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## **PRE-EXERCISE AND POST-EXERCISE NUTRITION**

For many years, pre-exercise meals were thought to provide the extra energy boost athletes needed for practice and competition. At the same time, post-exercise nutrition was considered to have very little impact on an athlete's performance. We now know that **pre-exercise meals may provide a small energy boost, but they may also be detrimental to performance, if the wrong foods are eaten.** We also know **post-exercise nutrition is extremely important to an athlete's recovery from exercise and their performance in the coming days.**

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Determining whether a food is better for pre-, or post-exercise is no longer as simple as determining whether that food is a complex, or simple, carbohydrate. Some complex carbohydrates are poor pre-exercise choices and some simple carbohydrates are poor post-exercise choices, which is contrary to what was previously thought. **The determining factor as to which foods and beverages are a better pre-, or post-exercise choice is "glycemic index."** The **glycemic index of a food, or beverage, indicates on how quickly that particular food raises the glucose (sugar) level in the blood.** A quick increase in blood sugar levels can potentially lead to a lower blood sugar level later due to the insulin response by the body.

**The determining factor as to which foods and beverages are a better pre-, or post-exercise choice is "glycemic index."**

Foods and beverages with a low-to-moderate glycemic index provide longer lasting, more sustained energy. Therefore, **pre-exercise foods and beverages**

should have a low-to-moderate glycemic index. Post-exercise foods and beverages should have a higher glycemic index in order to replenish energy supplies more quickly. High glycemic foods and beverages should be consumed within 30-minutes after exercise, then again with 2-hours after exercise, in order to maximize the refueling of the body.

**Pre-exercise foods and beverages should have a low-to-moderate glycemic index, and post-exercise foods and beverages should have a higher glycemic index.**

**High glycemic foods and beverages should be consumed within 30-minutes after exercise, then again with 2-hours after exercise, in order to maximize the refueling of the body.**

The glycemic index of a food or beverage is affected by many complicating factors. Fortunately, charts allow us to quickly, and accurately, determine the glycemic index of many foods and beverages. Foods with a lower glycemic index typically have a higher fiber content, contain more fructose, and are less processed than foods with a higher glycemic index. Potatoes are high in starch and have long been believed to be an excellent pre-exercise food. Unfortunately, the kind of starch they contain gives them a high glycemic index, which makes them more appropriate for post-exercise than pre-exercise.

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When eaten with a meal, foods with a high glycemic index may not cause the same rapid rise in blood sugar as when they are eaten alone. This is due to the fat and protein in other foods helping to offset the body's response to the high glycemic index foods. Foods containing some fat and protein also help one feel full without eating as much. Foods with a high glycemic index are not as filling as those with a lower glycemic index, so when people eat foods with a higher glycemic index they tend to eat more and get hungry more quickly.

## GLYCEMIC INDEXES OF SOME COMMON FOODS

Foods listed from highest to lowest glycemic index within each category.

### Breads & Grains

rice, instant	91
waffle	76
doughnut	76
bagel	72
wheat bread, white	70
cornmeal	68
rice, white	56
oat bran muffin	48
bread, whole wheat	47
rice, long grain	47
spaghetti, white	41
wheat kernels	41
whole wheat	37
barley	25

### Cereals

Rice Krispies	82
Grape Nuts Flakes	80
Corn Flakes	77
Cheerios	74
Shredded Wheat	69
Grape Nuts	67
Life	66
Oatmeal	49
All Bran	42

### Fruits

watermelon	72
pineapple	66
raisins	64
banana	53
grapes	52
orange	43
pear	36
apple	36

### Starchy Vegetables

potatoes, baked	83
potatoes, instant	83
potatoes, mashed	73
carrots	71
sweet potatoes	54
green peas	48

### Legumes

baked beans	48
chick peas	33
butter beans	31
lentils	29
kidney beans	27
soy beans	18

### Beverages

soft drinks	68
orange juice	57
apple juice	41
pineapple juice	46

### Dairy

ice cream	61
yogurt, sweetened	33
milk, skim	32

### Sugars

honey	73
sucrose (table sugar)	65
lactose	46
fructose	23

### Snacks

rice cakes	82
jelly beans	80
graham crackers	74
corn chips	73
Life Savers	70
angel food cake	67
wheat crackers	67
popcorn	55
oatmeal cookies	55
potato chips	54
chocolate	49
banana cake	47
peanuts	14

Glycemic index was calculated using glucose as the reference with GI of 100. Modified from Foster-Powell and Brand Miller (1995). Glycemic index was calculated using glucose as the reference with GI of 100. Modified from Foster-Powell and Brand Miller (1995).

## COMPARISON OF FOODS WITH HIGHER VERSUS LOWER GLYCEMIC INDEX

Foods listed alphabetically within each category.

High glycemic index foods = more than 70

Moderate glycemic index foods = 55-70

Low glycemic index foods - less than 55

<u>Higher Glycemic Index</u>	<u>GI</u>	<u>Lower Glycemic Index</u>	<u>GI</u>
Angel Food Cake	67	Banana Bread	47
Bagel	72	Oat Bran Bread	48
Baked Potato	83	Spaghetti	41
Cheese Pizza	60	Baked Beans	48
Corn Flakes	77	All Bran	42
Cream of Wheat, instant	74	Oatmeal	49
French Fries	76	Peanuts	14
Graham Crackers	74	Oatmeal Cookie	55
Pretzels	81	Potato Chips	54 ( <i>but high in fat</i> )
Rice Cake	82	Popcorn	55
Rice, instant	91	Rice, long-grain	47
Waffles	76	Apple Muffin	44
White Bread	70	Whole Wheat Bread	47
Orange Juice	57	Skim Milk	32
Pineapple	66	Pears	36
Raisins	64	Plum	24
Watermelon	72	Banana	53
Cola	68	Apple Juice	41
Ice Cream	61	Fruit Yogurt	33
Honey	73	Pineapple Juice	46

*Sources:* "Carbohydrates and the Glycemic Index," Harvard School of Public Health Nutrition Source, 2003; "Eating for Health & Athletic Performance: The Glycemic Index," John Kirwan, Ph.D., FACSM., Exercise & Sports Sciences Review, Summer 2003; "Glycemic Index & Exercise Metabolism," Janet Walberg Rankin, Ph.D., Gatorade Sports Science Exchange, Volume 10, 1997; "Using Glycemic Index to Improve Athletic Performance," Bob Murray, Ph.D., FACSM, Gatorade Sports Science News, 2002; "Your Guide to Glycemic Index," Holly McCord, RD., Prevention.com, 2003.

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