



FOOD POWER

for Athletes

Exercise is important for health, and healthful food helps you get the most from exercise. Poor eating habits and nutritional deficiencies can impair performance. Some general guidelines that each athlete, recreational or competitive, should follow when trying to maintain a favorable level of fitness are described below.

Dietary Balance

For body weight maintenance, energy in must equal energy out. Therefore, athletes who burn fuel to perform have to consume more calories. Low energy (calorie) intake for high-intensity exercise can result in loss of muscle mass, menstrual dysfunction, and loss of bone density.¹ Calories should come from a healthful selection of foods high in carbohydrates, low in fat, and adequate in protein.¹ Because of its high carbohydrate and low-fat content, a plant-based diet is an optimal sports diet.² It is also rich in vitamins, minerals, and antioxidants—important nutrients that help the body use energy and protect it from the stress of exercise.

carbohydrate needs for athletes are similar to those for anyone else (at least 55 percent of total daily intake of calories). Specific recommendations for athletes are based on weight and range from 6 to 10 grams per kilogram of body weight per day.¹ An abundance of evidence shows that carbohydrate availability boosts endurance and performance.³ Whole grains, fruits, and vegetables are excellent sources of carbohydrates.



Carbohydrates

In general, carbohydrates are the primary fuel utilized during high-intensity exercise. On a per-calorie basis,

Depending on how strenuous the exercise, carbohydrates should be consumed during recovery, between 30 minutes and two hours post activity, when carbohydrate (glycogen) synthesis is at its maximum. Carbohydrate-rich foods with a moderate to high glycemic index provide a readily available source for glycogen production.⁴

Overall, a high-carbohydrate diet is most important in ensuring optimal storage of carbohydrates in the body, which fuel the body for exercise and support performance in both the endurance⁵ and strength athlete.^{6,7} A plant-based diet, which emphasizes whole grains, fruits, vegetables, and legumes, provides the high-carbohydrate content to fuel the body through training sessions and competition.

Fat

The key point about fats is that animal fats are high in saturated fat and should be avoided. High-fat diets are not recommended for athletes.

Protein

Protein, composed of chains of molecules called amino acids, plays an important role in the building, maintenance, and repair of the tissues of the body, including muscle. There are 20 different amino acids in the foods we eat, but our bodies can make only 11 of them. The nine essential amino acids that cannot be produced by the body must be obtained from the diet. A diet based on a variety of grains, legumes, and vegetables easily provides all of the essential amino acids. It was once thought that various plant foods had to be eaten together to get their full protein value, a method known as “protein combining,” or “complementing.” We now know that intentional combining is not necessary to obtain all of the essential amino acids.⁸

Plant-based protein sources are best because, unlike animal sources, they can contain fiber (a blood sugar balancer and intestinal scrub brush) and complex carbohydrates. Concentrated protein sources are not needed. However, abundant protein is found in tofu, soy milk, tempeh, seitan, and various meat analogues.

Protein requirements are very individualized and are primarily dependent on body size. The recommended dietary allowance (RDA) for the average, sedentary or lightly active adult is 0.8 grams per kilogram of body weight per day.⁹ For most people, this is more than enough. However, some authorities believe that protein needs for athletes may range from 1.2 to 1.7 grams per kilogram of body weight per day for the highly active adult athlete.¹

Compared with carbohydrate and fat, protein is used only minimally for fuel,¹⁰ as its primary function is building and

maintaining the tissues of the body. Since meat has no fiber, it can make an athlete feel constipated, “weighed down,” and sluggish, making it a less-than-ideal source for fuel.

For Athletes Looking for Extra Protein

- Top salads with a variety of beans, including chickpeas, kidney beans, great northern beans, and black beans. These legumes have as much as 7 to 10 grams of protein per serving.



