

PERFORMANCE NUTRITION

DECIPHERING THE LATEST SCIENTIFIC RESEARCH TO HELP YOU GET THE MOST FROM YOUR TRAINING, DIET AND SUPPLEMENTATION

BY MARK HOBDEN AND JAMES COLLINS

CHEERS! THE BENEFITS OF NON-ALCOHOLIC BEER

While moderate physical activity is beneficial to the immune system, prolonged and intense training periods place physiological stresses on the body, which can lead to increased inflammation and immune dysfunction. So there is considerable interest in finding dietary interventions that support the body during training and moderate the risk to the immune system. Somewhat surprisingly, one product that appears to provide such a benefit is non-alcoholic beer.

A study in the journal *Medicine & Science in Sports & Exercise* found that drinking 1-1.5 litres of non-alcoholic beer each day for three weeks before, and two weeks after the Munich marathon reduced post-race inflammation and incidence of upper respiratory tract infection.

Why would non-alcoholic beer have such an effect? The answer lies in the rich cocktail of phenolic compounds in beer, some of which have strong antioxidant, anti-inflammatory and antipathogenic properties.

MAIN FINDINGS

Consumption of non-alcoholic beer decreased levels of the pro-inflammatory marker interleukin-6 immediately after completing the marathon. Furthermore, total leukocyte (white blood cell) numbers were reduced by approximately 20% immediately post-marathon and up to 24 hours later in the non-alcoholic beer group

compared to the placebo group. Importantly, upper respiratory tract infection incidence was 3.25 times lower in the non-alcoholic beer group in the two weeks after the marathon.

SIGNIFICANT METHODOLOGY

A total of 277 healthy men were randomly assigned to consume either 1-1.5 litres of non-alcoholic beer or a placebo (containing no phenolic compounds) every day for three weeks before and two weeks after the Munich marathon. Blood samples were collected four weeks and one week before the race, immediately afterwards, and again 24 hours and 72 hours later. These were analysed for markers of inflammation and immune function (interleukin-6 and total blood leukocyte counts). The Wisconsin Upper Respiratory Symptom Survey was used to determine incidence of upper respiratory tract infection for the two weeks following the marathon.

TAKE-HOME MESSAGE

The daily consumption of two pints of non-alcoholic beer around the time of an intense and prolonged bout of exercise, such as running a marathon, appears to provide inflammatory and immune support, which could reduce susceptibility to respiratory illness. This is likely to be music to many people's ears but sadly the daily consumption of alcoholic beer is unlikely to have such a favourable effect. It is, in fact, more likely to lead to disturbed sleep quality and sleep

patterns and a decline in cognitive and physical function.

Some points to note:

- Competitors may wish to drink non-alcoholic beer around the time of major sporting events but its intake should be avoided immediately before, during and after training or competition.
- The antioxidants present in non-alcoholic beer may blunt physiological adaptations to training and, therefore, chronic consumption during the training cycle is not advised.
- The intake of non-alcoholic beer should supplement, rather than take precedence over, other recovery nutritional practices, such as the acute intake of carbohydrate, protein and fluid, which are the key to ensuring optimal glycogen storage, muscle protein synthesis and hydration.

REFERENCE

Scherr J, Nieman DC, Schuster T, Habermann J, Rank M, Braun S, Pressler A, Wolfarth B, Halle M (2012) **Nonalcoholic Beer Reduces Inflammation and Incidence of Respiratory Tract Illness.** *Medicine & Science in Sports & Exercise*, 44(1), 18-26



PHOTODISC

PRE-EXERCISE CORTISOL LEVELS WERE LOWER IN THOSE CONSUMING PROTEIN / LEUCINE SUPPLEMENTS

CAN LEUCINE HELP TO CLOSE THE "OPEN WINDOW TO INFECTION"?

A single intense bout of exercise may compromise immune function for anything between three and 72 hours. This weakening of the body's defences to invading pathogens (harmful micro-organisms) is often referred to as the "open window to infection". Furthermore, this situation may be exacerbated if additional training sessions are completed within this recovery stage.

There is increasing interest in the benefits of nutrient intake immediately after exercise. Many studies have focused on the immunoprotective properties of carbohydrate consumption during and after exercise but few have investigated the immunological effects of protein. Nevertheless, early evidence indicates that protein, and specifically the branched-chain amino acid leucine may support immune function after exercise.

A recent study at Massey University, New Zealand, investigated whether consuming a post-exercise protein supplement, rich in leucine, helps protect against post-exercise immunosuppression. Interestingly, they found that the intake of protein/leucine enhanced neutrophil activity following exercise when compared to a control supplement, indicating a level of immune support.

MAIN FINDINGS

By day six of the training block:

- Pre-exercise cortisol levels (a marker of physiological stress) were lower in those consuming the protein/leucine supplements.
- Acylcarnitine C16 levels were higher during exercise and neutrophil O2 levels higher after exercise, indicating improved neutrophil functioning following protein/leucine supplementation.

SIGNIFICANT METHODOLOGY

Twelve male cyclists took part in the study, which involved six days of high intensity training while following a standardised diet. After each training session, the cyclists consumed either a protein/leucine/carbohydrate/fat supplement (20/7.5/89/22 g per hour) or an isocaloric (same energy content) carbohydrate/fat (119/22 g per hour) control. Supplements were consumed for between one and three hours depending on the specific type of intermittent training session completed. On days 1, 2, 4 and 6 of the training period, blood samples were collected immediately before and after the training session.

TAKE-HOME MESSAGE

The study provides evidence that the consumption of protein/leucine after intense training may provide a level of immunoprotection through improved neutrophil functioning. Unfortunately,

as the study did not include a protein- or leucine-only supplement the benefits cannot be attributed to either one individually. Further studies are now required to confirm the immunoprotective properties of protein/leucine and to determine the impact of this nutritional intervention on incidence of illness in a large group of athletes.

The results from this new study are promising and further highlight the importance of protein/leucine intake following both aerobic and resistance exercise, which is already known to optimise muscle recovery and subsequent physiological adaptations. **M&F**

REFERENCE

Nelson AR, Jackson L, Clarke J, Stellingwerff T, Broadbent S, Rowlands DS (2013) **Effect of post-exercise protein-leucine feeding on neutrophil function, immunomodulatory plasma metabolites and cortisol during a 6-day block of intense cycling.** *European journal of applied physiology* [Epub ahead of print]

Performance Nutrition is a London-based consultancy that supports elite and recreational athletes. Director **James Collins** is a sport and exercise nutritionist and head nutritionist for Arsenal FC. For more information visit www.theperformancenutritionist.com

Mark Hobden is completing a doctorate in nutrition at the University of Reading and has degrees in sports biology and sport and exercise nutrition. He has also worked for the Gatorade Sports Science Institute, the Porsche human performance team at Silverstone and in professional rugby.