

Appl Physiol Nutr Metab. 2015 Sep;40(9):938-44. doi: 10.1139/apnm-2015-0023.

Body composition changes affect energy cost of running during 12 months of specific diet and training in amateur athletes.

Ghiani G^{1,1}, Marongiu E^{1,1}, Melis F^{1,1}, Angioni G^{1,1}, Sanna I^{1,1}, Loi A^{1,1}, Pusceddu M^{1,1}, Pinna V^{1,1}, Crisafulli A^{1,1}, Tocco F^{1,1}.

⊕ Author information

Abstract

Considering the relation between body weight composition and energy cost of running, we tested the hypothesis that by modifying body composition by means of a combined protocol of specific diet and training, the energy cost of motion (Cr) may be reduced. Forty-five healthy and normal-weight subjects were divided into 3 groups that performed a different treatment: the first group attended a dietary protocol (D), the second group participated in a running program (R), and the third group followed both the dietary and running protocols (R&D). Each subject underwent 3 anthropometric and exercise evaluation tests during 1 year (at entry (T0), month 6 (T6), and month 12 (T12)) to assess body composition and Cr adjustments. The mean fat mass (FM) values were reduced in R&D from 12.0 ± 4.0 to 10.4 ± 3.0 kg ($p < 0.05$ T0 vs. T12) and in the D group from 14.2 ± 5.8 to 11.6 ± 4.7 kg ($p < 0.05$ T0 vs. T12). Conversely, the mean fat free mass values increased in R&D (from 56.3 ± 8.8 to 58.3 ± 9.8 kg, $p < 0.05$ T0 vs. T12) and in the D group (from 50.6 ± 13.2 to 52.9 ± 13.6 kg, $p < 0.05$ T0 vs. T12). The mean Cr values of the 2 groups were significantly modified throughout the 1-year protocol (1.48 ± 0.16 and 1.40 ± 0.15 kcal·kg(-b)·km(-1) in the R&D group at T0 and T12, respectively; 1.83 ± 0.17 and 1.76 ± 0.23 kcal·kg(-b)·km(-1) in D group at T0 to T12, respectively). The R&D and D groups that underwent the diet protocol had a positive change in body composition during the year (FM/fat free mass ratio decline), which determined a Cr reduction.

KEYWORDS: body composition; composition corporelle; coût énergétique du mouvement; diet; diète; energy cost of motion; fat mass; free fat mass; masse adipeuse; masse maigre; programme de course; running program

PMID: 26307518 DOI: [10.1139/apnm-2015-0023](https://doi.org/10.1139/apnm-2015-0023)