



Nutrition for Sports People



The aim of this Sportsheet is to provide a brief and straight forward guide for performers by outlining basic dietary requirements for sports people, and giving basic instructions on what, how much, and when to eat and drink.

The aim of any training session is to increase the demands (overload) on an athlete during their training session so that following a period of recovery, the processes of repair, growth and adaptation can occur to make that individual stronger and fitter for their event. In terms of high level sports people, the majority are able to train harder, recover faster, and adapt their bodies to the training stimulus. Diet plays a very important role in this cycle. A good diet can maximise an athlete's potential and support high training loads, conversely a poor diet has repeatedly been shown to have negative effects on training quality, recovery, and adaptation following training.

The Balanced Diet

All sports people require a balanced diet with an appropriate intake of carbohydrate, protein and fat (these nutrients are termed macronutrients). Historically, sedentary or athletic diets have expressed each of these as a percentage of the total calorific intake.

Example

	The Average Diet	Diet Recommended for Sports People
Carbohydrate	44-47%	55-70%
Protein	14-18%	15%
Fat	35-38%	30% or less

However, there are two limitations to this method. Firstly, it is relatively difficult to calculate the percentage of your diet coming from a particular source, (e.g. work out the number of calories coming from each of the macronutrients, and then incorporate that into the same workings for every food you have eaten that particular day). Secondly, even if the percentages of calories derived from these macronutrients are met, it does not necessarily mean that the sports person has eaten the same number of calories that they have used (energy balance).

The primary objective of the diet is to ensure sufficient calories are consumed to cater for the demand of all energy requiring activities throughout the whole day (resting energy expenditure + daily activities + training energy expenditure). In terms of calculating the calorific demand, the requirements are based upon the size of the individual, their occupation, and the duration and intensity of the specific training undertaken.

It is therefore outside the scope of this Sportsheet to list the calorific demand for all sports. The reader is guided towards the references given at the end of the sheet and specifically Reference 3 (McArdle, Katch and Katch - 1991) for comprehensive detail.

In terms of guidance for the sports person, the macronutrient guidelines are generally expressed relative to body weight. This allows the sports person to set targets to be met on a daily basis and is simply a case of addition. Table 1, later in this sheet shows the targets for nutrients (g) for sports people based on an individual's body mass.

The Balanced Diet

Carbohydrate intake

Carbohydrate provides energy for vigorous activity and is digested and absorbed more rapidly than the other macronutrients. Foods rich in carbohydrate build up the carbohydrate (glycogen) stores in the muscle and in the liver of the sports person.

Guidelines for carbohydrate intake:

10-12g per kg each day = 5-6 hours moderate intensity exercise, high total energy requirements.

7-10g per kg each day = maximise muscle carbohydrate stores, enhancement of daily training (1-3 hours), or to load prior to competition.

5-7g per kg each day = less than one hour moderate intensity exercise, aim to reach general nutritional goals.

Example

A 70 kg person who exercises (vigorously) on a daily basis daily should aim to consume:

70kg x 7g (to 10g) = 490 (to 700g) of carbohydrate per day.

Implications of inadequate carbohydrate intake

It is important to gain most of your calories from carbohydrate because in its absence, intensity cannot be maintained and premature fatigue occurs. It has also been documented that low carbohydrate intake increases the amount of energy derived from protein sources, so your body would potentially be breaking down some of the key enzymes, and muscle structures which you are actually trying to develop through training. Poor recovery and restricted growth also occurs with an inadequate carbohydrate intake and may lead to symptoms of the overtraining syndrome.

The athlete should understand that where intensity and duration are key determinants of preparation and performance:

- 1) **High carbohydrate intake allows you to train for longer, sustaining a higher exercise intensity**
- 2) **Longer / more intense training means a greater overload upon the body**
- 3) **Greater overload leads to enhanced adaptation**
- 4) **Enhanced adaptation makes you a fitter athlete**

Protein intake

One of the main parts of muscle is protein. It is therefore important to eat an adequate amount of protein daily in order to maintain muscle health and function. As a guide the sedentary individual should consume in the region of 0.83g per kg each day, whereas the sports person should consume between 1.3g and 1.8g per kg each day.

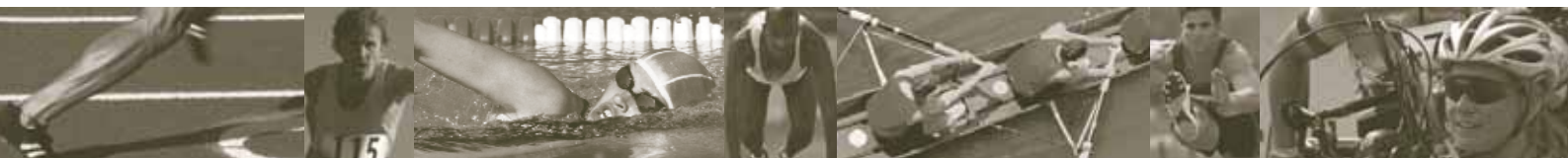
For accelerated recovery following training or competition, it is advised that the sports person consumes 0.5g per kg of protein in conjunction with a high carbohydrate snack within 20 minutes of the training session or event.

