



## **Sports Nutrition Basics: Fueling & Recovery From Exercise**

Every time you exercise, you break down muscle tissue. **Protein** is needed to repair this damage and to build stronger tissues. Protein is found largely in meat, chicken, turkey, fish, eggs, soy and dairy products (such as milk, yogurt, cheese) as well as in supplements (e.g. bars and shakes).

The main fuel the body uses when a person exercises at a moderate to high intensity is *muscle glycogen* which is carbohydrate and water stored inside the muscles. This is true of sports that require high-intensity, short burst activity like volleyball.

**Carbohydrates** are found largely in grain products (examples: bread, pasta, rice, crackers, pretzels, cereal), potatoes, fruit and in sugar. Replacing muscle glycogen after exercise is essential to making sure enough fuel is available the next time you exercise. Not doing so, may leave a person feeling fatigued, unable to exercise as hard or to injury.



The goal of recovery nutrition is to convert the body from a state of tissue breakdown (catabolism) to a state of tissue repair and building (anabolism). Immediately after exercise, blood flow to the muscles just used is increased which primes them to receive nutrients. Consuming a snack within 30 minutes after exercise can help to replete the fuel (glycogen) used from these muscles and promote repair of their damaged tissues. The composition of the snack is important. The ideal recovery snack contains both carbohydrate, to help replace the glycogen that was used during exercise, and protein to repair tissues that were broken down. Recovery is not complete until a mixed fuel meal with more carbohydrates is consumed ~1 hour later.

A snack containing carbohydrate, protein and fluid immediately after exercise will:

- \* Decrease the core temperature of the body
- \* Replenish fluid lost while exercising
- \* Restore energy and fuel (glycogen) used
- \* Reduce muscle damage and speed repair
- \* Keep you healthy
- \* Improve performance





A carbohydrate-to-protein ratio of 3 to 4:1 is ideal to promote repletion of muscle stores with glycogen and to promote repair of muscle tissue. This is equivalent to:

15-25 g protein

45-75 g carbohydrate

Ideas for a snack immediately after exercise:

- Medium banana and a glass of low-fat milk
- Bagel with nut butter, raisins and a glass of low-fat milk
- String cheese with crackers, plus an orange or juice, water
- Beef jerky plus grapes, an apple, orange, and water
- Sports drink (carbohydrate, electrolytes, fluid) + sports bar (carbohydrate, protein)
- Graham crackers with nut butter and low-fat milk
- Chocolate milk (16 oz contains: 16 grams of protein, 52 grams of carbohydrates)
- Recovery shake containing protein
- Fruit smoothie made with greek yogurt
- Trail mix (dried fruit, pretzels, dry cereal, nuts & seeds) and a glass of low-fat milk
- Sandwich (lean deli meat/cheese or nut butter and jelly or honey)

Remember, recovery is not complete until you eat a balanced meal ~1 hour later.

A Word about Fluid Needs:

At least 2 hours before exercise, begin drinking fluids. This will help to ensure you are well hydrated before your event and have adequate time to use the restroom beforehand. Drink ~1 oz of fluid for every 10 pounds of body weight. Example: a 120 pound person, would want to drink 12 oz of fluids before exercise. Water is fine.

During exercise lasting less than 1 hour, water is the best fluid for repleting fluid lost through perspiration. For exercise lasting longer than 1 hour, a beverage containing electrolytes (especially sodium and potassium) and carbohydrates (from glucose, fructose) in the amount of 14-19 grams per 8 ounces is best.

\*The American College of Sports Medicine recommends consuming 20-40 oz of water over the course of 1 hour for high intensity exercise to prevent dehydration. This amounts to 5-10 oz every 15 minutes.





Your body also needs electrolytes like sodium, potassium, magnesium and chloride which are lost through sweat. These salts and minerals control where fluid is shifted in the body, and are important for muscle contraction and energy production.

Getting low in these vital nutrients may lead to symptoms such as: dizziness, weakness, muscle cramping, twitching or spasms, numbness, and overall fatigue.

Of these, sodium and potassium are lost in greater amounts. One pound of sweat contains ~80-100 mg of potassium and 400-700 mg of sodium. Snacks that will help replenish these necessary nutrients include:

- Pretzels
- Crackers
- Oranges
- Dried fruit like raisins
- Banana

Things to AVOID before and during exercise:

- High fat foods. Fat is digested more slowly so will literally stay in your stomach longer which may lead to nausea, intestinal cramping, a heavy feeling and fatigue during the activity. Examples: fatty meats such as bacon or sausage, cheese, nut butters, nuts and seeds, fried foods, cream sauces, croissants and pastries.
- Too much sugar may lead to an energy “crash” or fatigue later.
- Carbonated beverages put gas into your intestinal tract which may lead to bloating and stomach upset.
- High fiber foods are harder to digest so may lead to bloating, gas, intestinal cramping and pain. Examples: beans, bran and other high fiber cereals and supplements, gas-forming vegetables like raw broccoli, cauliflower and peppers
- Any other food or beverage you’ve noticed you have difficulty digesting. Choose foods familiar to you on competition days. You may experiment with different foods on practice days to see how they will affect your performance.

