

# **BRITISH CHILDREN'S SKI TEAM**

## **Nutrition for training and racing – Alpine Skiing**

### **Introduction**

The average UK diet consists of about 40% of calories from carbohydrate, 40% from fat and 20% from protein. This average diet is not ideal for anyone because of the health implications, but is especially unsuitable for a young athlete who is training hard.

Dietary intake of carbohydrate, fat and protein needs to be modified for athletes who are training on a regular basis, and should be further modified in the days preceding a competition. These notes attempt to cover the important points that should be considered when thinking about your diet during training and racing.

## **TRAINING DIET**

### ***The training diet should aim to:***

1. help you recover quickly from your previous training session
2. help you maintain an optimal weight
3. give you a balanced intake of nutritious foods and essential nutrients
4. taste good, because if you don't enjoy your food you will change it

The key to achieving all these goals is to eat a wide variety of foods. You don't have to stop eating all foods that are high in protein and fat to have a good high carbohydrate diet, you just have to cut down on those types of foods and emphasise the foods that are high in carbohydrate.

### ***Why do we want a high carbohydrate diet?***

Carbohydrate is the predominant fuel source when skiing, and performance will be reduced if you run out of carbohydrate. Many scientific studies have shown that dietary manipulation and carbohydrate feeding during exercise can improve performance. Fat is not a major fuel source during ski racing, it is used during more prolonged lower intensity work. Protein is used only minimally as a fuel in very prolonged exercise, where carbohydrate stores are depleted, and so is mainly important in a skier's diet for tissue growth and repair.

The muscle stores of carbohydrate (glycogen) can only sustain about 2 hours of activity when eating a moderate carbohydrate diet. The normal UK diet will not allow you to undertake this much exercise without additional food intake. Daily training will result in a gradual lowering of the muscle carbohydrate stores if the dietary carbohydrate intake is less than about 50% of total calorie intake.

### ***What foods are high in carbohydrate?***

There are two main types of carbohydrate – sugars and complex carbohydrates. Complex carbohydrate sources include cereals, bread, rice, pasta, potatoes, fruit, lentils and vegetables. Although some vegetables (lettuce, tomato, cucumber, beans) are good sources of essential vitamins, minerals and fibre, they are not high in carbohydrate, so these should be served along with a good source of carbohydrate. Sugar products like boiled sweets, honey and table sugar are good sources of carbohydrate, but provide no other nutrients. Sugary foods are good for refuelling during and after training to help restore muscle carbohydrate stores when lots of bulky complex carbohydrate cannot be eaten easily.

### ***Why do we need to reduce fat intake, and what is high in fat?***

Most UK diets contain about 40% of energy from fat. Not only does a high fat intake have health implications, but it also reduces the amount of energy intake from carbohydrate by slowing emptying of the stomach and absorption into the blood stream. Choose low fat products if possible (skimmed or semi-skimmed milk, reduced fat cheese) and remove all excess fat from meats and poultry prior to cooking. Cook using minimal oil, and try to grill instead of frying food. ***No chips/crisps/chocolate.*** Any meal with cheese or cream sauces like lasagne may be high in fat if reduced fat milk or cheese was not used in preparation. Beware of products indicating that they are ‘low-cholesterol’ or ‘light’ – neither of these mean that they are necessarily low in fat. Try to read the nutritional information on products and determine which are low in fat.

### ***What is the fluid requirement for athletes in training?***

The human body requires about 2 litres of fluid per day for normal functioning, even in an inactive person. An active person will require more than this depending on the climate, but the key point is that performance of an athlete will decline with a relatively small amount of dehydration.

- During exercise performed at 10-15degC you can lose as much as 1 litre of sweat per hour. If no fluid is taken in, this will result in a 1kg reduction in body weight from fluid loss alone.
- When the temperature is high or thermal stress is elevated by warm clothing, this fluid loss can exceed 2-3 litres per hour.
- Although skiing is performed in a cold or cool environment, the insulation of clothing can make the heat strain quite large.
- You will lose 0.5 litres per hour at high altitude, on the glacier.

To replace the fluid loss during exercise, you should aim to consume 1.5 times your fluid loss with an appropriate drink to restore your fluid level as quickly as possible.

Suggested drinks:

- Hot drinks (eg fruit tea with honey)
- Water (for low/medium intensity training up to an hour in duration) – best means of rehydration in young people
- Isotonic sports drinks (for high intensity work over a longer period) – may lead to dental problems, so you must have regular check-ups.
- Ribena with honey if you want to add some carbohydrate

Fluid can also be ingested in the diet by eating pasta or rice, both of which have high water content when cooked, but fluid must also be taken in. Sports drinks have the added advantage that they supply carbohydrate following training.

