

BRITISH SWIMMING WORLD CLASS PROGRAMME

FACT SHEET

Immune Function

Immune Nutrition

Athletes spend the majority of their week training and pushing the boundaries of physical exertion causing fatigue and tiredness. Long bouts of strenuous exercise (~1.5 hours) can cause a reduction in immune function, presenting real problems relating to the incidence and duration of illnesses and infections. In swimming, the risk can be exacerbated as the majority of training is completed in a hot and humid environment where bacteria and viruses can grow leading to a higher exposure to pathogens.

Time off to recover from illness reduces training time, impairs performance and adaptation and may prevent you from competing. Therefore it is important that you and your coach understand factors that can affect immune function and what nutritional strategies can be used to help maintain a healthy immune system.

What factors reduce immune function?

The following factors can directly depress the immune system and/or increase your susceptibility to illness:

- **Increased physiological stress** – caused by increased training load (intensity, volume and duration). This will increase the level of circulating stress hormones such as adrenaline, which suppress immune activity.
- **Increased psychological stress** – Also increases the level of stress hormones.
- **Reduced quality and quantity of sleep** – compromises your ability to recover in time for your next training session.
- **Inadequate recovery feedings** – After exercise the immune system can be depressed for up to 72 hours depending on the intensity and duration of training. Appropriate recovery feeding (protein and carbohydrate) will help offset the level of depression that occurs.

- **Dietary deficiencies** – these include protein, carbohydrate and fat (omega fatty acids), and micronutrients specifically zinc, magnesium, iron, selenium, copper, vitamins A, B, C, E and other antioxidant nutrients.
- **Exposure to pathogens** – Living and training in close proximity to other people will increase your exposure to pathogens. Small infections that are easily passed around will depress the immune system, increasing the risk of a more significant illness being contracted.

What can I do to maintain immune function?

Consuming a well balanced diet that is sufficient to meet your energy needs is the most important step to maintaining immune function. Carbohydrate, protein, appropriate sources of fat (e.g. omega fatty acids) and vitamins and minerals all play critical roles in maintaining immune function¹. Failing to consume enough energy for your volume of training or surprisingly eating in excess (e.g. increased carbohydrate intake at the expense of protein) can all have negative effects on your immune system.

Carbohydrate

Carbohydrate is a critical energy source for both muscle and immune cells, especially during exercise. Consuming **30-60g of carbohydrate per hour** in drinks or gels¹ during exercise can reduce the suppression of the immune system, as well as providing additional fuel for performance. The post-training period is critical for immune function. The immune system can be temporarily suppressed in the first few hours after prolonged, intense exercise, creating a window of opportunity for infection. Co-ingestion of carbohydrate and protein immediately after exercise should help replenish glucose and body-protein,

¹ Gleeson M (2006) Can Nutrition Limit Exercise-Induced Immunodepression? Nutrition Reviews, 65,3:119-131

BRITISH SWIMMING WORLD CLASS PROGRAMME

FACT SHEET

reducing the risk of infection². It is important that you fully replenish glycogen stores before your next session as training with inadequate carbohydrate and depleted glycogen can increase stress hormones and compromise your immune system. For more information refer to *The Basics. Carbohydrates and Competition & Training Recovery Nutrition* fact sheets.

Carbohydrate electrolyte sports drinks

- SIS Go Electrolyte
- Lucozade Isotonic Sport / Body Fuel
- Lucozade Caffeine Boost



Carbohydrate gels

- SIS Go Energy Gel
- Lucozade Body Fuel Energy Gel
- CNP Professional Pro Energy Gel



Protein

Inadequate protein intake can impair immune function by affecting the production of key immune cells, leading to an increased incidence of infection. Consuming an appropriate carbohydrate and protein recovery drink or snack immediately following training will help alleviate symptoms of inflammation and physiological stress that depress the immune system and help speed up recovery.

Suitable options are low fat flavoured milk, cereal and milk or specifically designed recovery drinks as below.

Recovery Drinks

- Lucozade Recovery
- SIS Rego Rapid
- For Goodness Shakes Sports Recovery Drink



Even more reasons to stay hydrated

Drinking fluids during exercise not only helps to prevent dehydration (which is associated with an increased stress response), but also helps maintain saliva flow rate, which would usually decrease during exercise and compromise your immune system. Saliva contains several proteins with antimicrobial properties (kill or limit growth of possible diseases) thereby protecting against infections³.

Nutritional interventions during illness

Despite best intentions and careful self management, most athletes will occasionally experience some illness. Most will usually be mild, with symptoms generally resolving in a few days. If symptoms persist for several days, a medical opinion should be sought. If you have cold and flu-like symptoms make sure you drink lots of fluids, especially hot liquids. Avoid nutrition stimulants such as caffeine, fizzy sugary drinks and high fat snacks, as they may temporarily make you feel better but they are likely to mask any symptoms, increasing the stress on your body and making you feel worse. Most of all you need to get plenty of rest!

Refer to *Prevention and Treatment of Common Infections* fact sheet for more information.

² Pyne D Nutrition for the athlete's immune system: eating to stay well during training & competition. In Burke LM & Deakin V. Clinical Sports Nutrition. Australia, The McGrae-Hill Companies, 2010:330-357.

³ Gleeson M, Nieman DC & Pedersen BK (2004) Exercise, Nutrition & Immune Function. Journal of Sports Sciences, 22,115-125.