

Sport, Ernährung und Immunität

Roman Khanferyan



Ernährungsregeln wurden (in Russland 2008) in verschiedenen Bevölkerungsgruppen aufgestellt. Zur gleichen Zeit

wurden aufgrund der spezifischen Körper-Aktivierung/-Bewegung im Sport individualisierte Standards für die Athleten – insbesondere bei Kindern und Jugendlichen – mit hoher Relevanz festgelegt. Des Weiteren sind tiefgreifende Studien nötig, um die Parameter für den anthropometrischen Status je-

weils überprüfen zu können sowie den Ernährungsstatus (insbesondere den Immunstatus) der Sportler verschiedener Qualifikationen und Sportarten. Hierfür sind effektive Messungen notwendig, um die Ernährungsweise insbesondere junger Athleten zu definieren. Überaus wichtig für junge Sportler ist hier auch die Entwicklung von Studien- und Lehrprogrammen auf dem Feld gesunder Ernährung und geeigneter nutritiver zum Beispiel nicht-allergener Produkte.

Schlüsselwörter: Ernährung, Sport, nutritive Produkte, nicht-allergene Produkte, Immunstatus

Abstract

Sport, Nutrition and Immunity

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It should be noted that the norms of nutrition of various population groups in Russia were approved in 2008.

At the same time, given the significant activation of the sports movement, the development of individualized food standards for athletes, primarily children and youth, has recently acquired high relevance. Further in-depth studies are needed to assess the status of anthropometric parameters, the nutritional status of athletes (especially the immune status) of various qualifications and sports specialization, which will offer effective measures to improve nutritional support for young athletes and sport reserves. Extremely topical is the development of effective educational programs, especially for young athletes in the field of healthy nutrition and rational use of specialized products for athletes like non-allergenic products.

Key words: Nutrition, sports, nutrition products, non-allergenic products, immune system

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To compensate for increased energy costs, restore efficiency and preserve the health of athletes, especially in endurance sport, it is necessary to supply the organism with an optimal quantity of basic macronutrients (proteins, carbohydrates, fats), as well as micronutrients – minerals and vitamins. At the same time, the actual consumption of macro- and micronutrients differs significantly from the recommendations for normal population. When calculating the diets in accordance to the physical load, many researches showed marked deviations in the consumption of basic nutrients and micronutrients. (Makarova et al. 2011, Rodriguez et al. 2009)

Nutrition is closely related to the functioning of the immune system, especially in extreme conditions, which are typical for high physical exertion. Along with macronutrients, micronutrients are very important in regulating the functions of the immune system: minerals (zinc, copper, chromium, iron, selenium, manganese, cobalt), practically all vitamins, especially antioxidants: (α -tocopherol, β -carotene) as well as vitamins of the group B, A, C, D. The need for micronutrients with increased physical exertion – especially extreme for optimal immune re-

sponse – is even higher than for growth and reproduction processes. There is a close connection between stress, immunity disorders and nutrition. Additional stressful effects violate many immunity functions and that means the risk to develop allergic diseases. Especially athletes with high immunoglobulin E (IgE)-level can suffer from anaphylactic responses and atopic diseases:

- high-fat diet suppresses many immunological functions;
- excess of carbohydrates reduces the supply of vitamins, especially the B complex,
- a number of factors contained in foodstuffs, modulate the neuronal, endocrine mechanisms of immunoregulation. In particular, caffeine affects immunity by activating the sympathetic nervous system,
- excessive consumption of alcohol suppresses many immunological processes;
- hydrogenated and partially hydrogenated products - trans-fatty acids activate free radical processes and damage immune and other cells;
- malnutrition and low calorie diet - factors of deficiency of essential amino acids, essential fatty acids, vitamins and minerals, which in itself contribute to immunodeficiency.

The consequences of malnutrition, the intake of macro- and micronutrients, lead to a decrease in the body weight of athletes, decrease in their physical activity, lethargy, drowsiness, chronic fatigue, soreness, frequent occurrence of infectious diseases of the gastrointestinal and respiratory tract, joint pains, muscular apparatus, decrease in working capacity and development of "overtraining syndrome".

Some foods can cause a state of stress, primarily immune-adaptive. In particular, the excess of sugar, caffeine, salt, food, depleted vitamins, minerals depresses resistance to stress and virtually all mechanisms of immunoregulation and the risk for allergic sensitization.

