

# Carbohydrates in Sports Nutrition

Carbohydrates are an important source of energy during exercise. It is a source of fuel for your brain and muscles. Your muscles and liver store carbohydrates in the form of glycogen. During exercise, especially intense exercise like soccer, interval training or cross fit, glycogen is broken down to sugar (glucose) and used for energy by your muscles. Glucose released from your liver helps to keep blood glucose levels stable and keep you feeling focused. Low glycogen stores can leave you feeling tired and make your training, exercise or sporting event feel harder. Getting enough carbohydrate in your diet helps you have enough glycogen stored to provide you with the energy you need to perform at your best.



## Steps you can take

- | Eat nutritious, carbohydrate-rich foods throughout the day as part of a well-balanced diet. Healthy choices include whole grains like whole grain breads, cereals and pastas, quinoa and brown rice; vegetables and fruits; milk and milk products; and legumes such as chickpeas, lentils, and black beans. Sports drinks and gels contain carbohydrate but are less nutritious. They can be helpful if your exercise is intense and food is hard to eat, or if your exercise lasts longer than one hour.

## Carbohydrates Before Exercise

- | Include carbohydrates in your pre-exercise meals or snacks. Plan to eat a meal or snack 1 to 4 hours before you exercise so that you're not too hungry or too full. This will help keep your blood glucose (sugar) levels stable and give you the energy you need to exercise. Focus on lower fibre choices as these are easier to digest. Choose smaller meals closer to the time you will be exercising.
- | Try these healthy meal and snack ideas:
  - | oatmeal with or without milk
  - | melba toast crackers with peanut butter
  - | stir-fry with chicken or tofu, rice, and vegetables.

## Carbohydrates During Exercise

- | Aim for 30 to 60 grams (g) of carbohydrates per hour, only if your exercise is intense and lasts longer than an hour. This can be helpful during full or half marathons, long cycling rides and races, and soccer and hockey games or tournaments. Smaller individuals can aim for the lower end of the range. See the table below for food suggestions and serving sizes.
- | Choose lower fibre, easily digested carbohydrate-rich foods if you need to eat while exercising. This will prevent an upset stomach, bloating, and cramping. Try pretzels, crackers, bananas, sports drinks and gels. Make sure you drink plenty of fluids with your food.

## Carbohydrates After Exercise

- | Eat a carbohydrate-rich meal or snack after intense exercise lasting more than an hour. This will help refill your glycogen stores for the next time you exercise. This is important if you exercise or compete twice on the same day, or exercise on back-to-back days. Try to eat this meal or snack within the first 30 minutes after your activity. To rebuild your glycogen stores you may need to eat again within 4 hours of your first event.
- | A carbohydrate-rich recovery snack or meal is not needed if you exercise less often or after lighter activities, like walking, yoga, leisure swimming or bike riding.

Examples of some healthy post-exercise meals or snacks include:

- | a turkey sandwich, an apple, and some low-fat yogurt
- | salmon, sweet potato, and mixed vegetables
- | a smoothie with bananas, berries, low-fat milk and yogurt
- | a cup of low fat milk or fortified soy beverage and a piece of fruit.

Table: Carbohydrate Content of Some Common Foods

<i>Food</i>	<i>Serving Size</i>	<i>Carbohydrates (g)</i>
Bagel, plain	1 whole (100 g)	52
Banana	1 large (136 g)	31
Crackers, saltine	10 crackers (30 g)	22

Dates, natural dried	3 dates (24 g)	19
Pretzels	18 g (about 30 sticks)	15
Raisins, seedless	1 small box (42 g)	33
Sports drink (fruit-flavoured)	500 mL (2 cups)	25 to 40
Energy gel	1 package	21 to 25
Energy chews	3 pieces (30 g)	24

Reference: Canadian Nutrient File (2016), individual manufacturers

## Special Considerations

### Carbohydrate Loading

Carbohydrate loading is a strategy used by competitive and high-level athletes to maximize muscle glycogen stores before long, intense exercise training or competitive events like marathons, distance cycling, triathlons or soccer tournaments. Carbohydrate loading can be helpful when training lasts longer than 90 minutes and when it is hard to eat carbohydrates during exercise. Carbohydrate loading may help you to perform better and train longer than normal.

If you want to try carbohydrate loading, aim for 8-11 g of carbohydrate per kg of body weight per day (3.6 to 5.0 g per lb) for 1 to 3 days before your competition or training session, and while you are tapering. Tapering means that you are avoiding long runs or hard exercise or training sessions lasting more than an hour, as these activities use up glycogen stores. Divide the carbohydrates over your meals and snacks. Make sure to include some carbohydrate right after you finish any exercise that you are still doing.

Carbohydrate loading often comes with a short-term weight gain due to the water that is stored along with the glycogen but this is normal and short-term.

If you are going to try carbohydrate loading to improve your performance, first try it at least a few weeks before your sporting event to make sure it feels right for you.

For more personalized nutrition advice, work with a sports dietitian. You can find a sports dietitian at [www.dietitians.ca/find](http://www.dietitians.ca/find).



## Additional Resources

- 1 EaTracker <http://www.eatracker.ca>

*These resources are provided as sources of additional information believed to be reliable and accurate at the time of publication and should not be considered an endorsement of any information, service, product or company.*



## Notes

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