

NUTRITION

INTRODUCTION

Nutrition and exercise are connected; successful sports performance at any level depends on meeting day-to-day nutritional needs. For example, maintaining sufficient fluid and energy stores delays the onset of fatigue and enables students to participate in sessions longer before tiring. Additionally, although the stress of exercise stimulates physiological improvement, adaptations to physical stress actually occur in the recovery period following the exercise sessions. Therefore, rehydrating, refuelling and rest are essential components of the recovery process for any student.

Although basic advice on nutrition is similar for all sports participants, there are some important differences in various sports. This section introduces the fundamentals of nutrition and healthy eating and their effect on performance.

It is important that you understand the following terms:

- A balanced diet** Refers to the intake of appropriate types and adequate amounts of food and drink to supply nutrition and energy for the maintenance of body cells, tissues and organs, and to support normal growth and development.
- Healthy eating** Is based on the nutritional needs of the individual and includes a wide variety of foods. For example, carbohydrates provide energy, protein is needed for growth and development and fats provide a concentrated source of energy.
- Vitamins and minerals also play a key role in keeping our bodies healthy and free from diseases.
- Sports nutrition** Refers to eating a healthy balanced diet that is specific to your sport. Students who are exercising regularly need a diet that will support their physiological needs. A student who is participating in six hours or more a week of taekwondo (or other physical activity) will need more food than one who is participating for two to four hours a week.
- Insufficient energy and nutrient intakes may cause growth and maturation to be delayed. A student's diet should provide adequate energy and nutrients to support normal growth as well as the increased energy needs for participating in taekwondo sessions.

NUTRITION FOR AN ACTIVE LIFESTYLE

The energy needs of students vary depending on their age, size, physical activity level and gender. Therefore, it is crucial that their requirements are considered on an individual basis. All students will need a combination of *Go*, *Grow* and *Glow foods*.

Go Food

Go foods provide fuel to the body so it can participate in physical activity, such as Taekwondo. The *Go foods* you should be aware of are carbohydrates.

Carbohydrates

Digestible carbohydrates are mainly sugars and starch. Apples, oranges, potatoes, grains, sweets and bread are all carbohydrate-rich foods. Digestible carbohydrates break down mostly into glucose molecules. When used as energy, they become fuel for your muscles and brain.

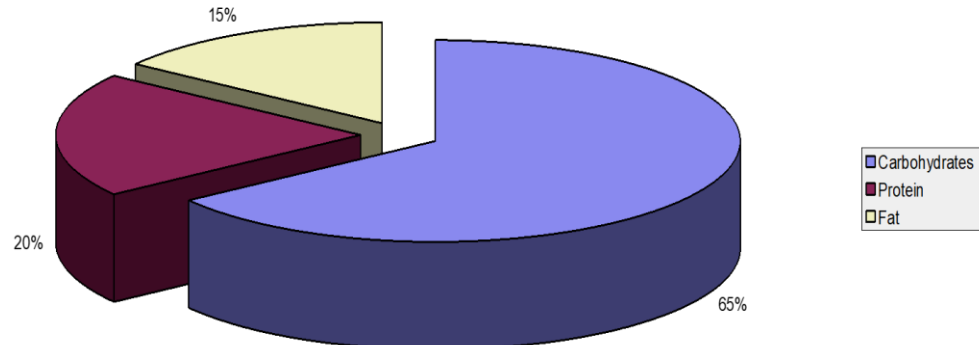
If your body does not have any use for the glucose, it is converted into *glycogen* and stored in the liver and muscles as an energy reserve. Your body can store about a half a day's supply of glycogen. If your body has more glucose than it can use as energy, or convert to glycogen for storage, the excess is converted to fat.

For students undergoing hard training, it is recommended their diet consists of 60-70% carbohydrate. Students undertaking less exercise need less carbohydrate (55-60%).

Carbohydrates are divided into two categories:

Simple carbohydrates Foods containing simple carbohydrates are sweet-tasting, like cookies, fruit, sugar, honey, sweets, and cake. Simple carbohydrates are already very close to being in the digested form, so they pass into your bloodstream quickly.

Complex carbohydrates These are found in foods prepared with grains and vegetables. Even though both simple and complex carbohydrates provide glucose, complex carbohydrates provide several nutritional advantages, such as additional vitamins, minerals, and fibre, which are necessary for good health and performance.



Daily macronutrient recommendation

Grow Food

Grow foods help the body to grow and develop and support it to cope with the demands of physical activity. The *Grow foods* you should be aware of are protein and fat.

Protein

Protein requirements are increased during exercise to support growth and muscle development. However, there is a limit to the amount of protein that the muscle can use. It is also important to have sufficient carbohydrate together with the protein, because this combination provides the necessary energy to fuel the muscle. Protein intake should make up 15-20% of the total energy consumed.

Fat

Fat supplies the body with essential fatty acids, such as linoleic acid, which are responsible for healthy growth and development. It is also a source of energy for physical activity. In addition, fatty acids are the basic ingredients for several hormones that help to maintain healthy skin and hair and transport fat-soluble vitamins (mainly A, D, E and K). Fat cells cushion organs and act as insulation against cold temperatures.

There are two general types of fat, *saturated* and *unsaturated*. The difference between the two is in their chemical make-up. The general rule is that unsaturated fats tend to be in liquid form at room temperature (e.g., olive oil, sunflower oil) and saturated fats tend to be solid at room temperature (e.g., butter, lard).