It is extremely important to monitor the structure of the body and other parameters for assessing the nutritional status. (Diel 2013) In particular, frequent monitoring of fat thickness can provide meaningful information about changes in fat stores, the study of the level of ketones in urine – a marker of inadequate carbohydrate intake, monitoring of muscle mass parameters for assessing the development of the state of muscle development, rapid fatigue and loss of form can be symptoms associated with inadequate nutrition. So, in the study of J.C. Gibson et al. (2011)

Schwerpunkt

33 soccer players were examined – aged 15.7 ± 0.7 years during a 4-day analysis of actual nutrition in the study of anthropometric indicators. It was found that the average sum of seven skin folds was 103.1 ± 35.2 mm, body mass index $- 22.7 \pm 2.7$. In the analysis it turned out that the average recommended energy consumption was 2079 ± 460 kcal/day, while the estimated energy consumption was 2546 ± 190 kcal/day. At the same time, the level of consumption of macronutrients was disrupted. Thus, 51.5% of athletes consumed less than 5g/kg of carbohydrates, 27.3% consumed less than 1.2g/kg of protein, 21.2% of athletes consumed less than 25% of fats. The level of consumption of micronutrients revealed many violations in the destruction of pantothenic acid (54.5% of the expected), folic acid (69.7%), calcium (66.7%); 89.3% and 50% of athletes had a deficiency in blood of iron and a metabolite of vitamin D (25-OH-vitamin D), respectively.

When analyzing the nutrition of athletes with carbohydrates, it is necessary to take into account the glycemic index (GI) of foods (food rating depending on the response of blood glucose to reference food). Examples of products with a high glycemic index (>85) are bagels, muffins, donuts, raisins, corn chips, ice cream, sports drinks, and with a lower glycemic index (<60) - yogurt, grapefruit / oranges, beans, nuts, apples / pears / plums, milk, brown rice, etc. It is known that compounds with high GI containing dextrose and maltose (e.g. carrots, raisins, corn flakes, bread, rice cakes) cause a significant increase in glucose. Products with low / moderate GI containing sucrose and lactose (yogurt, apples, dried fruits, beans) cause slight / moderate increase in the concentration of glucose. In addition to the study of the GI, it is important for the control and insulinemic index (ranking in the blood of food based on the response of insulin to the same reference food).

All sports, especially in running for long distances (marathon, 10 km), it is extremely important to control the water-electrolyte exchange. Dehydration can begin within 15-20 minutes after the start of running. Consumption of liquid cannot go in parallel with the rate of its absorption (maximum saturation speed is about 1 liter of liquid per hour). Even a loss of 1% of the fluid worsens the athlete's physical activity. Thirst may not appear until there is a 2% loss of fluid (about 1.3-1.4 liters for a person weighing 70

kg). Symptoms of dehydration are: thirst, dry mouth, weakness, fatigue, nausea, vomiting, fever, muscle cramps, dizziness, confusion, weak, fast heartbeat, impaired coordination.

In accordance to the recommendations of the dietary association of the USA, Canada and the American College of Sports Medicine (ADA et al. 2000): a duration of training less than 60 minutes, ordinary drinking water can be consumed. Sports drinks are used for the duration of the training process for more than 60 minutes. Before and during the run, you must take at least 400 ml of fluid 1-2 hours before the start of the run, take 200-300 ml of fluid every 15-20 minutes during running. After running, at least 400-700 ml of liquid is recommended for each kg of body weight loss. The fluid should be taken until the urine becomes clear or pale.

The FIFA Medical Committee is citing data on problems in the nutrition of soccer athletes (FIFA 2006):

- Insufficient awareness of proper nutrition, food and beverages
- Wrong choice of food products for their self-purchase or meals outside of fees
- Weak awareness (or virtually none) of specialized food products for athletes
- High workload in the training process, which does not allow to adequately accept the appropriate products
- Limited selection of good products
- Frequent travel
- Irrational, inadequate use of dietary supplements and specialized sports products, as well as misuse.

In conclusion, it should be noted that these problems are typical for almost all types of sports. It should be noted that the norms of nutrition of various population groups in Russia were approved in 2008. At the same time, given the significant activation of the sports movement, the development of individualized food standards for athletes, primarily children and youth, has recently acquired high relevance.



Food Pyramid: nutritional recommendations for athletic adults (© Schweizerische Gesellschaft für Ernährung SGE)

Further in-depth studies are needed to assess the status of anthropometric parameters, the nutritional status of athletes of various qualifications and sports specialization, which will offer effective measures to improve nutritional support for young athletes and sport reserves. Extremely topical is the development of effective educational programs, especially for young athletes in the field of healthy nutrition and rational use of specialized products for athletes like non-allergenic products.

Roman Khanferyan, MD, PhD

Peoples' Friendship University of Russia (RUDN), Moscow, Russia

Email: khanferyan_roman@yahoo.com

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Food Synergy

von Cindy Maréchal



Ein neuer Denkan-satz in der Ernäh-rungsfor-schung befasst sich mit synergeti-schen Wirkun-gen von Nah-rungsmit-

telinhaltstoffen. Der Begriff *food synergy* umfasst das Konzept der Nah-rungssynergie nach dem die im Lebens-mittel aufeinander abgestimmten In-haltstoffe in ihrer Gesamtheit additive und synergistische Effekte entfalten.