It is important to note that *you cannot learn to cope with dehydration*. A large loss of water is potentially life threatening. Running out of carbohydrate, on the other hand, just reduces your performance and eventually makes you unable to exercise.

### ***How do I eat all the carbohydrate I need?***

Eating a high carbohydrate diet can make your diet very bulky, and it may not be possible to eat all that you need in three meals a day. Athletes are advised to eat more frequently during the day, and have snacks between meals. However, be aware of your energy needs and don't overeat because you'll quickly put on excess weight.

### **Some examples of appropriate snacks are:**

Bananas, jam sandwiches, nuts and raisins, wine gums/jelly babies, and Jaffa cakes (low fat, high carbohydrate).

Your meals should fit round your training schedule so that you're not eating then immediately training. (Uphill transport usually takes care of that particular problem, particularly in Saas Fee!). You should eat 1-2 hours before training, have snacks to eat during training, and have a good break during the day to refuel.

*Muscle glycogen is best replaced 20-40minutes after exercise*, so take a snack with you to eat on the way down the hill.

You should aim to **eat a high carbohydrate meal within 1-2 hours following training** to maximise the rate of muscle glycogen refuelling. Sometimes you will find that your appetite may be suppressed, and in these cases you should drink a high carbohydrate beverage.

### ***The key points are:***

1. Eat what you need and not just what is available, and eat consistently.
2. Stick to a high carbohydrate diet.
3. Try to adopt a lower fat strategy.
4. Don't overeat when under stress or bored.
5. When you are growing and require extra energy intake, make this predominantly from a high carbohydrate source.
6. You don't need to take protein or vitamin supplements to gain muscle mass, increase weight or improve performance – plenty will be available in your diet already if you eat well.

## **PRE-RACE DIET**

*The pre-race diet should aim to:*

1. Boost your carbohydrate stores.
2. Ensure that you are adequately hydrated.
3. Ensure full recovery between 1<sup>st</sup> and 2<sup>nd</sup> runs.

To achieve these aims you will need to increase your percentage intake of carbohydrate 2-3 days prior to a race, as well as tapering your training sessions to ensure you are well prepared. Make sure you have plenty of fluids to drink in the days preceding a race, so that you are well hydrated.

*What should I do if competing regularly?*

If you have two or more races close together, try to fully hydrate between races (possibly with an isotonic sports drink), and eat a carbohydrate meal as soon as possible after each race. Do not eat a big meal less than 4 hours prior to a race or a light snack less than 1 hour before a race.

Make sure you have a light snack with you in case your race starts later than you expect. Most importantly, work out what works for you during training, as everyone will be different in their approach to eating before competition.

*How do I avoid dehydration?*

Keep drinks with you at all times before a race. Remember that thirst isn't a good indicator of dehydration, so drink small amounts frequently during the day if possible. Keep drinks cool – they taste better that way! Make sure you have enough fluid with you.

*How can I have a high carbohydrate diet when travelling to a competition?*

Canteen food may be tempting, but will generally be higher in fat than you want. If possible take food with you, but otherwise choose wisely! (eg pizza with thick base, not too much cheese; pasta - but *no* creamy or cheese sauce).

## **SPECIAL DIETARY NEEDS**

### ***Females and nutrition***

Female athletes tend to have more problems with nutrition, and tend to be more weight conscious than males. Poor nutrition which often occurs in an attempt to lose weight will affect not only your performance, but may have more general effects on your hormone balance.

Menstruating female athletes may find that their diet does not provide enough calcium or iron.

**Calcium** is essential for healthy teeth and bones, and is obtained mainly from dairy products. Low-fat dairy products are usually calcium-enriched, so calcium intake may be boosted without increasing dietary fat intake.

**Iron** is an essential component of the haemoglobin in the red blood cells that carry oxygen around the body. Any loss of iron (through menstruation or low iron intakes) may result in reduced oxygen carrying capacity, and will lead to poor performance. Iron intake can be increased by eating red meats (ferrous iron) and vegetable (ferric iron). Ferrous iron is absorbed more readily than ferric iron, which puts vegetarian athletes at greater risk of suffering from iron-deficiency anaemia. It is understandable then that vegetarian female athletes are most susceptible to iron deficiency. The inclusion of vitamin C rich products (fresh orange juice) in a meal can increase iron absorption and is useful for vegetarians to increase iron stores.

### ***Should I take dietary supplements to increase vitamin and mineral intake?***

There is no evidence for a beneficial effect of taking vitamin or mineral supplements if you have a well-balanced diet.

### **Highly recommended for further information:**

The Australian Institute of Sport website at [www.ais.org.au](http://www.ais.org.au)

- **Advice**
- **Information**
- **Recipes**