

Bellissimo MP, Benardot D, Thompson W, and Nucci A. Relationship between within-day energy balance on body composition in professional cheerleaders. The FASEB Journal. 2017; 31(1): Supplement 795.2

Abstract: The purpose of this study was to assess the relationship between hourly and daily energy balance on body composition in professional cheerleaders on an active roster. Using a detailed hourly food intake and energy expenditure interview protocol, female professional cheerleaders (N=19) between ages 18–32 yr. (mean= 25.4 yr.) were assessed to obtain typical 24-hour training day energy intake and expenditure. Within-day (hourly) and daily energy balance and energy substrate values were obtained using NutriTiming™ as follows: Energy intake was predicted using USDA Food Composition Database SR26, and energy expenditure was predicted using Harris-Benedict plus a MET-Based relative intensity activity scale. Body composition was predicted using multi-current, 8-mode segmental bioelectrical impedance analysis (InBody 230, InBody USA). Data analysis found that dietary 24-hour energy intake was significantly below ($p < 0.001$) the unadjusted predicted energy requirement (mean intake= 1482 kcal vs. requirement= 2199 kcal), resulting in a negative 24-hour energy balance of -720 kcal. Daily carbohydrate intake was also significantly below (< 0.001) the recommended level (mean intake= 3.1 g/kg vs. requirement = 6–10 g/kg). Higher daily energy intakes (kcal/kg) were significantly associated with lower body fat % ($r = -0.55$; $p = 0.014$), higher lean body mass % ($r = 0.56$; $p = 0.015$), higher fat intake gm/kg ($r = -0.56$; $p = 0.014$), and more hours spent in an energy balance of ± 300 kcal ($p = 0.013$). Using a Mann-Whitney U-Test and the median of LBM% and BF% as the cut point, we found that participants with fewer hours in a negative energy balance had a lower body fat % ($p = 0.043$) and higher lean body mass % ($p = 0.035$). These data suggest that eating behaviors resulting in large energy balance deficits and/or more hours in a negative energy balance are counterproductive for achieving the desired lean body composition.