

FATS

SHOW BUSINESS

Following on from last month's article on fat, Joe Beer gives you more facts about optimising your metabolism and recovery during training

Fat is a naughty word. Slimming cultures pray it will disappear, healthy cooks preach of its high calorific content and health educators plan large-scale crusades against its usage. Meanwhile, athletes believe fat is the anti-Christ and use Holy (carbo) water and Holy bread (pasta, rice and so on) to fend off any possible fat.

Fear not. Fat is your friend - its accumulation is your enemy. Why is this so? Because your body's primary function is to conserve energy. Too much total energy per day, or too much in any one sitting, and your body stores it for later. In some cases this 'later' is about four million light years away as they already have more than their fair share of adipose insulation.

Consider an athlete of 10% bodyfat versus one with 15% fat (assuming equal lean body mass) the latter will be carrying more "excess luggage". He/she will be unable to maintain a similar effort when encountering an incline without reverting to precious carbohydrate stores. Put two bags of sugar in a haversack on the next training run and see what I mean.

Even our 10% athlete has plenty of energy stored as fat. Referring to figure 3 it can be seen that fats are a more

efficient store of energy and you have more abundant total calories for use from fats than from carbo. But fat cannot supply energy as quickly as carbohydrate, nor can it be used in anaerobic metabolism. For example, exercise at 70% VO_2 Max will derive 47% energy from fat, but more than 60% is derived from fat at 50% VO_2 Max. Why exercise at such a low level? An increased level of blood lactic acid (a by-product of anaerobic metabolism, for example a hard uphill effort) will reduce fat usage and deplete vital glyco-gen supplies in the muscle..

Insulin (which may be released following large doses of carbohydrate prior to exercise (eg. breakfast an hour before a long ride, see 220 August 1991) will also reduce fat usage and promote premature

How does L-Carnitine help athletes?

- * Fat metabolism is increased
- * There is a greater fat burning capacity
- * The carbohydrate system receives less stress
- * Recovery is quicker
- * Efficiency is enhanced
- * Training can be resumed sooner

Figure 2.

carbohydrate depletion. Researchers Christensen and Hansen (1939) had subjects on various diets to compare endurance and substrate usage (ie carbo v fats) in a cycling task. Hi-carbo cyclists endured four hours, mixed diet (50/50) managed three hours and hi fat athletes (<5% from carbo) endured 1.5 hours.

Although reduced capacity was clearly illustrated (probably due to a poorly developed fat burning system) the subjects were still able to carry out exercise using fat almost exclusively as the source of fuel for 1.5 hours.

The study also indicated that on hi-carbo even the later part of the exercise utilised only 25% of energy from fat, while during hi-fat diets exercise subjects used over 70% calories from fat.

Fifty four years later we have even more research into this area of optimum fuel usage. The most recent development, which is still at the cutting edge of sports science, is L-Carnitine supplementation. This is a natural substance related to the B-group of vitamins, its primary function is to regulate the rate at which fat is burned by controlling the entry of fat into the mitochondria (the power house of aerobic energy production). See figure 1.

Research into the effects of L-Carnitine has been shown to : increase stamina; promote more economic use of glycogen; reduce lactic acid levels; and increase recovery rate.

What does L-Carnitine mean for triathletes?

First, enhanced fat metabolism (ie improved fat burning) has a glycogen sparing effect so training sessions can be extended and/or intensity increased for the same duration. Second, it is believed to reduce the stress placed upon the carbo-enzyme system thus reducing recovery time. See figure 2.

Several of my observations lend themselves to supporting the benefits mentioned above.

* While training in France it was evident that many athletes knew about, or were actively using, L-Carnitine supplementation - yet visiting Aussies were unaware of its existence.

* A popular French cycling magazine published a detailed article on the effects and best ways to use L-Carnitine (obvi-