

# Carbohydrate

## Nutritional friend or foe....?



**Carbohydrate is a very important nutrient sometimes misunderstood due to the recent popularity of low carb eating plans & fad diets. Whilst too many carbs can indirectly lead to weight gain, “low-carb” diets can contain as little as 20g of carbohydrate per day – which is difficult and unsustainable for any individual, no matter how dedicated they are! Carbohydrate provides fuel for the body and is the primary energy source for the brain & central nervous system. This information sheet provides basic facts on carbohydrate sources and their role in the diet.**

As detailed in the ‘Nutrition 101’ information sheet carbohydrate is a macronutrient providing 17kJ of energy per gram. Carbohydrates come in a number of chemical forms which can have markedly different tastes and digestive properties. An example is the simple carbohydrate molecule

glucose which is very sweet & rapidly processed compared to starches which are non-sweet, long chains of sugars. These take much longer to digest & absorb into the bloodstream. The table below details the major carbohydrate sources within the modern western diet.

| CARBOHYDRATE SOURCE      | CHEMICAL FORM                         | FOOD SOURCES   |
|--------------------------|---------------------------------------|--|
| Glucose (or dextrose)    | Single molecule                       | Both naturally occurring and added as an ingredient to many sweet foods.     |
| Fructose                 | Single molecule                       | Naturally occurring in fruits & honey.                                       |
| High Fructose Corn Syrup | Single molecule                       | A chemically derived food ingredient found in soft drinks and confectionary. |
| Galactose                | Single molecule                       | Naturally occurring in cow’s milk and found in many dairy products.          |
| Sucrose                  | A glucose & fructose molecule joined  | Cane sugar (table sugar) and is added as an ingredient to many sweet foods.  |
| Lactose                  | A glucose & galactose molecule joined | Naturally occurring in cow’s milk and found in many dairy products.          |
| Maltose                  | Two glucose molecules joined          | Malt products & some cereals.  |
| Maltodextrin             | A long chain of glucose               | A chemically derived food ingredient found in many processed foods.          |
| Starch                   | A long chain of glucose               | Naturally occurring in breads & cereals, rice and pasta                      |

**Can you correctly identify the major carbohydrate source in the following foods?** (for answers refer page 2)



The major carbohydrate source is \_\_\_\_\_



The major carbohydrate source is \_\_\_\_\_



The major carbohydrate source is \_\_\_\_\_



The major carbohydrate source is \_\_\_\_\_ & \_\_\_\_\_

**Dietary carbohydrates undergo digestion** in the small intestine and are biochemically broken down into single molecule form (glucose, galactose & fructose) for absorption into the bloodstream and transportation to the liver. Carbohydrate that is not required as an immediate energy source is stored in the liver and skeletal muscle in the form of glycogen. Although a major energy source, the body doesn't have significant carbohydrate storage capacity compared to other macronutrients such as fat & protein. Hence the reason why each meal or snack should contain a portion of carbohydrate to top up blood sugar levels to keep the body & brain working! This is very important for active people & athletes who are burning far more carbohydrate than they would in a sedentary state and often require a carbohydrate "top-up" whilst exercising. In team and individual sports, Sports Dietitians can help to make the carbohydrate provisions available during a match or competition (with a bit of help and support from the coach and trainers involved!)

### What about GI?

The 'Glycemic Index' (or "GI" as it is also known) is a method of classifying different types of carbohydrate rich foods. When it comes to digestion rate, carbohydrates can behave differently within the body. GI is a ranking of foods from 0-100 according to the extent to which they raise blood -glucose levels after eating. Foods with a high GI (>69) are those which are rapidly digested & absorbed resulting in marked increases in blood glucose levels. Low GI foods (<55) are more slowly digested & absorption producing a gradual rise in blood sugar. See table below that shows the difference in the rise of blood glucose levels between high and low GI foods.

Low GI foods are preferable as they can help to delay hunger and control appetite, and therefore have benefits for healthy weight management. High GI foods do however have a role to play in the diets of active individuals & athletes. During and immediately after training sessions and competition, high GI foods can be useful to quickly top up dwindling blood sugar levels to fuel working muscles and enhance time to recovery.



Fig 1: Glycaemic response to different foods.

## Can you correctly match the GI and foods below?

(for answers refer below)

**GI Options: 80 70 32 55**

**Skim Milk GI = \_\_\_\_\_ Brown Rice GI = \_\_\_\_\_**

**Jelly Beans GI = \_\_\_\_\_ White Bread GI = \_\_\_\_\_**

Daily carbohydrate requirements vary among individuals and there is currently no set Recommended Dietary Intake (RDI) for this nutrient. However, primarily choosing healthier carbohydrate sources e.g. low GI whilst moderating intakes of highly refined carbohydrates contributes to a well-balanced diet. For advice on individual carbohydrate requirements, visit a Sports Dietitian near you: go to <http://www.sportsdietitians.com.au/findasportsdietitian/>

**For more information on sports nutrition visit Sports Dietitians Australia: [www.sportsdietitians.com.au](http://www.sportsdietitians.com.au)**

**COMING UP IN THE NEXT EDITION**  
**We'll look at Protein in more detail....**