Glycemic index

The Glycemic index (GI) measures how fast a food is likely to raise your blood sugar, it is fixed in the area under the curve (AUC) nof blood glucose, consequently after consuming 50 or 75 grams of carbohydrates available of the same food. It is compared with the area under the curve (AUC) of blood glucose, consequently after consuming 50 or 75 grams of glucose = 100.

A wide range of recent data suggests that food products with low GI have a more favourable impact on health, it especially helps reduce the risk of developing diabetes and cardiovascular diseases (like myocardial heart attacks) in respect to food products with a high GI.
Therefore a diet with a high GI can be detrimental to your health; it increases the risk of becoming overweight or obese, of changing the lipidic metabolism, of altering the glycedic intolerance and, last but not least, of coronary heart disease.
Recently epidemiologic studies have confirmed that those who consume high GI foods have a constant increase of glycemia, thus increasing the chances of developing Type 2 diabetes or to incur in coronary problems, respect to those who follow a low GI diet.

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Glycemic Index

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Glycemic Load

The increase in glycemic a is determined both by quality, or IG, and by quality of metabolized carbohydrates. You can establish the real glycemic answer caused by a nutrient by calculating the glycemic load (GL) : you multiply the IG by the quantity of carbohydrates expressed in grams, and divide the result by 100.

The glycemic load (GL) is major in nutrients that contain a high percentage of carbohydrates, especially if you consume copious quantities.

For example:

White bread type 00 – in a portion (100 gr) of white bread type 00 there are 66,9 g of carbohydrates and the GI is equal to 79.

The glycaemic load is (66,9 x 79) : 100 = 52,85

Therefore GL = 52,85

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Glycemic Index & health

It has been clearly demonstrated, through recent scientific nutritional studies, that a diet and its components are able to influence the state of health, modulating favourably or unfavourably many of the physiological aspects, as the functioning, of our organism.
It is, therefore, important to be familiar with the basic components of food and the effects of those components in our body relating to factors such age, state of health, and way of life so that they can be correctly introduced in our diet.
The attention of the experts, which was primarily oriented toward the caloric content of foods, their composition in terms of carbohydrates, fats and proteins, and the absence of toxic substances or bacterial contamination, has shifted towards the effects of the "functional" types of various nutrients.

Up to a few years ago, carbohydrates (often known as "sugars") in a diet, were classified into two types, "simple" and "complex" in order to define its role in food and health.
Fructose and saccharose, or better known as table sugar, are defined as simple sugars, whereas foods with a starch base, made up by more than one molecule of glucose (a simple sugar) linked together in a long chain, are defined as complex sugars.
The indications to prefer foods with complex carbohydrates (commonly found in nutritional tips propagated up to a few decades ago) was based on the assumption that consuming starch would keep down glycemia (level of blood glucose) therefore, those foods would be less harmful to our health.
The truth is, glycemia responds in a rather variable way to the contribution of complex carbs. Bread induces a higher increase of pasta, and both induce an increase of glycemia less than that associated to eating potatoes.
The simple sugars also have a variable effect: the consumption of fructose, for example, (fruit sugar) does not induce an important increase of glycemia.

Recent classification dispense the distinction of carbohydrate in "simple" or "complex", it is preferred to rank carbohydrate foods based on their effects on blood glucose levels: the measure of the effects is known as "Glycemic Index". The concept of Glycemic Index, in regards to the carbohydrates it contains, is a factor of major biological interest, in fact it is widely accepted in the nutritional world, amongst dieticians and certified food scientists.

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The glycemic index describes and measures the effects of carbohydrate foods on blood glucose levels, it is therefore a more accurate and consistent indicator of the glycemic response, it is now the characteristic element of major interest to this regard.

The glycemic index of a food is determined by monitoring, at constant intervals, the blood glucose level on a group of healthy subjects, in a two hour period following the ingestion of a fixed portion of 50 grams of total sugars. The curve of the blood glucose response is then matched with what we observe on those same subjects, following the ingestion of an equal amount of a reference food (pure glucose). The values between the areas under the curve of glycemia, after the intake of the test food and the intake of glucose, shown in percentage, represents the final Glycimic Index value for the test food.

The rapid increase in blood sugar, which takes place after eating high Glycemic index foods, is followed by secretion of the pancreas of a well known hormone, insulin, which facilitates the use of sugars or its deposit in the form of fats in the body. Throughout the following hours, the effect of insulin may cause a drop in glucose causing “hypoglycemia” and thus, stimulating hunger.
To the contrary, after eating low Glycemic index foods with low-calorie contents, we can notice a more moderate and protracted increase of blood sugar level: as a consequence minor secretion of insulin (therefore a more balanced use of fats and sugars used as energy source by the organism) which means less hunger and longer-lasting.

