Drive for Thinness, Energy Deficiency, and Menstrual Disturbances

Previous research has found strong correlations between subclinical disordered eating, drive-for-thinness (DT), and amenorrhea in exercising women. DT is characterized by a preoccupation with body weight and shape, fear of gaining weight, and high dietary cognitive restraint. A high DT score may serve as an indication of the development of the female athlete triad. The purpose of this study was twofold: to confirm that a high DT score provides indication of energy deficiency in exercising women and to compare the distribution of menstrual disturbances in exercising women with high versus normal DT. In this cross-sectional study, volunteers were grouped according to their DT scores, which were obtained from the Eating Disorder Inventory-2 (EDI-2). Of the 117 participants, 90 were categorized as normal DT (EDI-2 <7) and 27 as high DT (EDI-2 ≥7 or indication of a “fake profile”). Energy status was determined by measuring resting energy expenditure (REE) and confirmed by serum measurement of total triiodothyronine (TT3). Menstrual disturbances were evaluated by participants’ self-reported menstrual history and confirmed by the presence of a luteinizing hormone (LH) peak and measurement of daily urinary E1G and PdG. The results showed that women with high DT had significantly more cases of energy deficiency (P=0.024) and significantly more cases of severe menstrual disturbances (P=0.002).

Based on the results of this study, a high DT score is associated with energy deficiency and suppressed reproductive function and therefore may serve as an indication of energy and menstrual status in large groups of exercising women when laboratory assessment is unattainable. This study was funded by the U.S. Department of Defense, Army Medical Research and Material Command and National Athletic Training Association Foundation Grant.

Effects of Chocolate Milk Ingested After Exercise on Protein Synthesis

The ability to efficiently recover from strenuous endurance exercise is critical for optimal performance in both everyday training and competition. Ingestion of protein in the post-exercise period may help augment exercise-stimulated protein synthesis via activation of the mammalian target of rapamycin (mTOR) protein synthesis signaling pathway. The purpose of this study was to compare the effects of a carbohydrate-protein (CHO-PRO) supplement in the form of low-fat chocolate milk (CM), providing an average of 1.9g CHO, 0.6g PRO, and 0.3g fat per kg body weight (BW), with an isocaloric CHO beverage (2.5g CHO and 0.3g fat per kg BW) and a noncaloric placebo (PLA) on subsequent endurance exercise performance and mTOR pathway activation. Ten endurance-trained cyclists and triathletes (5 men, 5 women) cycled at a moderate pace (70% VO2max) for 90 minutes followed by 1-minute high-intensity intervals designed to deplete muscle glycogen levels. In randomized, double-blinded, placebo-controlled crossover fashion, participants were administered the experimental treatments immediately following and 2 hours post-exercise. After a 4-hour recovery period, during which muscle biopsies were collected, participants completed a 40-km time trial (TT). CM significantly improved TT performance compared with CHO and PLA supplementation (79.43min±2.11 vs. 85.74min±3.44 and 86.92min±3.28, P<0.05). Moreover, during the recovery period CM significantly increased activation of the mTOR pathway compared with CHO and PLA (P<0.05). These results suggest that post-exercise consumption of CM, an easily accessible and relatively inexpensive product, may be a practical, attractive strategy to improve performance and stimulate muscle protein synthesis for endurance athletes. This study was financially supported by a grant from the National Dairy Council and the National Fluid Milk Processor Promotion Board.

Leucine-Enriched Supplementation and Post-Exercise Muscle Protein Synthesis

Sustained endurance exercise results in reduced muscle protein synthesis, possibly due to elevated branched-chain amino acid (BCAA) oxidation. Ingestion of protein, specifically essential amino acids (EAA), during endurance exercise may enhance muscle protein synthesis by reducing the utilization of endogenous protein stores. The purpose of this single-blinded, randomized, crossover study was to examine the effects of ingestion of leucine-enriched essential amino acid (L-EAA) and isonitrogenous EAA supplementation during