Sports Nutrition: More Than Just Calories – Triggers for Adaptation
Nestlé Nutrition Institute Workshop Series

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Sports Nutrition: More Than Just Calories – Triggers for Adaptation

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Preface

Diet significantly affects athletic performance, and serious athletes recognize that adoption of a dietary strategy that meets their nutrition goals will maximize the possibility of competitive success. These goals, however, will vary between sports, at different times of the training and competition program, and between individuals.

The practice of sports nutrition has evolved over the years and has become increasingly complex. At one time, the focus was on achieving a high protein intake, especially a high intake of animal protein. This idea is intuitively attractive as it is easy to believe that a high intake of protein will support the building and repair of muscle proteins. In the latter part of the last century, the focus shifted. It was recognized that an adequate intake of protein is essential for all athletes, but the role of carbohydrate, especially muscle glycogen, and water became the focus of sports nutrition strategies. This reflected the recognition of the importance of carbohydrate availability and hydration status for performance in endurance performance in the laboratory. Ensuring a high dietary carbohydrate intake in training was encouraged for all athletes to allow consistent intensive training without the risk of chronic fatigue, illness and injury.

There is now a growing recognition that the primary role of sports nutrition may be to promote the adaptations taking place in muscle and other tissues in response to the training stimulus. There seems little point in training hard without taking advantages of the opportunities that nutrition support can offer. There is emerging evidence that the ingestion of relatively small amounts of protein, and more particularly of the essential amino acids present in proteins, before, during or soon after training can stimulate muscle protein synthesis, and that these effects may accumulate to amplify adaptations to training. Not all athletes want an increase in muscle mass, but remodeling of the muscle protein composition is as important for the endurance athlete as it is for the strength and power athlete. For athletes in sports with a high technical component, sound nutritional strategies may allow gains in strength and endurance with a smaller training stimulus, allowing more time to be devoted to the refinement of skills and technique.
There is also much interest in the implications of manipulation of the fat and carbohydrate content of the diet. It is well established that an adequate availability of endogenous carbohydrate stores is essential for performance, but it is also clear that nutrition strategies that spare carbohydrate use by increasing the oxidation of fat can enhance performance in events where carbohydrate is limiting. Various nutritional strategies that promote the capacity of the muscle to oxidize fat have been identified. Whether these can be adopted by athletes to enhance performance is less clear at the present time.

The aim of this workshop was to explore the effects of nutritional manipulations on the metabolic responses to acute and chronic exercise and to further identify the possible role of these dietary interventions in promoting adaptive changes in muscle, adipose tissues and other potential sites of limitation to exercise performance.

Ronald J. Maughan
Louise M. Burke
Foreword

Nutrition is central to a healthy active lifestyle. In fact, research has shown that physical activity, at the correct intensity and duration, not only improves the quality of life, it decreases the incidence of disease, chronic health conditions and obesity. For athletes, from elite active competitors to those who enjoy pushing themselves physically, diet has an important role to play in contributing to sporting success and activity goal achievements.

Life in the world of sport revolves around training and competition. To be able to healthfully sustain training, as well as strive for performance improvements, be it skill, power, strength, speed or endurance, recovery between training sessions is essential. Informed dietary choices help ensure fuel needs are met to promote adaptations to training, to facilitate a quick recovery to enable training to be continued and intensified, and to ensure good health. This workshop has explored the role of sports nutrition beyond mere calories to fuel training and competition, to its effect on triggering adaptive changes within the body.

The workshop, held in Kona, Hawaii, USA, in October 2010, brought together an exceptional group of scientific experts, all specialists in different areas of sports nutrition from around the world who contributed enormously to the lively and intense discussions. We are extremely grateful for their tenacity and energetic participation before, during and afterwards in helping make this workshop such a success.

Our special thanks go to the excellent chairpersons, Prof. Louise Burke from Australia and Prof. Ronald Maughan from the UK, highly respected experts in the field of sports nutrition and the practical application of dietary strategies for elite athletes, for putting together and facilitating this outstanding scientific program.

This publication includes all the presented scientific papers covering the three macronutrients: carbohydrate, fat and protein, plus an additional chapter on water, together with their accompanying discussions. For the first time, the discussion section of the Nestlé Nutrition Institute Workshop Series has changed its format. From now on, the discussion is compiled by an invited expert in the field. The concluding chapter summarizes the ways in which the
technical scientific content from the workshop can be implemented as practical nutritional recommendations for athletes.

Quality of calories matter, and this ‘quality’ consideration is a particularly casing point for all athletes, whatever their level and whatever their goal, as revealed by the knowledge embedded within this book. Through the cooperation of the chairpersons with the Nestlé Nutrition Institute, an independent non-profit organization that fosters ‘science for better nutrition’, the proceedings of this Nestlé Nutrition Institute’s Performance Nutrition Workshop will hopefully provide a useful contribution to the evolving science in the area of sports nutrition.

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