Die gesundheitsfördernden Eigenschaf-ten einer pflanzenbasierten, wenig ver-arbeiteten Kost beruhen nach diesem Konzept im Zusammenwirken der ein-zelnen Stoffe.

Der Fokus der menschlichen Ernährung liegt heutzutage zu stark auf den Vita-minen, Mineralstoffen und Spurenele-menten. Die Bedeutung der über 8.000 bisher bekannten sekundären Pflanzen-stoffe wird jedoch immer noch in weiten Teilen unterschätzt. Inzwischen gilt als gesichert, dass isolierte einzelne Nähr-stoffe nicht dieselbe Wirkung entfalten können wie ein komplexes vollständiges Lebensmittel.

Die Wechselwirkungen zwischen den einzelnen Nahrungsbestandteilen sind signifikant. Diese Signifikanz ist aller-dings abhängig von ihrer biologischen Aktivität und ihrer Verstoffwechslung im menschlichen Körper.

Food Synergy bedeutet, dass sich einzel-ne Bestandteile wie Vitamine oder sek-undäre Pflanzenstoffe in unserer Nah-rung gegenseitig synergistisch ergänzen und verstärken und sie so erst ihr volles Potential ausschöpfen können.

Schlüsselwörter: synergistischer Effekt - sekundäre Pflanzenstoffe - Wechselwirkungen

Dipl. oec. troph. (FH)
Cindy Maréchal
Sandwall 52
25938 Wyk/Föhr

Abstract

Food Synergy
Cindy Maréchal

A new approach to nutrition research is concerned with synergistic effects of food ingredients. The term "food synergy" encompasses the concept of food synergy, according to which the ingredients, which are coordinated in the food, develop additive and synergistic effects in their entirety.

The health-promoting properties of a plant-based, low-processed diet are based on this concept in the interaction of the individual substances.

Human nutrition today is widely focused on vitamins, minerals and trace elements. However, the importance of more than 8,000 previously known phytochemicals is still largely underestimated. Meanwhile, it is well established that isolated nutrients do not have the same effect as a complex complete food.

The interactions between individual food components are significant. However, this significance depends on its biological activity and its metabolism in the human body.

Food synergy means that individual ingredients in our diet, such as vitamins or phytochemicals, complement and intensify each other synergistically; thus they can exhibit their full potential.

Keywords: synergistic effect – phytochemicals – interaction

Sportlernahrung: Industriell hergestellte Kalo-rien- und Nährstoffbomben

Andreas Steneberg

Hierzulande herrscht eine große Bandbreite zwischen Bewegungsmuffeln und hyperaktiven FitnessfanatikerInnen. Während die Einen sitzend mit Chipstü-ten und Cola vor dem Bildschirm hocken, unterliegen Andere dem Gesundheits-wahn und verleiben sich Energy-Drinks und -Gels, Powerriegel und isotonische Lösungen ein, die ihnen Flügel verleihen sollen. Von beiden Extremen profitiert die Nahrungsmittelindustrie, die maßge-rechte Fastfood-Lösungen anbietet und erfolgreich vermarktet.

Reicht die bewährte, regional und öko-logisch hergestellte Vollwerternährung

nicht mehr aus, um den Körper fit zu halten und Krankheiten vorzubeugen? Müssen zur Regeneration nach sportli-cher Betätigung/Belastung Nährstoffver-luste durch spezielle Präparate ausgegli-chen werden? Ist ein Verzicht auf Grundnahrungsmittel wie Milch, Getrei-de oder Fleisch zur Steigerung des Leis-tungspotenzials sinnvoll? In diesem Beitrag sollen Sinn und -losigkeit von Spezialnahrungen, Diäten und Aufbau-präparaten für Stubenhocker, Hobby- und SpitzensportlerInnen vor- und zur Diskussion gestellt werden.

Schlüsselwörter: Sport, Spezialnahrung, Nahrungsergänzungsmittel, Regeneration, Gesundheitsbewusstsein

Abstract

Special nutrition for athletes: Industrial-ly produced calorie and nutrient bombs
Andreas Steneberg



In affluent societies, there is a wide range between "couch potatoes" and hyperactive fitness fanatics. On the one hand, people are sitting in

front of the screen with a chip bag and cola, others are inferior to health mania and incorporate energy drinks and gels, power bars and isotonic solutions to give them wings. Food industry benefits from both extremes by offering optimized fast-food solutions and successful marketing.

Is the proven, balanced diet of organic and whole foods, not adequate to keep the body fit and prevent illnesses? Do we need special preparations for regeneration after exercise, to compensate the loss of nutrients? How useful is the abandon-ment of staple foods such as milk, grain or meat for increasing the performance potential? In this lecture, the sense and senselessness of special foods, diets and nutritional supplements for homebodies, hobby and top athletes will be presented and discussed.

Keywords: sports, special food, nutritional supplements, regeneration, health awareness

Dipl. oec. troph.
Andreas Steneberg
Walter-Jost-Str. 20
58638 Iserlohn