Students should consume two servings of oily fish per week, as it can help fight many diseases and keep the body healthy. Omega 3 fatty acids are found in oily fish, especially mackerel, salmon, halibut and herring. Other good sources of these acids are soya beans, flaxseed and green leafy vegetables.

Glow Food

Glow foods do not provide energy but contribute to health and well-being. You should be aware of *Glow foods* that contain micronutrients, such as vitamins and minerals.

Micronutrients

Vitamins and minerals are *micronutrients*, in that they are essential organic nutrients that do not provide energy but help release the energy from macronutrient sources. They are an essential part of a student's diet, as they act as agents to control cell metabolism and are components of body tissues. Vitamins are essential compounds that the body cannot make. They are classified as being soluble in fat or in water. The fat-soluble vitamins are A, D, E and K. The water-soluble vitamins are vitamin C and the eight B-complex vitamins (thiamine, riboflavin, niacin, vitamin B6, pantothenic acid, biotin, folate and vitamin B12). The A, C and E vitamins provide antioxidants which help minimise DOMS (Delayed

Onset Muscle Soreness). Both fat- and water-soluble vitamins are present in fruits and vegetables so students should be aiming to eat at least five portions of these food types every day. This can be achieved by having, for example, fruit in the morning, salad in a sandwich for lunch, a piece of fruit as a mid-afternoon snack and vegetables with an evening meal.

Iron, calcium and zinc are important minerals for students, especially if they are undergoing periods of hard training. Calcium requirements increase substantially during adolescence to meet the demands of bone growth and to achieve a good bone mass. Having strong bones is essential in a full contact sport to reduce risk of injury. Milk is a recommended source of calcium; young students consuming 1 pint of milk a day will meet two-thirds of their calcium requirements per day. It is also an excellent source of protein. Zinc is an essential mineral for growth, but the retention of it increases during growth spurts, leading to more efficient use of other dietary sources.

EATING BEFORE, DURING AND AFTER TAEKWONDO

What students eat and when they eat it will have a massive impact on their performance, strength and endurance. The following guidelines will explain the different requirements at each stage of exercise while Table 21 gives examples of appropriate foods for each stage:

Table 21: Examples of appropriate foods to eat before, during and after exercise

2-4hrs Before Exercise	During Exercise (>60mins)	Immediately After Exercise	1-2hrs After Exercise
Breakfast cereal with skimmed milk + banana Porridge made with skimmed milk + cinnamon + raisins Ham + salad + wholemeal roll + fruit 2 slices wholemeal bread + 1/2 tin baked beans + cheese	500ml sports drink 1 banana 1 cereal bar Flapjack Energy gels	500ml milkshake + banana 2 slices toast with peanut butter + honey 1 tin rice pudding + jam Fruit smoothie (300ml skimmed milk + handful strawberries + banana)	Beef chilli + wild rice Tuna pasta bake Spaghetti bolognaise Baked potato + baked beans + cheese 2 slices bread + tuna and sweetcorn mixed with low fat mayonnaise + rice pudding

FLUIDS AND HYDRATION

During Taekwondo training, the body loses fluid by two means: sweating and water vapour in the air that you breathe out. If this fluid is not replaced quickly, dehydration will follow. Dehydration has been shown to have an adverse effect on both exercise and health. As with food ingestion, there are guidelines to make sure sufficient fluid intake takes place at each stage of exercise:

Before Exercise	During Exercise	After Exercise
Water Fruit juice Squash (diluted)	Sports drinks (>60mins) Water Squash (diluted)	Sports drinks Fruit juice Squash (diluted)

N.B. Avoid carbonated drinks at all times before, during and after an exercise session

Sports Drinks

Sports drinks have been around for a few decades and are used by numerous athletes. They contain a mixture of electrolytes and carbohydrate in the form of glucose and sucrose, which help delay fatigue by topping up blood glucose levels and replacing lost fluid. However, it should be noted that *sports drinks only need to be used for intense exercise lasting more than 60 minutes.*

A word of caution

Most sports drinks have a low pH and fluids with a pH below 5.5 have the potential to damage the enamel on the outside of teeth. In order to minimise tooth enamel erosion

sports drinks should be consumed cold as this reduces the acidity. They should be swallowed quickly and not swished around the mouth and should be consumed by the mouthful rather than constantly sipping them in small amounts.

The recommended intake of sports drinks and other fluids is dependent on the intensity and duration of activities undertaken by students.

Recommended drinks for activities according to intensity and duration

Intensity and Duration	Type of Drink
Low/moderate/high <30mins	Water/diluted squash
Low/moderate <60mins	Water/diluted squash
High intensity <60mins	Sports drink
High Intensity >60mins	Sports drink

Taekwondo-specific Issues

1. It is a weight regulated sport
2. It is a full-contact combat sport

All students should be encouraged to follow the healthy eating guidelines, thus optimising their natural healthy weight.

Juniors and cadets should be encouraged to compete at their natural weight and not encouraged to diet to make a lower weight category.

When students need to lose weight they need to do so in the most appropriate and nutritious way, avoid laxatives at all costs and never dehydrate greater than 2% of body weight.

After the weigh in, students making weight need to re-fuel and re-hydrate immediately in a small but frequent process.

As a full contact sport, taekwondo students not only have the risk of sporting injuries but also have the full contact injury risk factor. To reduce the risk injury factor students should:

1. Have a good, healthy and balanced diet
2. Fuel properly for training
3. Have recovery nutrition
4. Have a good hydration status at all times

Source: British Taekwondo Coaching Resource - [Level 2 Certificate in Coaching Taekwondo Award Course](#).