

Biomarkers of Nutrition, Metabolic Health and Food Allergies of Athletes: A Review

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Abstract

Aim: The aim of this review was to discuss the role of biomarkers of nutrition, metabolic health and food allergies of athletes. **Results:** The research in the field of nutrition, metabolic health and food allergies has identified various biomarkers for assessing athlete's nutrition status metabolic health and performance. However, there are biomarkers which changes in individual's participating in physical activity and exercise training programs. In the present review an approach was to review the current literature of nutrition, food allergies and determined a set of validated biomarkers of nutrition and metabolic health of athletes that could be used by coaches and trainers. **Conclusion:** The present review will help sport scientists, coaches, trainers, clinical sport professionals, researchers, and athletes to better understand how to monitor biomarkers of nutrition, metabolic health and food allergies of athletes, as they can better evaluate performance, modify training and identify nutritional deficiencies that elicit maximal improvements in athlete's performance.

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Introduction

The performance of an athlete and his/her recovery from exercise is improved by optimal nutrition according to a joint position stand by the American College of Sports Medicine (ACSM), Dietitians of Canada and the American Dietetic Association (ADA). When nutritional intake is insufficient functional performance of athlete is impaired and a high incidence of disordered eating in athletes, in particular female athletes contributes to concerns about general health. Specific dietary or nutritional deficiencies are very common in athletes particularly for iron and vitamin D for which studies have reported deficiency rates of 73% (Constantini et. al., 2010) and 22-31% (in female athletes) (Dubnov and Constantini 2004; Risser et. al., 1988). Other, less common nutritional deficiencies in nutrients such as folate, vitamin B12, or magnesium may result in reduced endurance work performance and muscle function in athletes. Individual nutritional requirements of athletes depend largely on type of sport activities and training specific bioenergetics demands as well as on an athlete's metabolic tolerance, needs and preferences. Frequent monitoring of nutrients (macronutrient and micronutrient) intake in athletes may help recognize individual deficiencies and track changes, especially as training volume and nutritional demands increase. Nutritional measurement by objective biomarker testing eliminates partiality associated with more traditional and subjective nutritional assessments (e.g. three day recall method, questionnaire).

Glucose, Fat and Protein

Glucose functions as the principal energy source in human body. Unlike fats and proteins (e.g., ketones), which the body uses them as energy sources in some circumstances, glucose is the only