RMR  $O_2$  ml/kg/min (2.6 to 3.1). The 24 hour RMR decreased ( $p<0.05$ ) in the C+D group.

**Conclusion:** The addition of an intensive, high volume resistance training program resulted in preservation of LBW and RMR during weight loss with a VLCD.

**Key words:** resistance training, weight loss, resting metabolic rate, very-low-calorie diet, diet

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