LUCOZADE SPORT SCIENCE:
SPORTS NUTRITION: THE BASICS

KEY POINTS

- The most important aspect of the 'athletic' diet is energy intake, which should be derived from nutrient rich options of the key macro-nutrients carbohydrate, fat and protein.

- As the stores of carbohydrate within the body are not endless it is important that carbohydrate comprises 60-70 % (6-10 g/kgBM/day) of the diet.

- Protein should comprise approximately 15% of the total energy intake or practically speaking 1.2-1.7 g/kgBM/day (84-119 g for a 70 kg athlete).

- Fat is the most energy dense of the macro-nutrients providing 9 kcal per 1 gram, and should comprise the remainder of the diet (≤ 25%).

- Vitamins and minerals are complex organic and inorganic compounds respectively, which have an important function in the metabolism of carbohydrate, fat and protein.

- Fluid intake before, during and after exercise is important in the maintenance of hydration so crucial to the safe and efficient functioning of the body.

INTRODUCTION

Good nutrition practices help to fuel physical activity, in addition to sustaining normal bodily functions and the growth, development and repair of human body tissue. For those serious about their sport or exercise it is a well accepted concept that diet can significantly affect performance. In order to achieve the quality of your training and maximise adaptations, it is essential that you consume a diet that matches the demands placed upon the body.

The most important aspect of the 'athletic' diet is energy intake, which should be derived from a well balanced diet. How much an individual needs to eat varies considerably depending on age, gender, build, and energy expenditure. Typically sedentary adults require 1800-2800 kcal per day whilst those exercising may require up to 6000 kcal depending on the amount of 'work' completed. Energy intake is the product of the macro-nutrients within your diet; carbohydrate, fat and protein. Nutrient rich options of these macro-nutrients will ensure a suitable supply of vitamins and minerals (micro-nutrients). Fluid is also crucial to maintain hydration.

CARBOHYDRATE

Carbohydrate is an important source of energy for exercising muscle, providing approximately 4 kcal per 1 gram (g). Carbohydrate is stored as glycogen within the muscle and liver, and glucose within the blood, totalling ~ 2000 kcal of available energy. This is roughly enough energy for around 90 min of continuous exercise performed at a high intensity.

As the stores of carbohydrate within the body are limited carbohydrate should form the majority of an individual's energy intake. It is recommended that 60-70% of daily energy intake is carbohydrate, or more specific to body mass, approximately 6-10 grams of carbohydrate per kilogram body mass per day (g/kgBM/day; 420-700 g/day for a 70 kg athlete). This should be in the form of nutrient rich sources of carbohydrate (bread, cereals, pasta, starchy vegetables), whilst simple sugars (sports drinks, chocolate, sweets) should be consumed specifically before, during and after exercise as a readily available form of carbohydrate.

PROTEIN

Protein is a large molecule composed of one or more chains of amino acids, providing approximately 4 kcal per 1 g. Each protein has a unique function, although as a group they are fundamental in the structure, function and regulation of the body's cells, tissues and organs. The three key metabolic roles of protein are:

- Manufacture and repair of muscle tissue.
- Providing the building blocks for hormones and enzymes.
- Providing a small yet important amount of energy.

Protein should comprise ~ 15% of energy intake. Practically speaking this is 1.2-1.7 g/kgBM/day (84-119 g for a 70 kg individual). Endurance athletes fall at the lower end of this scale whilst strength and power based athletes fall at the higher end of the scale. This protein requirement is generally met through the normal diet, although specialist protein products may be useful in the periods immediately after exercise to help promote recovery. Good sources of protein include dairy products (cheese, milk and eggs), and meat, poultry, fish and nuts. It is important to remember that dairy products are high in fat and therefore low fat choices are advised.

FAT

Fat plays a significant role in insulation, protection and hormone regulation, in addition to providing a supply of fat soluble vitamins and essential fatty acids. Fat is the most energy dense and abundant macro-nutrient in the body, providing 9 kcal per 1 g and totalling 110,000 kcal of available energy. However, whilst fat is a significant energy source during low to moderate intensity exercise, as the intensity of exercise increases the proportion of energy derived from fat decreases. Consequently, fat in the diet should compromise no more than 25% of total energy intake, with less than 10% coming from saturated fat. Excess fat will lead to an increase in body fat which is known to reduce endurance, speed and power performance.

VITAMINS AND MINERALS

Vitamins and minerals are complex organic and inorganic compounds respectively, which are important in the metabolism of carbohydrate, fat and protein, in addition to aiding muscle, nerve and immune function. The most important micronutrients include; iron, zinc, calcium, and vitamins A, C, E, B6 and B12. Whilst exercise increases the needs for some vitamins and minerals, an individual's requirement is largely met by a well balanced diet.

Individuals at greatest risk of specific deficiencies are those following a restricted energy intake or those with a poor diet in terms of variety and/or general nutrient–rich food choices. A varied and balanced diet is largely based on vegetables, fruits, beans, legumes, grains, animal meats, oils and carbohydrate. The strong colours of many fruits and vegetables are a sign of a high content of various vitamins and minerals and other food antioxidants.

FLUID

Exercise results in the production of heat within the body, which unless removed, can lead to significant increases in body temperature. Sweating is the body's primary mechanism of heat loss. However, if the fluid lost as sweat is not replaced, then dehydration occurs and body temperature will increase anyway. As a result, the consumption of fluid before, during and after exercise is critical to the safe and effective functioning of the body.

Sweating is remarkably individual, being influenced by exercise intensity, duration, environmental conditions and the type of clothing/equipment worn. Furthermore, individual characteristics such as body weight, genetics, heat acclimatisation, and fitness will influence sweat rate for any given activity. Consequently, the variability in sweat rate between individuals emphasises that there is no single 'one size fits all' recommendation for fluid intake.