Nutrition: Carbohydrates

Why are carbohydrates so important?

- 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 sucramalt.

- **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
- Height: 5 feet 7 inches
- Weight: 130 lbs.
- Kcal need: 3,400 per day
- Carbohydrate need: 520 g per day (about 4 g per pound)
- Protein need: 100 g per day

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

**TOTAL**          | **520**       |

**SOURCES OF CARBOHYDRATES FOR THE MEAL PLAN**

- 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
- 14 oz. Myoplex Strength®

EAS products that can help you get the right carbs at the right time

**Myoplex Strength®**: Provides 23 g carbohydrate and 25 g protein per bottle. Myoplex provides rapidly available carbohydrate fuel to recovering muscle and protein for structural repair of muscle damage due to exercise.