Implications of inadequate protein intake

Protein is not a stored nutrient and all protein exists in the human body in a functional form. Protein is involved in tissue building, and forms part of key enzymes and hormones that carry out functions at rest and during exercise. Protein is also a key component of antibodies that are associated with our protective immune system. Inadequate protein intake could potentially influence the functioning of any one of the roles of protein within the body potentially leading to decreased performance and illness.

Fat intake

For most sports people, foods high in fat, particularly saturated fat, should be avoided or, at the very most, eaten in moderation. If foods containing fat are consumed, the majority of the fat content should come from unsaturated fat. Dietary fat should never be totally excluded as it plays



an essential role in normal body function. As a guide, the sports person should aim to eat less than 1g per kg of fat each day.

Fluid intake

Losing as little as 2% of your body weight by dehydration can adversely affect performance and should that percentage rise to 5% there can be some very serious health implications. Dehydration reduces your blood volume, which leads to a rise in body temperature, and can lead to cramping and heat exhaustion.

- **Before training:** Drink plenty of fluid (1 litre per hour in the two hours prior to training).
- **During training:** Drink before you feel thirsty, thirst is a delayed response to dehydration.
- **Following training:** Fluid intake is vital for recovery, so 1 litre per hour following training is advised.

Sports drinks – Are they necessary?

Sports drinks are very useful for events/training that lasts greater than 30 minutes. Many of them contain carbohydrates (energy source) and electrolytes (salts that are lost in sweat). In events that are shorter than 30 minutes, no performance benefits have been noted, however, if the taste encourages you to drink more fluid then these drinks are going to help your training and recovery. Always experiment with different sports drinks in the weeks or months before competition to make sure they are right for you.

Preparing for activity

It has been documented that significant depletion of carbohydrate stores can occur over an 8-12 hour period where no eating occurs e.g. sleep. Consequently, it is of paramount importance that dietary intake prior to performance is adequate and appropriate. As a general rule, foods high in fat or protein should be avoided on the day of competition as these food types take longer to digest and remain in the digestive tract for longer. The timing of food intake is also important as increased stress or tension due to the impending competition can

significantly reduce blood flow to the digestive tract so delaying intestinal absorption.

Pre-activity meal

A light meal (300kcal or more) can be eaten 2-3 hours before an event to top-up muscle glycogen stores and suppress hunger during the activity.

- Eat mainly carbohydrates
- Avoid foods high in fat and fibre
- Drink plenty of fluid before the activity

For those individuals that find a pre-activity meal uncomfortable, a similarly balanced meal the night before the event can be consumed, then, a carbohydrate drink can be used to top up muscle glycogen stores.

During the activity

Drink regularly when participating in activity. It has been shown that drinking small amounts very frequently is more effective at preventing dehydration than large volumes of fluid taken infrequently.

After the activity

Consume carbohydrates soon after the event to aid recovery (0.5g per kg of protein is also advised). Drink more fluid to compensate for fluid loss during the activity.

A note of caution

The information presented in this sportsheet is meant as a general guide, and may prove unsuitable for certain people. Therefore, it is recommended that professional advice is sought to ensure that the suggestions will be safe and effective for you.

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Sports *sheet*



Table 1. General guidelines for calculating nutrient intake

Daily Exercise	Nutrient (g)	50 kg	60 kg	70 kg	80 kg	90 kg	100 kg	Body Mass (kg)
<1 hour moderate	Carbohydrate	250-350	300-420	350-490	400-560	450-630	500-700	
	Protein	65	78	91	104	117	130	
	Fat	<50	<60	<70	<80	<90	<100	
1-3 hours intensive	Carbohydrate	350-500	420-600	490-700	560-800	630-900	700-1000	
	Protein	75	90	105	120	135	150	
	Fat	<50	<60	<70	<80	<90	<100	
5-6 hours moderate intensity	Carbohydrate	500-600	600-720	700-840	800-960	900-1080	1000-1200	
	Protein	90	108	126	144	162	180	
	Fat	<50	<60	<70	<80	<90	<100	

Further Reading

Essentials of Sports Nutrition. Brouns, F. (2002). (2nd Ed) Chichester, UK. John Wiley & Sons.

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