International Journal of Sport Nutrition and Exercise Metabolism, 2003, **13**, 549-552

The IOC Consensus on Sports Nutrition 2003: New Guidelines for Nutrition for Athletes

Louise M. Burke

Early in 2003, the Medical Commission of the International Olympic Committee formed a Nutrition Working Group, consisting of Profs. Ron Maughan and Ed Coyle, Dr. Victor Matsudo, and this author. Twelve years had passed since the IOC had sponsored a meeting on sports nutrition and released its first consensus statement on nutrition for athletes. One of the first activities for the Nutrition Working Group was to update this official position statement, by means of a consensus meeting on sports nutrition, held in Lausanne, Switzerland, June 16–18, 2003. This activity was interesting both for its outcome—*How much has changed in our knowledge of sports nutrition since 1991?*—and its process—*How do we reach a consensus on a range of issues from the large group of scientists and practitioners who are vitally interested in them?*

The process occurred by dividing sports nutrition into 10 broad topic areas and then inviting researchers who had made key contributions to the literature on these topics, especially over the last decade to participate in the consensus meeting. Specifically, each was invited to prepare a fully referenced chapter, summarizing the latest knowledge on the areas within their topic, with particular attention to research undertaken since the 1991 meeting and ways in which knowledge and practice had changed compared to the information expressed in the first IOC consensus statement. Each author was asked to finish the review with a series of guidelines promoting "World's Best Practice" based on this latest knowledge. Next, a group of people representing both research and practice in sports nutrition was chosen to lead a discussion or rebuttal of each of these chapters. Effort was made to include people from a range of professions (e.g., research, sports medicine, clinical nutrition practice) and from different regions around the world so that a true range of opinions could be represented. The chapters were circulated to the whole group during May and, finally, all participants (see Appendix A) were brought together at the IOC headquarters in Lausanne to spend 2.5 days deliberating the consensus. Other key people to join the group were Dr. Patrick Schamasch, IOC Medical Director, and elite Namibian sprinter Frankie Fredericks, representing the IOC Athletes Commission.

The first 2 days of the consensus conference were spent on an in-depth discussion of each of the topics, with each author being asked to make a formal presentation of key points (30 mins), before handing over to their discussants to

L.M. Burke is with the Department of Sports Nutrition at the Australian Institute of Sport, Canberra, and the School of Health Sciences, Deakin University, Melbourne.

host a detailed, and often lively, debate on issues raised in the chapter (60 min). Towards the end of the discussion, the total group was asked to consider a list of practical guidelines raised for each topic, with strategies divided into guidelines for, guidelines against, and equivocal guidelines. On most occasions, common ground was found, and the wording of the guidelines was "smoothed" so that intentions and recommendations were clear. In a few cases, it was not possible to completely resolve the differences of opinion about how current knowledge should be put into practice. Some discussants felt that they needed to contribute a separate commentary to focus attention on an especially complex area. On the last half day of the meeting, the group was asked to prepare a 1-page consensus statement, which integrated all the information discussed over the previous days to provide an overview of the main principles of eating for optimal performance. This proved to be a difficult and time-consuming exercise, as we fought over wording, meanings, and positioning of ideas. However, with a noon deadline looming, we finally managed to get the hang of the task and fit all the important words on a single page. This document was uploaded to the IOC Web site <www.olympic.org> within an hour of the completion of the consensus meeting, in a display of the perceived importance of the information.

The outcome of the process is three-fold

- The 1-page Consensus Statement (see Appendix B), to provide a political tool to draw attention to the 2003 Conference and to the release of new nutrition information on sports nutrition.
- The publication of the full manuscripts from the Consensus Conference, as a supplement to the *Journal of Sports Science* in December 2003. (There are also plans to make these chapters available to a wider audience, perhaps via the IOC Web site and with a published book.)
- A booklet targeted at athletes and coaches, containing a summary of the guidelines for each area of sports nutrition and providing practical information on how these guidelines apply to various categories of sports and how they can be achieved in real life and with specific eating patterns and food choices. This booklet is currently being formatted for potential publication in a variety of languages with world-wide distribution.

Despite a tight timeline, this project has achieved a number of valuable outcomes, including resources that we hope will allow athletes, coaches, sports scientists, and sports nutritionists to update their knowledge and practice of sports nutrition.

