

Exercise Attenuates Weight Gain and Fat Accumulation in CD1-Mice Consuming a High-Fat Diet

BRESLIN WL, STROHACKER K, CARPENTER KC, AGHA NH, LOWDER TW, and MCFARLIN BK.

Laboratory of Integrated Physiology, University of Houston; Houston, Texas

ABSTRACT

Background: Exercise training, in combination with a healthful diet, is a reliable method of weight loss or weight maintenance. It is unknown whether an exercise-training program would sufficiently attenuate weight gain during chronic consumption of a high-fat diet. **Purpose:** Therefore, the purpose of this study was to evaluate the ability of an aerobic exercise training program to prevent excessive weight gain both before and during consumption of a high-fat diet in CD-1 male mice. **Methods:** Mice were divided into four groups (N=10 mice/group): 4-weeks of treadmill running followed by 6-weeks sedentary (EX-SD), 4-weeks sedentary followed by 6 weeks of treadmill running (SD-EX), 10 weeks of treadmill running (EX), and 10 weeks sedentary (SD). After the first four weeks of the study, all groups began consumption of a high-fat diet to elicit a weight gain response. The exercise program consisted of 1 hour of treadmill running 5 days/wk at ~15m/min. Body weight and body composition were measured bi-weekly. **Results:** EX-SD, EX, and SD gained a significant amount of both body weight and body fat after only 4 weeks of high-fat feeding ($P<0.05$). SD-EX was the only group that did not gain a significant amount of body weight or body fat during the 6-week high-fat feeding period. **Conclusions:** The present study demonstrates the importance of exercise training in counteracting concurrent diet-induced weight gain, as seen in SED-EX. EX approximately matched SD in body weight gain and body fat accumulation, suggesting that exercise interventions must be progressive in order to prevent an adaptation to the training program that minimizes exercise benefits. Future research will evaluate progressive exercise training programs and their implications in various mouse models.

KEY WORDS: Mouse Model, Body Composition, Treadmill Running