More precisely and significantly than the calorie intake of sugars is the so-called “Glycemic load” which takes into consideration both the quality and the quantity of the carbohydrates provided by a meal or a diet. The Glycemic load can be calculated by multiplying the quantity of the carbohydrate contents of various foods ingested with the Glycemic index for each single food.
For example, 80 grams (2,82 oz.)of potatoes – average Glycemic Index is 90 (see chart below) will be less than that of a 150 grams (5,30 oz.) of spaghetti - Glycemic Index = 38. In the former case the Glycemic load will be 72 (80x90/100) and the Glycemic response will be similar to that observed after the consumption of 72 grams (2,54 oz) of glucose, while in the latter case it will be equivalent to 57 (150x38/100).
It is interesting to underline that several studies have demonstrated that low

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Glycemic load diets can improve, at least for a short period of time, weight loss and fatty mass compared to high Glycemic load diets.
The reduction of the total Glycemic load helps keep hunger under control, maintain low ponderal level and control overweight. Some important sources of cardiovascular risks (such as triglyceride and "good" cholesterol HDL) and the indicators of the "inflammatory state" of the organism, joined in multiple ways to our state of health, are favourably influenced by the consumption of low Glycemic load and Index foods.

A diet rich in high Glycemic index foods, instead is associated, in addition to the increase of the triglyceride levels and the reduction of cholesterol-HDL level ("good" cholesterol), to an increased risk of developing type 2 diabetes (excessive release of insulin results in the functional loss of pancreatic tissues induced by their use.

Glycemic Index (GI) of certain foods based on glucose

FOODS	GI
Tomatoes	9
Cherries	24
Beans	30-45
Apples	38
Pasta (spaghetti)	38
Apple juice	40-44
Honey	45-87
Orange juice	46-54
Pasta (macaroni)	49
Boiled rice	49-69
Non-diet soft drink	50-65
Pizza	55-75
Saccharine	60-67
Mashed potatoes	68-77
White bread	70-75
Corn-flakes	72-87
Boiled potatoes	80-100
Glucose	**100**

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Fibers

The term dietary fiber is used to indicate the carbohydrates present in foods such as fruit, vegetables, cereals, legumes and seeds, its role is generally of structural nature – it can be defined as the "backbone" of these foods – it is indigestible for the human organism since it lacks the required enzymes.
Sources of dietary fiber are usually divided into 2 big categories, according to the different structure and properties: the water-soluble fibers (gums and pectins) and the insoluble fibers (cellulose, hemicelluloses and lignin).

Soluble fibers, present in legumes and in fruit, form dense (viscous) solution in water, which slow down the intestinal evacuation. The presence of significant quantities of soluble fibers, reduces the speed of absorption of fats and sugars: as a result the rise of triglyceride and blood glucose levels after eating is less rapid, reducing glycemia and lipidemia after meals. The process of slowing down the rise of glycemia is of particular consideration, in virtue of the interesting metabolic modifications that this induces (refer to above chapter on Glycemic Index).
The reduced absorption of fats and cholesterol induced by the soluble fibers brings about a decrease of the cholesterol level in the blood. On the whole, the effects of consuming appropriate amounts of soluble fibres are the reduction of coronary heart disease risk factors and within certain limits, considering an active lifestyle, developing overweight problems or obesity.

Insoluble fibers have less evident metabolic effects, but they activate intestinal motility, its water-attracting properties help to increase bulk and soften stool.
An adequate contribution of these fibers, is particularly helpful to those with constipation problems. Insoluble fibers can also function as anticarcinogen for the large intestine: the speedy stool transit time in the intestinal tract shortens the contact of the toxic waste and the intestinal mucous, preventing microbes from producing cancerous substances in the intestinal wall.

The recommended intake of fiber, for a healthy person, is 30-35 gms per day.

Fresh fruit contains as an average 1 to 5 grams of fiber every 100 gms of edible part; dried fruit 5 to 15 gms. Produce products contain, on an average, 1 to 7/8 gms of fiber; legumes contain higher quantities, between 10 and 20 gms (dried beans). Cereals and derivatives contain from 2,5 up to 22,5 grams (bran).

