

Characteristics of the specialised nutrition of top women athletes

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by Sergej Portugalov

“ According to the author of this article there are three groups of specialized nutritional supplements which are most important regarding problems connected with female physiology: (1) lipotropic factors, (2) anabolizing agents, and (3) contraceptives. The problems of the specialized nutrition of women athletes can be solved by (1) increasing the muscle mass while decreasing the fat layer by making body fat oxidize itself through aerobic strength work, together with a relative deficit of carbohydrates and the stimulation of muscle protein synthesis with a complex of protein and amino acid substrate products, B group vitamins and anabolizing agents, and (2) by the regeneration of the functional state of the organism of a female athlete in the post-natal period and during breastfeeding (initial aerobic loads, carbohydrates deficit, lipotropic agents, organism cleansing, application of the aerobic strength bloc). ”

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Sexual dimorphism, and the physiological peculiarities of the female organism connected with it, determine many specific features, not only of the training process of top women athletes, but also of corresponding aspects of their nutrition and use of necessary nutritive supplements. These peculiarities include a lower haemoglobin content and the necessity to raise the Hb level in the first half of the menstrual cycle, the female type of muscle and body fat distribution, the increased share of the work carried out by the muscles while burning the fat layer, the prevention of unwanted pregnancy and the recovery in the post-natal period. Table 1 illustrates these specific features in more detail (according to YORDANSKAYA 1995 with modifications).

One of the most distinctive tendencies in women's athletics is the rapprochement of their biological indicators to similar parameters of men athletes. Analysis of the anthropometric indicators of men shot putters can serve as an example of this trend (ABRAMOVA and others 1994). It is this rapprochement of physiological indicators that explains the rapid progress made by women in many athletic events.

The specific details of specialized nutrition for athletes, taking into account the specifics of the female organism, are based on the pyramid type model (Figure 1). Only a rational combination of all three elements of the pyramid can provide the

Table 1: Sexual dimorphism of some morpho-functional characteristics of athletes (according to YORDANSKAYA 1995 with modifications)

Characteristics	Men	Women
Height	177.5	164.8
Weight	71.9	54.6
Muscle mass [kg/%]	38.96/54.2	28.99/53.1
Fat mass [kg/%]	6.40/8.9	5.57/10.2
Arterial pressure systolic [mmHg]	118-112	97-102
Arterial pressure diastolic [mmHg]	74-77	60-62
Blood [l]	5.6	4.3
Erythrocytes [$10^{12}/l$]	4.0-5.0	3.9-4.9
Haemoglobin [g/l]	130-160	120-140
Iron [mmol/l]	8-31	6-29
Creatinin [mmol/l]	61-115	53-97
Urea [mmol/l]	3.3-7.5	2.7-7.3
Testosterone [mmol/l]	9.0-38.3	<4.3

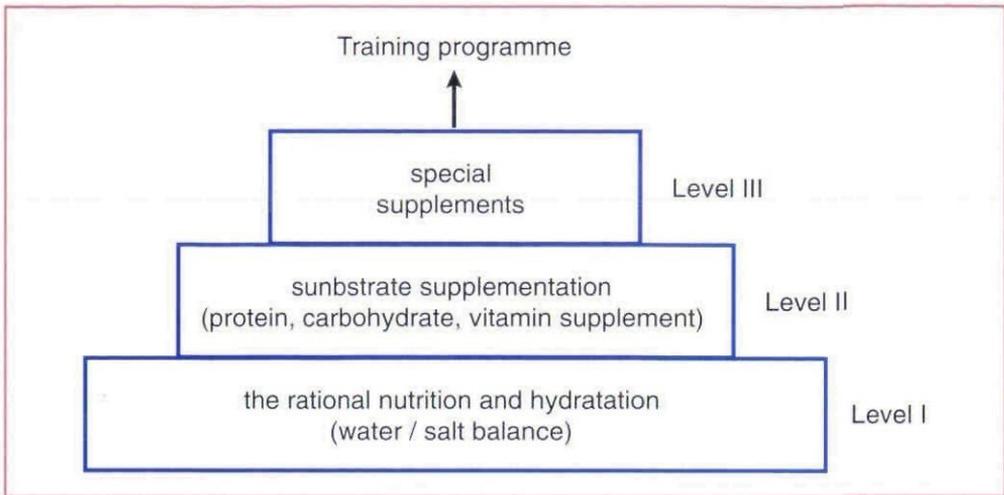


Figure 1: The pyramid of sport nutrition

most effective medical, biological support for the training of top athletes.

