**Original article**

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# PROTEIN, BODY FAT AND PROTEIN FAT INDEX (PFI): MODEL CHARACTERISTICS AND DIFFERENCES BETWEEN ATHLETES AND NON-ATHLETES OF BOTH GENDERS ESTIMATED USING MULTICHANNEL BIOELECTRIC IMPEDANCE

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The main objective of this research was to define the quantitative indicators for model characteristics and differences pertaining to body protein (Protein) structure as the basic component of contractile tissue, body fat mass (BFM) as the ballast tissue relevant to the basic motor skills and movement in humans, and protein fat index (PFI), a new index developed to define the relationship between ballast and contractile body tissues. The sample included 1,055 subjects (729 men and 326 women). The subjects were divided into subsamples according to types of sport, while the control groups were divided according to age and exercise levels. Body composition was estimated using InBody720, a segmental multichannel bioelectrical impedance analyzer.

The results revealed highly significant statistical differences between the variables relative to gender, men subsamples, and women subsamples (Wilks' Lambda = 0.403, p= 0.000; WL = 0.602, p = 0.000; WL = 0.427, p = 0.000, respectively). The difference between genders was most influenced by the Protein variable with 56.7%, followed by PFI with 21.9%, and least by BFM with 6.7%. In other words, the difference between men and women was 8.5 times higher in body protein mass, i.e. in basic contractile tissue, than in body fat mass, i.e. in ballast tissue. In men, the between-groups difference was most influenced by the BFM variable with 26.4%, followed by PFI with 18.8%, and least by Protein with 10.2%. In women, Protein and PFI accounted for 33.7% and 33.1% of the between-groups difference, respectively, while the effect of BFM was 25.1%.

Based on the results of this research, it can be argued that multichannel bioelectrical impedance, as a new method for body composition analysis, is discriminative and sensitive in measuring body protein and fat mass, and that PFI can be used as an integral indicator of the ratio between body protein and body fat components in scientific research and in practice, both in sports and in medicine.

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***Key words:*** *bioimpedance, body composition, athletes, protein fat index*