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G.I. table of some common foods

G.I. < 55	55 > G.I. < 70	G.I. > 70

BREAKFAST CEREALS

Bran Sticks/All Bran	30
Whole wheat Flakes	37
Oat Flake Pudding	42
Crunchy M¸esli	43
Traditional/Natural M¸esli	49
Bran Cereals (rice & whole-wheat) Low-Lipidic Contribution (1%)	54
Chocolate Corn Flakes	55
Whole wheat Flakes	58
Flake Cereals (rice and whole-wheat)	66
Flake Cereals (dried fruit, nuts, sugar, mineral salts, and vitamins)	68
Whole Wheat Cereals with Bran and Raisins	73
Chocolate Flake Cereals	77
Corn flakes	77

PASTA AND RICE

Fettuccine to the egg – Dry Pasta	32
Vermicelli (Hard Wheat) – Dry Pasta	38
Spaghetti (Hard Wheat) – Dry Pasta	38
Rice Spaghetti or Vermicelli (100%) – Dry Pasta	40
Noodles SIGI lo scoiattolo – Resh Pasta	46
Rapidly Cooked Rice	46
Parboiled Rice	48
Bulgur wheat	48
Brown Rice	50
Buckwheat	54
Basmati Rice	58
Noodles (Hard Wheat) – Fresh Pasta	60
Lasagnas (Hard Wheat) – Fresh Pasta	60
Ravioli (Hard Wheat) – Fresh Pasta	60
Couscous	65
White rice, medium-grain (with Low-amylose)	83

BREADS

Rye Wholemeal	41
Dried Fruit (with Bran)	44
Pumpernickel	49
Crunchy Bran Bread	55
Rye Bread	58
Pizza with Cheese	60
Hamburger Bun	61
Crunchy Rye Bread	69
Bread-Sticks	69
Roll (Olive Oil)	72
White Bread (Wheat)	74
Wholemeal Bread	77
Pizza Margherita (cheese, tomatoes, oil)	75
Dark rey	76
Water Crackers (Low-Lipids)	78

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BREADS

White Bread Gluten-Free	80
Wholemeal Crunchy Bread	81
Focaccia Pizza	92
Baguette	95

BISCUITS / COOKIES

SIGI Shortbread	40
Chocolate Dried Cookies	42
Oat Biscuits (with bran and flakes)	55
Butter Cookies	55
Wheat Flour Dried Biscuits (Type 00 & whole wheat flour)	62
Soft Biscuits (sweet-bun)	64
Milk Biscuits	69
Vanilla Wafers	77
Tea Biscuits (Cracker)	79

CAKES AND TARTS/PASTRIES

Chocolate Cake	38
Vanilla Cake	42
Apple Muffins (Snacks)	44
Apple & Sugar Dessert	44
Sponge Cake (with potato flour)	46
Banana Cake	47
Chocolate and Nuts Cake	53
Blueberry Muffins	59
Tarts/Pastries	59
Carrot Cake	62
Sponge Cake	65
Angel Food Cake	67
Croissant (high-lipidic contribution)	67
Waffles	76
Chocolate And Coconut Pound Cake	87

VEGETABLES

String Beans	38
Sweet Potatoes (new crop)	44
Carrots	49
Sweet Corn	54
Beets (Canned)	64
Turnip	72
Pumpkin	75
Potato Chips	75
Roasted Potatoes	85
Boiled Potatoes	90
Mashed Potatoes	91
Parsnip	97

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LEGUMES

Dried Soy Beans	20
Black-Eyed Peas	28
Dried Chickpeas (cooked)	28
Pinto Beans (cooked)	28
Lentils	29
Cannellini Beans (cooked)	31
Canned Chickpeas	42
Canned Cannellini Beans	45
Fresh Peas	48
Baked Beans	48
Frozen Peas (cooked)	48
Canned Pinto Beans	52
Fresh Beans	79
Canned Runner Beans	79

FRUITS

Cherry	4
Grapefruit	25
Dried apricots	30
Apple	38
Pear	38
Plums	39
Strawberry	40
Orange	42
Fresh peach	42
Grapes	46
Mango	51
Banana	52
Dried currants	56
Kiwi	58
Peaches in syrup sauce	58
Dried figs	61
Dried raisins	64
Pineapple	66
Melon / Cantaloupe	72
Dried dates	103

DAIRY PRODUCTS

Milk, full fat	27
Milk, skim	32
Yogurt, low fat	33
Yogurt, low fat, fruit, sweetened	33
Yogurt, full fat	36
Chocolate Milk	42
Heavy cream	43
Ice-cream, Low-Lipids	50
Traditional ice-cream	61
Condensed milk	61

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DRINKS

Apple juice	40
Orange juice	52
Colas	53
Orange juice soda	68

SNACKS & READY-TO-EAT FOODS

Peanuts	14
Tomato soup	38
Corn chips	42
Lentil soup	44
Sushi	48
Pea soup	66
Popcorn	72

SWEETS

Dark Chocolate bar	44
White Chocolate bar	44
Muesli bar	61
Chocolate & toffee bar	62
Fruit Jelly	78

SUGARS

Fructose	19
Lactose	46
Honey	55
Table sugar	68
Glucose	100

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