



When losing body weight, there is always the risk of also losing some muscle mass. However, this can partly be prevented by consuming relatively large amounts of carbohydrate. Because it is difficult to train hard when the energy intake is reduced, it is advised to achieve weight loss during the off season.



## Table Weigh loss tips

Determine a realistic body weight goal. The help of a sports dietician is likely to be needed if you identify a realistic target weight.

Do not try to lose more than 500 grams per week and do not restrict energy intake by more than 500–750 kcal per day.

Eat more fruit and vegetables.

Try to choose low-fat snacks.

Study food labels and try to find substitutes for high-fat foods. Do not only look at fat content but also the energy content per serving.

Limit fat add-ons such as sauces, sour cream and high-fat salad dressings or choose the lowfat versions of these products.

Try to structure your eating into 5 or six smaller meals.

Avoid eating very large meals.

Make sure carbohydrate intake is high and consume carbohydrates immediately after training.

Reduce the intake of fats and increase the intake of protein a little.

Increase the volume of aerobic training to promote fat oxidation. Ideally this exercise is performed daily for at least one hour at a fairly intensity: it should not be so hard that talking is a problem.

A multivitamin and mineral supplement may be useful during periods of energy restriction. You should seek the advice of a nutritionist or dietician.

Measure body weight daily and get measurements of body fat regularly (every 2 months) and keep a record of the changes.

*Many of these guidelines need specific nutrition knowledge and therefore athletes are encouraged to seek the advice of qualified registered sports dieticians.*

Sleep has been shown to decrease performance in a variety of exercise tasks. An increase in the number of errors is suggested in low-aerobic sports such as road cycling, while a decrease in decision making in moderate aerobic sports such as team sports has been reported. A decrease in power is evident in sports such as swimming and middle distance running and an increase in fatigue is observed in multiple anaerobic events such as jumping and weight lifting following sleep loss (Reilly and Edwards, 2007).

There is very limited scientific information on the role of dietary factors on the influence of sleep quality and quantity. Recent research however has suggested that high glycemic index meals ingested 4 hours prior to sleep decreases the time taken to fall asleep (Afaghi et al, 2007). Other recent research has also highlighted the benefits of protein ingestion (in the form of tryptophan) on sleep architecture.

Evidence also exists for changing sleep habits or sleep hygiene to induce sleep. Good sleep hygiene refers to behaviors, environmental conditions and other sleep-related factors that can be adjusted by an individual to enhance sleep (see table below). Increasing skin temperature has also been shown to enhance sleep, thus suggesting a role of hydrotherapy in improving sleep as well as enhancing recovery from exercise.

Enhancing sleep through appropriate nutrition and recovery may be one of the more effective methods of enhancing athletic performance. The tables below provide some simple advice on how this may be achieved.

## Factors Effecting Sleep

### Dietary interventions that may enhance sleep quality or quantity

1. Melatonin
2. Medicinal plants- Valerian
3. High Glycemic Index carbohydrate ingestion prior to sleep
4. Protein (tryptophan) ingestion prior to sleep

### Dietary interventions that may decrease sleep quality or quantity

1. Fasting
2. Caffeine intake
3. Alcohol intake

## Strategies to Enhance Sleep

### 1. Utilizing good sleep hygiene

- Maintaining a regular sleep-wake cycle (i.e. going to bed and getting up at the same time of the day)
- Use napping appropriately (naps should not interfere with nighttime sleep)
- Ensure bed is comfortable and the room temperature is appropriate (19–21 degrees C is often recommended)
- Avoid thinking, planning or other mental activities while in bed



## Sleep, nutrition and recovery

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Sleep is considered one of the best recovery strategies available to elite athletes. While the exact reasons we sleep are unclear, the benefits we experience in terms of recovery and regeneration are well acknowledged. There is now increased information available to athletes on increasing sleep quality and quantity through nutritional and other non-pharmacological means.



## 2. Breathing and relaxation techniques

## 3. Sensory withdrawal – dark, quiet environment

## 4. Warming the skin and/or cooling core body temperature

- Hot water immersion
- Hot/cold showers
- Other forms of hydrotherapy

## 5. Utilizing good recovery strategies to minimize pain and inflammation

- Appropriate recovery nutrition
- Hydrotherapy
- Stretching



### Suggested additional resources

1. Cole RC. Nonpharmacologic Techniques for Promoting Sleep. *Clinics in Sports Medicine*: 24 343-353, 2005.
2. Stepanski EJ, and Wyatt JK. Use of sleep hygiene in the treatment of insomnia. *Sleep Medicine Reviews* 7: 215-225, 2003.
3. Reilly T, and Edwards B. Altered sleep-wake cycles and physical performance in athletes. *Physiology & Behaviour* 90:274-284, 2007.
4. Afaghi A, O'Connor, H and Chow CM. High-glycemic-index carbohydrate meals shorten sleep onset. *American Journal of Clinical Nutrition* 85: 426-430, 2007.

