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Sports Nutrition

Sporternährung

EDITORIAL

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The medically-applauded increasing number of people who are regularly active in sports and also participate in organized competitions has led among other things to interest among sports participants in questions of special nutrition in sports.

Nowadays the importance of balanced nutrition in achieving athletic performance is unquestioned. However, numerous different opinions have existed and still exist about the "right" nutrition to cover the needs of sports-active people.

Carbohydrates & Proteins

For many years in the past, sports nutrition was considered under the aspect of sufficient protein intake and a steak before a competition was the top nutritional component for increasing performance. In the 1980s, the Scandinavian group led by Bengt Saltin published the results of studies on the importance of muscular glycogen stores for the development of muscular performance, placing carbohydrates in the focus of scientific interest. Carbohydrates in all variations were consumed in endurance sports sometimes even to excess. This development was undoubtedly promoted by an increasing general interest in questions of sports nutrition. Stimulated by the increased popularity of large general sport endurance events, like city marathons, cycling or triathlon competitions, more and more people began to intensively discuss questions of performance optimization by means of special nutrition.

Meanwhile, the importance of carbohydrates for endurance athletes is unfortunately regarded here and there with more reserve. Caused by the increasing spread of "low carb" diets for weight management, more and more athletes – especially endurance athletes – hit on the idea of treating what they consider their overweight with low-carbohydrate nutrition, often with fatal results for performance development.

The assessment of the importance of proteins has also changed over time: until the 1980s, up to 4g/kg body weight was the maximum recommended daily protein intake, whereas now targeted intake of selected amino acids is the method of choice for providing optimal protein supply. Meanwhile, it has also been understood that endurance athletes need not only carbohydrates, but definitely also have anincreased protein requirement: More proteins are needed for anabolic processes of muscular regeneration like the synthesis of mitochondria, and even if endogenic muscle protein is metabolized to maintain a minimal blood sugar level in frequent exercise phases in a glycogen-depleted state, there is an increased protein requirement.

Micronutrients

In addition to the importance of macronutrients, the role of micronutrients has also become apparent. Adequate supply with electrolytes, like potassium, iron and magnesium, is essential for optimal development of performance: an adequate intake is considered prerequisite for top performance. The effects of selenium, manganese, chrome, molybdenum and other substances have also been thoroughly examined.

In the vitamin group, various substances have been recommended or rejected with shifting focus; under the motto "a lot helps a lot" not only unphysiological megadoses are found on the market. Again and again, substances are declared to be indispensable and possibly meaningful for athletes' balanced nutrition, if only they theoretically can influence biochemical processes at any point in biochemical pathways and thus lead to improved energy supply. But in many cases, founded scientific data are lacking.

The importance of plant substances in medicine was long pooh-poohed by "hard-core" science as mysticism or charlatanism. Since the large pharmaceutical companies began operating their own research laboratories in the Amazonian rain forests to isolate and examine such substances, there has also been a change in our assessment of phytotherapy. The same applies to sports nutrition, where impressive data on the mode of action of certain plant substances on the influence of physical performance capacity were published in recent years, including well-demonstrable mechanisms of action using also genetic procedures. Discussions will likely soon arise as to the whether plant substances, such as those in traditional Chinese medicine which act via activation of certain genes, constitute doping.

Nutritional Supplements

The importance of special nutritional components quickly led to the marketing of these substances in the form of nutritional supplements for athletes. The market for these products has meanwhile reached a volume in the billions. In addition to the "classical" macrosubstances in the form of a wide variety ›

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of protein and carbohydrate products, the market is flooded with innumerable vitamin and micronutrient substances. The scientific proof of efficacy of many of the offered substances on performance enhancement is often questionable: many of these preparations are also contaminated with banned substances and could cause great problems for athletes under the doping control system.

Reservation in taking nutritional supplements is certainly advisable, whether they are in fact generally superfluous is a matter of controversy: there is substantial proof that all substrates needed by the body can be obtained in adequate quantities in a balanced and well-planned diet. The knowledge that fluid and nutrition intake immediately after exercise enables better and quicker regeneration speaks in favor of nutritional supplement preparations, at least for macronutrients. This alone gives rise for practical reasons to the necessity for taking nutritional supplements, since it is highly unlikely that someone will prepare his fried egg with mashed potato in the swimming pool or on the field. For this reason, they are definitely of value, if not perhaps even indispensable, for the quickest possible refilling of nutrient stores and rapid start of anabolic regeneration processes.

Study Results

Looking closely at the results of various studies on the effects of certain substances on physical performance capacity, it soon becomes clear that these results are very diverse and sometimes even diametrically opposed. These differences are especially evident in examining the efficiency of micronutrients on selected performance parameters. And if it is not assumed that these differing results depend on the interests of the sponsors who finance such studies, two further mechanisms must be taken into consideration in assessing nutritional supplements.

In estimating the effects of enhanced nutrition, the importance of individual examination of the various effects of identical substances on different people becomes again quickly apparent. As we must finally admit – something which is absolutely nothing new for many experienced trainers – there are totally different reactions to identical training stimuli in various persons and rigid training regimens are often counterproductive. We also have to realize that the individual reaction to certain nutrients can be very different. Optimal protein intake before or after strength training can be very different in various individuals, because the optimal time of intake may differ. Drinking behavior can also be individually divergent: there is no doubt, that an adequate fluid intake is very important during long-lasting exercise; nonetheless, world-class athletes surprise us again and again by not drinking at all, for example during a marathon.

The "Placebo" Factor

Moreover, the "placebo" factor should not be underestimated in assessing such study results on presumed performance-enhancing effects. We all know patients or persons in our circle of friends and acquaintances, who convincingly claim that they regularly feel especially well after taking a certain nutritional supplement. Even though scientific studies on such substances do not bring any unequivocal proof, such experiences still have to be included somehow in the assessment. Over the past few years, placebo research has delivered an amazing explanation of which mechanisms are behind this phenomenon: according to this explanation, the phenomenon, which has been known for decades, is triggered by various psychosocial and environmental factors. Among these are initially the consumer's anticipation of what effect can be expected, and also the ways and means, how and by whom the mode of action of a preparation is presented. Via complex neurobiological reactions, these psychological factors trigger peripheral physiological mechanisms, including the release of endogenously-produced substances, which in turn lead to subjective mood improvement and thus can explain the elevated performance.

In this issue, various aspects of the nutritional requirements in sports are presented by outstanding specialists and experts in sports nutrition working in various teams in the German-speaking region. I hope you will enjoy reading the issue and find many ideas for activities in the day-to-day practice of nutrition advice.

Note

Literature is available from the author on request.