Appendix A

IOC Consensus Conference on Sports Nutrition: Speakers and Discussants

1. **Energy Balance and Body Composition in Sports and Exercise**
   Author: Ann Loucks (exercise physiologist, USA)
   Discussants: Victor Matsudo (sports physician, South America and Nutrition Working Group member);
   Demetrios Chasiotis (exercise physiologist, Greece)
2. **Carbohydrates and Fat for Training and Recovery**
   Author: Louise Burke (sports dietitian, Australia)
   Discussants: Bente Kiens (exercise physiologist, Denmark);
   John Ivy (exercise physiologist, USA)
3. **Carbohydrates and Fat for Competition Preparation and Performance**
   Author: Mark Hargreaves (exercise physiologist, Australia)
   Discussants: John Hawley (exercise physiologist, Australia);
   Asker Jeukendrup (exercise physiologist, United Kingdom)
4. **Fluid and Fuel Intake During Exercise**
   Author: Ed Coyle (exercise physiologist, USA and Nutrition Working Group member)
   Discussants: Jose Gonzalez Alonso (exercise physiologist, Denmark);
   Clyde Williams (exercise physiologist, United Kingdom)
5. **Fluid and Electrolyte Needs for Training, Competition Preparation, and Recovery**
   Author: Susan Shirreffs (exercise physiologist, United Kingdom)
   Discussants: Sam Cheuvront (exercise physiologist, USA);
   Lawrence Armstrong (exercise physiologist, USA)
6. **Protein and Amino Acids**
   Author: Kevin Tipton (exercise physiologist, USA)
   Discussants: Bob Wolfe (exercise physiologist, USA);
   Joe Millward (protein nutritionist, United Kingdom)
7. **Vitamins, Minerals and Antioxidants**
   Author: Scott Powers (exercise physiologist, USA)
   Discussants: Louise Burke (sports dietitian, Australia);
   Zeyi Yang (China)
8. **Dietary Supplements**
   Author: Ron Maughan (exercise physiologist, United Kingdom)
   Discussants: Doug King (exercise physiologist, USA);
   Trevor Lea (sports dietitian, United Kingdom)
9. **Exercise, Nutrition and Immune Function**
   Author: Mike Gleeson (exercise physiologist, United Kingdom)
   Discussants: David Nieman (exercise physiologist, USA);
   Ron Maughan (exercise physiologist, United Kingdom)
10. **Nutritional Strategies to Influence Adaptations to Training**
    Author: Lawrence Spriet (exercise physiologist, Canada)
    Discussants: Marty Gibala (exercise physiologist, Canada);
    Jacques Decombaz (exercise physiologist, Switzerland)

Appendix B

IOC Consensus Statement on Sports Nutrition 2003

The amount, composition, and timing of food intake can profoundly affect sports performance. Good nutritional practices will help athletes train hard, recover hard, and adapt more effectively with less risk of illness and injury. Athletes should adopt specific nutritional strategies before and during competition to help maximize performance. Athletes will benefit from the guidance of a qualified sports nutrition professional who can provide advice on their individual energy and nutrient needs and also help them to develop sport-specific nutritional strategies for training, competition and recovery.

A diet that provides adequate energy from the consumption of a wide range of commonly available foods can meet the carbohydrate, protein, fat and micronutrient requirements of training and competition. The right diet will help athletes achieve an optimum body size and body composition to achieve greater success in their sport. When athletes restrict their food intake, they risk nutrient deficiency that will impair both their health and their performance. Careful selection of nutrient-dense foods is especially important when energy intake is restricted to reduce body mass and/or fat mass. Fat is an important nutrient and the diet should contain adequate amounts of fats.

Athletes should aim to achieve carbohydrate intakes that meet the fuel requirements of their training programs and also adequately replace their carbohydrate stores during recovery between training sessions and competition. This can be achieved when athletes eat carbohydrate-rich snacks and meals that also provide a good source of protein and other nutrients. A varied diet that also meets energy needs will generally provide protein in excess of requirements. Muscle mass is maintained or increased at these protein intakes, and the timing of eating carbohydrate and protein may affect the training adaptation.

A high carbohydrate diet in the days before competition will help enhance performance, particularly when exercise lasts longer than about 60 minutes. Dehydration impairs performance in most events, and athletes should be well hydrated before exercise. Sufficient fluid should be consumed during exercise to limit dehydration to less than about 2% of body mass. During prolonged exercise the fluid should contain carbohydrate. Sodium should be included when sweat losses are high especially if exercise lasts more than about 2 hours. Athletes should not drink so much that they gain weight during exercise. During recovery from exercise, rehydration should include replacement of both water and salts lost in sweat.

Athletes are cautioned against the indiscriminate use of dietary supplements. Supplements that provide essential nutrients may be of help where food intake or food choices are restricted, but this approach to achieving adequate nutrient intake is normally only a short term option. The use of supplements does not compensate for poor food choices and an inadequate diet. Athletes contemplating the use of supplements and sports foods should consider their efficacy, their cost, the risk to health and performance, and the potential for a positive doping test.

Excessive training and competition are associated with some negative consequences. Robust immunity and reduced risk of infection can be achieved by consuming a varied diet adequate in energy and micronutrients, ensuring adequate sleep and limiting other life stresses. Attention to dietary intake of calcium and iron is important in athletes at risk of deficiency but use of large amounts of some micronutrients may be harmful. Female athletes with menstrual disorders should be promptly referred to a qualified specialist physician for diagnosis and treatment.

Food can contribute not only to the enjoyment in life, but also to success in sport.