CANADIAN SPORT CENTRE PACIFIC
PERFORMANCE POINT

Annamay Pierse, Swimming
2008 Olympian & World Record Holder
Photo: Kevin Bogetti-Smith

MINIMIZE ILLNESS TO *MAXIMIZE* PERFORMANCE

NUTRITIONAL STRATEGIES TO STAY HEALTHY & TRAIN TO YOUR FULL POTENTIAL

By Susan Boegman and Dana Lis, CSC Pacific Registered Dietitians

IMMUNE SUPPRESSION

The following factors may impact the strength of your immune system:

- **Heavy training**
  Each acute bout of heavy exertion leads to immune suppression (which can last 3 to 72 hours) and increased susceptibility to infections, especially upper respiratory tract infections (URTI). This is particularly due to exercises that affect stress hormones cortisol and adrenaline.
- **Exposure to new pathogens** (germs!)
- **Lack of sleep**
- **Stress**
- **Nutritional deficiencies and nutritional excess**
  Excessive intakes of polyunsaturated fatty acids, iron, zinc and vitamins A and E can also impair immunity and increase the risk of infection – so the "more is better" idea is not good approach.
- **Rapid weight loss**

YOUR IMMUNE SYSTEM

Defenses include:

- Physical barriers (skin, mucosal secretions)
- Chemical barriers (body pH)
- Phagocytic cells (neutrophils)

Even medically harmless infections can be detrimental to training and performance, so to work towards maintaining an effective immune system start with the foundation - a sound diet that contains a wide variety of foods.

Keep defenses healthy with a great nutrition foundation!

YOUR IMMUNE ENHANCING NUTRITION FOUNDATION

Stay Hydrated
Drinking fluids during exercise to prevent dehydration helps to maintains saliva excretion, which in turn contains proteins with antimicrobial properties. As well, dehydration also increases stress hormone levels that negatively impacts immune function. **Be sure to hydrate throughout the day and during training to maintain salivary secretions.**

Carbohydrates
Eat high quality grains, root vegetables and fruits at meals and snacks and consume 30–60 or more grams of carbs/hour during prolonged or intense exercise to lowers stress hormones. For daily carbohydrate recommendations see "Carbohydrate for Athletes Handout" **HERE**.

Exercise	Carbohydrate required
< 45 min	No carb required
1 hour	Optional – depends on rest of training schedule
> 2 hours low to moderate intensity	30 g carb/hour (most forms of carbs ok)
> 2 hours moderate to high intensity	Up to 60 g carb/hour (rapidly oxidized carbs, maltodextrin, glucose aka dextrose, sucrose, maltose, etc.)
Ironman, tour de France, long stage races	90-100g carb/hour * consult CSC Pacific dietitian

YOUR IMMUNE ENHANCING NUTRITION FOUNDATION

Protein

Moderate protein deficiencies may impair immune mechanisms. Athletes most at risk for sub-optimal protein intakes include vegetarians/vegans, athletes eating an unbalanced diet and those on food restriction for weight or fat loss. Consume protein at each meal and snack and in recovery after training or competition.

Strength athletes	1.4 – 1.7 g/kg body mass/day
Endurance athletes	1.2 – 1.6 g/kg body mass/day
Athletes aiming for fat loss	2.0g/kg

Vitamins and Minerals

Before turning to vitamin and mineral supplements, be sure to eat high quality food including 8 –10 servings of vegetables and fruit per day to prevent deficiencies.

Deficiencies in fat soluble vitamins A and E, and water soluble vitamins folic acid, B6, B12 and C and in the minerals zinc, iron, selenium, magnesium, manganese and copper can impair immune function and lower your resistance to infection.

Excess intake of some of these nutrients may compromise immunity and can be toxic. Consider a nutrition assessment before supplementing with more than a multivitamin.

Avoid Rapid Weigh Loss

Ensure you eat adequate protein and carbohydrates around training (before, during and after) and consider a vitamin and mineral supplement. If you are trying to reach a lower competition weight, achieve this ***gradually*** to avoid immune suppression.

SUMMARY OF NUTRITION SUPPLEMENTS

Numerous nutritional agents have been suggested to promote immune function. Some of these include Echinacea, glutamine, Vitamin E, Vitamin A, Zinc, B-glucan, probiotics, quercitin, and quercitin with EGCG. So far, only adequate carbohydrate supplementation during exercise, probiotics, quercitin, quercitin with EGCG, and zinc (for the common cold) have been shown to have a positive effect on immunity.

Omega-3 fatty acids	No benefit when dietary intake is adequate
Vitamin E	Supplements may be pro-oxidative. Obtain from food.
Vitamin C	Obtain from food or supplement up to 500mg/day as small effects on cortisol compared to carbohydrate.
Vitamin D	More research needed. Research is suggesting RDA needs to be increased. Take 1000 – 3000 IU October to April.
Zinc	Meta-analysis indicates 23mg zinc lozenges taken every 2 waking hours decreases cold duration by approx 40%
Glutamine	Not recommended. Body stores exceed exercise-lowering effects
Probiotics	Recommended. Improvements in some aspects of immunity + reduced respiratory and gastrointestinal problems.
Quercitin	Recommended. Reduction in illness rates during heavy training.
Quercitin with EGCG	Recommended. Strong anti-inflammatory response, with some anti-oxidant effect and improvement in innate immunity.

References: Jeukendrup, A. Sports Nutrition: From Lab to Kitchen.
Nieman, D, 2008. Immunonutrition for Athletes.
Gleeson, M. et al. 2005. Immune Function in Sport and Exercise.

ADDITIONAL STRATEGIES FOR ILLNESS PREVENTION

- Avoid sharing water bottles and utensils
- **Always** wash hands before eating and keep them away from mouth and nose
- Get 8+ hrs of sleep each night and rest days from training
- Minimize life stressors
- Avoid sick people and large crowds around competition times
- Regular medical monitoring
- Vaccinations as recommended by your sport physician

FOR MORE INFORMATION

Consult your *CSC Pacific Athlete Health & Performance Handbook*, or contact your CSC Pacific Registered Dietitian:

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