The results are as follows: 1. According to the calculated CSDs, men in 53 measurements substantially exceed women athletes, mostly in lengths dimensions and diameters. At the same time they are inferior in indicators of subcutaneous fat and the circumferences of the hips and buttocks. 2. The analysis of the CSDs for body mass components shows the large values of indicators of fat mass in women's bodies and, vice versa, active cell, bone and skeletal muscle mass in men, which is confirmed by the results of bioimpedance examination.

Key words: *freestyle wrestlers, body dimensions, body mass components, coefficient of sexual dimorphism*

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BIOLOGICAL BASIS OF MODERN HIGH PERFORMANCE SPORT

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Till now development of physical and psychological abilities in athletes was mainly provided by intensification of training process aimed at reaching maximal capacity in various body systems, in particular by maintaining high work capacity by means of doping accompanied by the out-of-limit expenditures of vitally important reserves of the organism. The difficult situation that we currently observe in sport science is formed by more and more evident contradictions between the already existing and the required knowledge about human organism on the one hand, and ways of achieving sport goals in young and adult athletes by means of physical work capacity stimulation pushing the limits of human capacities, on the other hand. This situation can be solved on the base of setting a new task in sport scientific researches. This task should be focused on "creating conditions for realization of near-maximal natural capacities of a human organism", rather than on "achieving a top result". The problem is to determine interdependency of joint development of the cellular, organismic, and social levels organized in a hierarchy. We think simulation modeling based on the informational approach to be a key method permitting to reveal time aspects of the evolution of joint work at those levels, provided mathematical means are adequate to biological laws. In this context special attention should be paid to the use of molecular computers, development of special complexes fitted with an interface for on-line control of processes, which take place in the athlete's organism at the cellular level. Hybrid systems of artificial intelligence permit to create models of voluntary movements control in athletes. The priorities of forming sport culture of an athlete can shift in three directions even today: firstly, enhancing nature-consistent character of pedagogical influence, that means bringing to conformity the content of physical and sport activity with natural laws of age development of motor functions of athletes; secondly, mastering high technologies of sport training from first steps to harmonious sport perfection of humans; thirdly, maximal approximation of the content and form of realization of sport training to those being individually acceptable for each athlete.

Key words: *sport, top athlete, models, sport training*

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