There has recently been a clarification of the terms used in the complex subject of sports nutrition. Sports nutrition is a kind of applied discipline at the junction of several sciences, such as physiology, biochemistry and pharmacology. At the *first level* of the pyramid we speak about nutritional components and major nutritional substances (proteins, fats, carbohydrates, vitamins and minerals). At the *second level* we use the term "substrate specialized products" (those high in protein, protein with added carbohydrates, protein-carbohydrates, crystallized amino acids, creatines). At the *third level* the term "specialized supplements" is most appropriate. The introduction of this term, instead of the previously used "preparations", indicates the natural basis of these supplements, which are not manufactured doping stimulators. The following groups of specialized nutritional supplements are most important regarding problems connected with female physiology:

- lipotropic factors (based on micro cellulose, enzymatic fat burners). Use of hypobulermic products of the narcotic analgesic group (phepranone type) is inadmissible;
- anabolyzing agents (ecdisterone -cf. Figure 2-, tribusponin, adaptogens such as leusea);
- contraceptives (progesteronic, oestrogenic, combined). In regard to the use of 19-NOR-ethisterone, doctor's consultations are compulsory, and any preparation containing it should be reported.

Some approaches to the solving of problems of women athletes' specialized nutrition

- (1) Increasing the muscle mass while decreasing the fat layer.
The solution to this problem is to make body fat oxidize itself through aerobic strength work, together with a relative deficit of carbohydrates and the stimulation of muscle protein synthesis with a complex of protein and amino acid substrate products, B group vitamins and anabolyzing agents, such as ecdisterone (the so-called "triad" method) – see Figure 3.
- (2) Regeneration of the functional state of the organism of a female athlete in the post-natal period and during breast feeding.

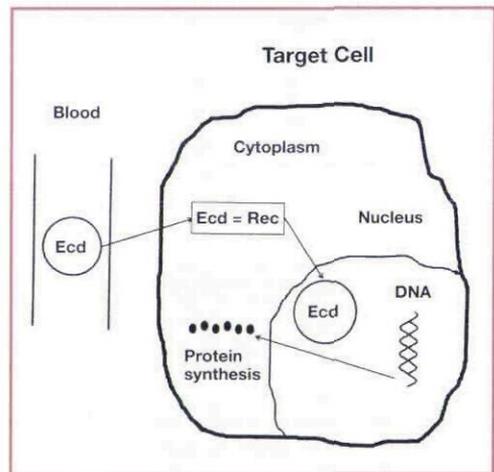


Figure 2: Mechanism of ecdisteron action on muscle

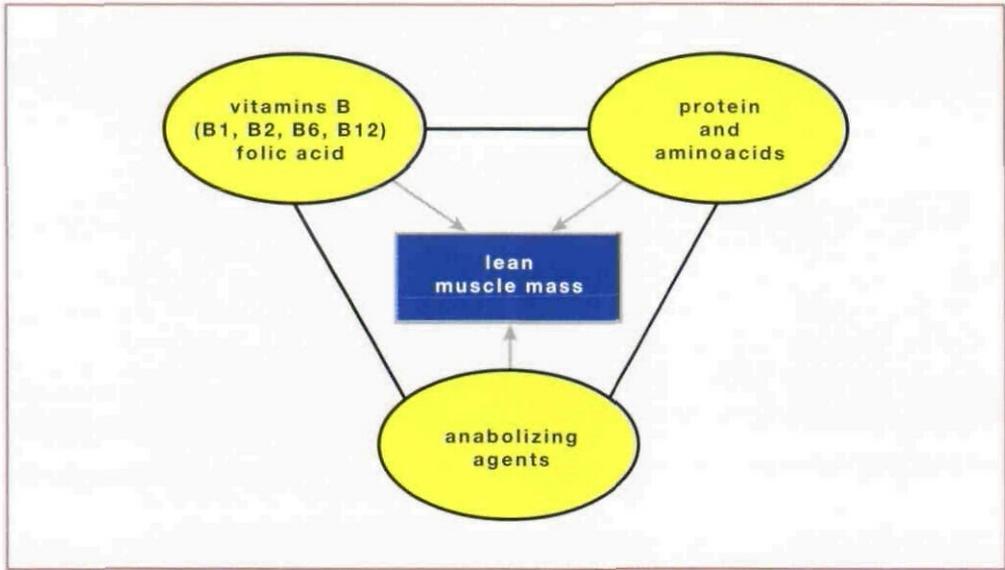


Figure 3: Stimulation/stabilization of lean muscle mass

Pregnancy, child birth and breast feeding cause a dramatic physiological, hormonal and psychological restructuring of a women athlete's organism, which is accompanied by a distinct lack of adaptation to physical loads. This lack of adaptation is manifested by a substantial growth of body mass, with the muscle mass decreasing drastically (by 100%) and the fat mass growing by the same amount.

Solution to the problem are:

- initial aerobic loads
- carbohydrates deficit, lipotropic agents
- organism cleansing
- aerobic strength bloc – see (1).

