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Can training without sports fuel suppress your immune system? Taken from:

Bacurau et al (2002). **Carbohydrate supplementation during intense exercise and the immune system**. Clinical Nutrition, 21(5).

Regular exercise is good for the immune system, it strengthens your ability to fight illness and enhances general wellbeing. However, too much exercise or any other form of stress is known to have potentially detrimental effects on immune function, Bacurau et al (2002) carried out a study to examine the effects of hard cycling upon immune function and whether some of the effects could be offset by supplementing riders with carbohydrate drinks.

### What as the methodology?

Competitive male cyclists (12) completed 2 separate exercise trials, in both they were required to complete 6X20minutes of cycling (2 hrs total). They took 20 minutes recovery following each 20 minute cycling interval and the riders exercised at 90% of their anaerobic threshold.

The 2 trials were a week apart and during one of the trials they consumed carbohydrate drinks and on the other they consumed a placebo (flavoured water).

The researchers measured specific immune system indicators and other hormones in the blood stream, they also measured blood glucose and blood lactate.

### What were the results?

In the trial without carbohydrate drinks, the riders displayed lower levels of circulating blood glucose. This is to be expected as glucose is the main fuel used for exercise and there are limited stores (glycogen) in the muscles and liver.

The researchers also found lower levels of **GLUTAMINE**, which is a substance essential for effective functioning of specific immune system cells. Both glucose and glutamine remained stable during the trial when cyclists were given the carbohydrate drink.

Following the trial without carbohydrate drinks the riders also suffered a 2.23 fold increase in **CORTISOL** which is a well known stress hormone, there was no increase when riders were given the carbohydrate drink.

The researchers measured a substance referred to as **INTERLEUKIN-6**, this is a known indicator of inflammation in athletes and when the 2 trials were compared, Interleukin-6 increased by twice the amount when riders were not given carbohydrate drinks.

### What does this mean?

There are a number of variables to be taken into account before drawing any conclusions from this research. The type, duration and intensity of the exercise in conjunction with the age and fitness level of the subject will all have an impact upon the immune system's response to training.

This research shows that trained male cyclists who complete 2 hours of training at 90% of anaerobic threshold may benefit from carbohydrate supplementation. The effects may be different if the intensity was lower or the duration reduced.

To train day after day the body must recover effectively or the rider will risk overtraining, one of the key aspects of recovery is immune function. Elevated Interleukin-6 has been given as a possible explanation for overtraining / chronic fatigue syndrome and inflammation caused by the immune system has other potential consequences such as suppressed red blood cell formation.

### **Conclusion**

Without making any presumptions, if you are training on a daily basis and many of those sessions are high intensity (90% anaerobic threshold or above), you could well benefit for using sports drinks in every session to help maintain consistency and prevent fatigue.

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