

Carbohydrates and The Glycaemic Index

As mentioned Carbohydrate foods are essential for energy. The fuel used during intense training is mainly carbohydrate. After completing an intense muscle building training unit stores of carbohydrates in your muscles will be low. Recent evidence showed how weight training (doing multiple sets of squats) can virtually deplete your muscle stores of glycogen (the carbohydrate stores in your muscles). In studies where intense weight training was completed researchers showed that muscle glycogen stores in the working muscles were reduced by up to 40% just after completing one exercise over several sets (46,50). If this fuel is not replaced the muscle will not be able to continue to work at the same intensity. Other researchers showed just how important carbohydrates were in maintaining muscle work capacity during weight training. They had trained male subjects consume a carbohydrate drink 10 minutes before training and at 10 minute intervals during a 40 minute training session. The group drinking the placebo (coloured water) had double the muscle fuel loss after the training session compared to the carbohydrate group. This group of researchers went another step and had subjects perform a second training session after a 4 hour rest. The group ingesting carbohydrates were able to complete 34% more exercise repetitions than the placebo group (19).

The message is simple - make sure that you arrive to the training area with your carbohydrates if you want to get the best out of training.

Studies also inform us that when the intake of carbohydrates is increased between training sessions then the catabolic hormone or the hormone that is associated with stress and breakdown of tissue - cortisol - is reduced (27). Also there is good evidence to suggest that having adequate carbohydrates during periods of intense training will offer some protection to the immune system (2,26). Now that we have established that carbohydrates are crucial both before, during and after training and playing lets look at the quality of the carbohydrate that you should ingest.

The type of carbohydrates that you consume has a major bearing on your energy levels and your ability to adapt and develop. The Glycaemic Index (GI) is a very useful method of assessing the type of carbohydrate consumed.

The Glycemic Index is a scale that describes how fast a food is converted to glucose in the blood. Foods with a High Glycemic Index are converted to an easily absorbable sugar quickly and provide energy to the blood stream and muscles fast whereas foods with a Low to Moderate Glycemic Index are transferred into the blood stream at a slower rate but provide a more sustained

release of energy. Low to Moderate GI foods are recommended instead of high GI foods during the course of the day as they "drip feed" the system over a longer period of time, whereas high GI foods cause an insulin spike and may give rise to energy swings. However, there are times when this insulin spike as a result of High GI foods can be exploited to good effect especially for the sports player.

Sports nutritionists recommend that high GI foods and beverages are consumed immediately after training so that the player can get the much needed fuel (glucose) into his blood stream and then to his muscles to restore used fuel. However, it makes sense to do this during exercise as well. Ingesting a carbohydrate-electrolyte beverage during training or playing will help to maintain blood sugar and insulin which encourages sugar uptake from the blood stream into the working muscles (30). Studies have shown that athletes and players can benefit through a greater work capacity during exercise from the high GI carbohydrates that are available from sports drinks (11, 21, 35).

See the list below of common foods and their Glycaemic Index. Have a close look at this list and become familiar with it.

The GI of some Common Foods

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Foods with a GI between 70 and 100 points enter the blood stream rapidly. They are called High GI foods. Foods that enter the blood stream at a moderate rate are called moderate GI foods and they are scored between 40 and 69. Low GI foods are scored lower than 40 and are slow at entering the blood stream.

NB: Sport drinks are high GI beverages.

The following foods enter the blood stream quickly:

100	Glucose
80-95	Corn flakes, Coco pops, Rice krispies, Cheerios, Toast and jam, Honey, Instant mashed potatoes, Carrots
70-79	Bread (whole-grain), White rice, Weetabix cereal, Potatoes

The following foods are moderate in their entry into the blood stream:

60-69	Bread (white), Rice (brown), Muesli, Shredded wheat cereal, Bananas, Raisins,
50-59	Sweet corn, All-Bran cereal, Oatmeal biscuits, Peas (frozen), Grapes
40-49	Spaghetti (whole-wheat), Oatmeal (porridge), Potatoes (sweet), Beans, Peas (dried), Oranges, Orange juice

The following are slow to enter the blood stream:

30-39	Black-eyed beans, Haricot beans, Chickpeas, Apples, Yoghurt, Tomato soup
29-29	Kidney beans, Lentils, Fructose
10-19	Peanuts

Key Point 4

- **Carbohydrates are essential for the athlete and player.**
- **Increase the amount of carbohydrates consumed when training demands increase.**
- **The type of carbohydrates consumed should vary depending on whether you are training or not**
- **Consume mainly Low to Moderate GI carbohydrate foods at all meals and snacks**
- **High GI foods speed the entry of nutrients into the blood stream and are therefore suitable immediately before, during and following training**