# 10

## Dietary supplements

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Many athletes use a wide range of dietary supplements in ever-increasing dosages, but this may do more harm than good. Any athlete contemplating the use of any supplement should conduct a cost-benefit analysis. There is good evidence of potential benefits for a few supplements but for many, there is little or no proof of benefit or of safety. The limited regulation of the dietary supplements market has resulted in several possible risks. Some supplements do not contain ingredients listed on the label, or contain only small amounts (this applies especially to expensive ingredients). Some supplements are contaminated with microbial agents and other constituents (lead, broken glass etc) that may be harmful. Many of the supplements on sale may also be contaminated with substances that may lead to a positive doping test. Strict liability means that the player who tests positive as a result of ingestion of these supplements is still liable to suspension from the game.

Information available to coaches and athletes often comes from the suppliers of supplements, who have a strong interest in selling as much product as possible. Routine supplementation is not generally helpful, but the athlete with restricted energy intake or limited food choices may benefit from a low-dose broad

spectrum multi vitamin multi-mineral complex obtained from a reputable supplier. A few supplements that can offer benefits, but only if they are used at the appropriate time and in the right amounts.

Creatine use in sport remains controversial. Creatine is found in a normal meat-containing diet in amounts of about 1g/day, but supplementation usually involves about 10–20 g/d for a few days followed by about 2–3 g/d. Supplementation in these amounts can increase muscle creatine and creatine phosphate levels, and, although not all published studies show positive results, performance of strength tasks and short term high intensity exercise can be improved by supplementation. In particular, there are many reports of improvement when a few repeated short sprints with limited recovery are performed. The increase in lean body mass that often accompanies supplementation may be of benefit to some athletes.

Creatine supplementation can also promote glycogen storage, which can be important when rapid and effective recovery is needed after glycogen-depleting exercise. Caffeine can improve performance, in part by stimulation of fatty acid mobilisation and sparing of the body's limited carbohydrate stores, but also via effects on muscle and the brain. There may be improvements in performance of vigilance tasks and limited evidence of efficacy in tasks involving performance of skilled tasks. The effective dosage of caffeine is smaller than previously thought and benefits have been reported with doses as small as 1–2 mg/kg.

Bicarbonate acts as a buffer, and high doses of bicarbonate taken before events where large amounts of lactic acid are produced can help improve performance: in practice, this generally means events lasting from about 1–10 minutes.



More recently, there are promising results for supplementation with carnosine and β-alanine, which can increase the muscle content of carnosine, an important intracellular buffer: early results suggest this can be effective in improving performance in events where acidosis may be limiting. None of these products contravenes the current WADA regulations on doping in sports.

Supplementation is particularly prevalent among strength and power athletes, where an increase in muscle mass can benefit performance. Protein supplements have not been shown to be effective except in those rare cases where the dietary protein intake is inadequate, but intake of small amounts of proteins in the period just before or just after training may result in increased protein synthesis, which may help promote adaptations to training. These effects are achieved by essential amino acids alone, with the non-essential amino acids apparently having little effect. Other individual amino acids, especially lysine, ornithine, arginine and glutamine are also commonly used, but their use is not supported by well-documented evidence. Chromium and hydroxymethylbutyrate (HMB) are also used by strength athletes, but again there are no well-controlled studies to provide evidence of a beneficial effect.

Athletes use a wide variety of supplements aimed at improving or maintaining general health, and vitamin and mineral supplementation is widespread. Immune function may be compromised during periods of very heavy training and at times of stress. Many herbal and other products are used by athletes, as indeed they are used by the general population, to try to stimulate immune function, but most of these have not been well-researched, and athletes would be better advised to consume a sound diet that meets energy needs and contains a variety of foods.

In summary, the first step in nutrition support for athletes should be to identify individual nutrition goals and to ensure that a dietary strategy that will meet these needs is in place. Athletes and coaches must be cautious about supplement use. If it sounds too good to be true, it probably is.