

# Nutrition: Carbohydrates

## WHY ARE CARBOHYDRATES SO IMPORTANT FOR ATHLETES?

- Carbohydrates are the main source of energy in the diet.
- Carbohydrates are the fuel of choice for exercise at higher intensity levels over time.
- High-carbohydrate foods like fruits, vegetables, and whole grains are excellent sources of vitamins, minerals, and fiber.

### Where can I get carbohydrates?

- Carbohydrates are the starches and sugars in foods.
- Good sources of carbohydrates are:
  - Fruits and fruit juices
  - Pasta and rice
  - Starchy vegetables (corn, peas, potatoes)
  - Dried beans
  - Sports drinks
  - Energy bars and gels
  - Bagels, bread, cereals
  - Milk

### Choosing carbohydrates wisely

- Carbohydrates differ in the rate at which they increase the blood sugar (glucose) level. The rate at which a carbohydrate raises blood sugar is its glycemic index (GI).
  - High GI = rapid rise in blood sugar
  - Low GI = slower rise in blood sugar
- Low-GI carbs provide slower, more moderate and steady blood sugar levels over the course of the day.
  - This is important for sustained energy.
- High-GI carbs, consumed after a workout, can help improve muscle recovery from exercise.
  - Protein in addition to carbs is even better.
- Avoid excess intakes of added sugars (e.g., sodas, candy) that contribute calories, but few nutrients.

### Examples of higher and lower GI carbs

- **Lower GI:** Minimally processed oats (e.g., steel cut), apples, and most fruits, bran cereal, basmati and most longer-grain or less instantized rices, spaghetti, dried beans and lentils, milk and yogurt, sweet potatoes, carrots and other nonstarchy vegetables, and slowly digested sugars such as isomaltulose or sucromalt
- **Higher GI:** White bread and bagels, white potatoes, instantized rice, cookies, honey, energy gels, sports drinks and sodas, jelly beans

### What kind and how much carbohydrate do I need in my diet?

- Build your diet based on low GI, more nutritious carbohydrates.
- Concentrate on getting carbohydrates with adequate fiber.
  - Whole grains, fruits, vegetables
- Depending on duration and type of exercise, carbohydrate needs differ:
  - Moderate intensity and duration of activity 2-3 times/wk: 2-3 g per pound
  - Higher intensity and duration of activity 4-6 times/wk: 4-5 g per pound



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## Planning and distributing carbohydrate intake over the course of the day

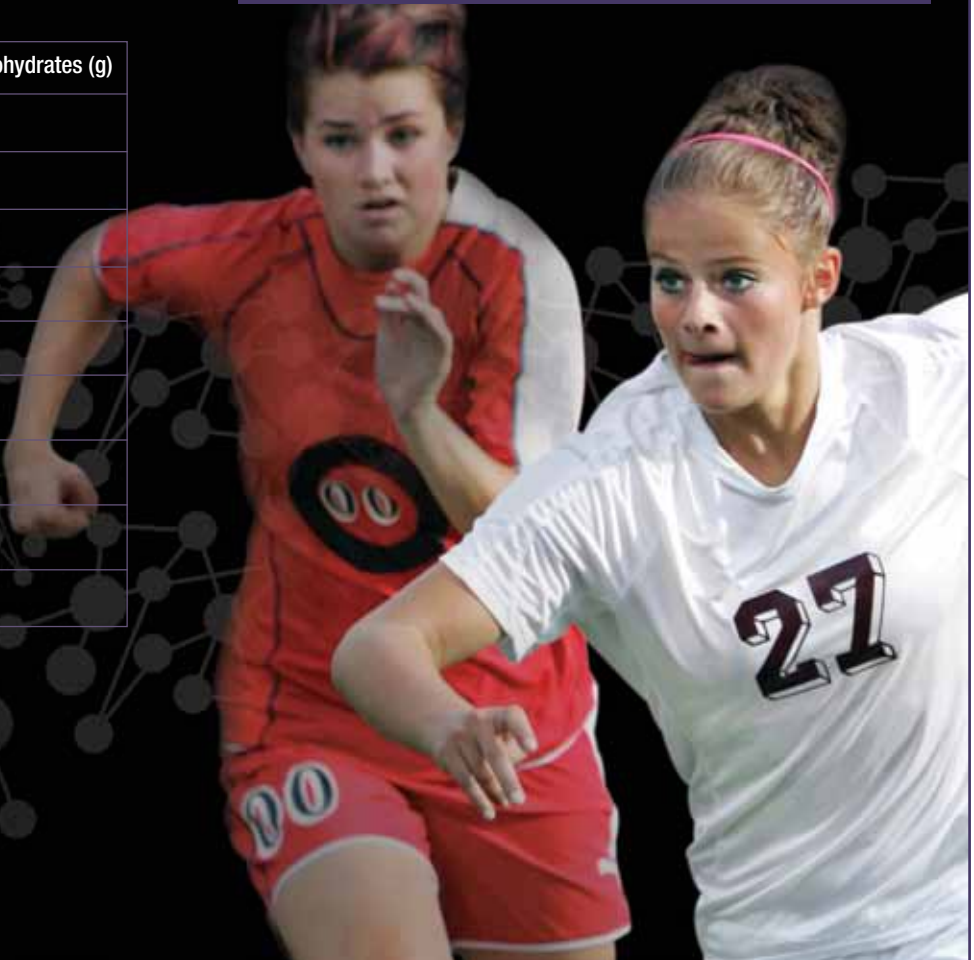
Here is a sample profile for a male athlete named Sam. Sam's needs are listed below along with a sample plan for his carbohydrate intake.

- Age: 14 y
- Weight: 130 lbs.
- Height: 5 feet 7 inches
- Activity: Running, biking, some strength training
- Duration of activity: 120 min/day (from 3-5 p.m.)
- Frequency of activity: 4-5 times per week
- Calorie needs: About 3,400 per day
- Carbohydrate needs: 520 g per day (about 4 g per pound)

## FOODS PROVIDING ROUGHLY 25-30 G CARBOHYDRATE

- 1 cup juice or 1 large piece of fruit
- 1 bagel or 2 slices of bread
- 1 cup of most cereals
- 1 large baked potato
- 2 cups milk
- 2/3 cup of dried beans
- 1 cup of rice or corn
- 1 cup of winter squash
- 2-1/2 cups of tomato juice
- 2 cups of a sports drink
- 1/2 to 1 energy bar, depending on brand
- 1 packet of an energy gel

Meal	Time	Carbohydrates (g)
Breakfast	7:00 a.m.	100
Mid-morning snack	10:00 a.m.	25
Lunch	Noon	100
Pre-exercise meal	1:30-2:00 p.m.	30
During exercise	3:00-5:00 p.m.	80
Post-exercise meal	5:00 p.m.	60
Dinner	6:30 p.m.	100
Nighttime snack	9:00 p.m.	25
	<b>TOTAL</b>	<b>520</b>



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