- Shake it up! Blend nondairy milks or soft tofu with your favorite fresh or frozen fruits for a thick, delicious, creamy high-protein shake.
- Marinated tempeh or veggie burgers, grilled on a bun or added to pasta sauce, offer a quick protein boost to any meal.
- On the go? Nutrition bars and soy powder shakes are quick and convenient supplements that can help increase the protein content of any well-balanced vegetarian diet.

Water

Maintaining optimal hydration status is important in promoting peak performance and preventing injuries. Dehydration, defined as body weight loss of 1 percent or more because of fluid loss,

results in a number of symptoms, including headache, fatigue, heat intolerance, and dark urine with a strong odor. More serious effects include neuromuscular fatigue,¹¹ heat cramps, heat exhaustion, and heat stroke.¹² By maintaining a regular fluid schedule of at least eight 8-ounce glasses of water per day, these symptoms are easily prevented.¹² Fluid needs increase with exercise. Additionally, participating in activity at high altitudes, low humidity, and high temperatures can also increase fluid needs.¹²

The following guidelines can help you stay hydrated:^{1,13}

- Two hours before exercise: Drink 14 to 20 ounces (or about 2 cups) of fluid.
- During exercise: Drink 5 to 12 ounces (or about 1 to 1 1/2 cups) of fluid every 15 to 20 minutes.
- After exercise: Drink 16 to 24 ounces (or about 2 to 3 cups) of fluid for every pound lost during exercise; weighing yourself before and after exercise can help you determine your fluid loss.

Water is ideal as a fluid replacer, particularly for activities lasting less than one hour. For those activities lasting more than 60 to 90 minutes, sports drinks containing carbohydrates or electrolytes may be useful both during and following exercise.^{13,14} Electrolytes and carbohydrates can also be easily ingested through food, in addition to water, following a training session or event.

Putting It All Together

A plant-based diet, which emphasizes whole grains, fruits, vegetables, and legumes, provides the high-carbohydrate content balanced with the protein and fat the body needs for training sessions and competition. When these three nutrients are consumed from plant-based sources and in the recommended ratios, an athlete will get all the vitamins and minerals he or

she needs to best perform, recover, and perform again.

An optimal sports diet for performance, recovery, and health is found in the Power Plate—grains, vegetables, legumes, and fruits. By choosing generous servings of these nutrient-dense foods with a focus on variety and wholesomeness, your body will reap the benefits.

- **Whole grains:** Choose whole-grain breads, cereals, rice, and pastas. They are rich in complex carbohydrate, fiber, zinc, and B vitamins. A single serving also provides about 2 to 3 grams of protein.
- **Vegetables:** Choose a variety of colorful red, orange, and yellow vegetables in addition to leafy greens for vitamin C, beta-carotene, and other antioxidants that will protect your body from the stress of exercise. These foods also provide iron, calcium, fiber, and a modest 2 grams of protein per serving.
- **Legumes:** Choose a variety of beans (chickpeas, black beans, kidney beans, great northern beans), as well as soy milk, tofu, tempeh, and textured vegetable protein.



They are not only high in protein (about 7 to 10 grams per serving), but also rich in complex carbohydrates, fiber, iron, calcium, and B vitamins.

- **Fruits:** Choose a variety of fruits and fruit juices for extra vitamins, especially vitamin C. By choosing fruits of different colors, you can ensure a variety of vitamins and minerals.

- **Vitamin B12 supplement:** A multivitamin mineral supplement or vitamin B12 supplement can be taken daily or every other day to cover nutritional needs. Fortified foods, such as fortified breakfast cereals or fortified soy and rice milks, may also contain the active form of vitamin B12, cyanocobalamin.

References

1. Rodriguez NR, Dimarco NM, Langley S. Position of the American Dietetic Association, Dietitians of Canada, and the American College of Sports Medicine: Nutrition and athletic performance. *J Am Diet Assoc.* 2009;109:509-527.
2. Nieman DC. Vegetarian dietary practices and endurance performance. *Am J Clin Nutr.* 1988;48(3suppl):754-761.
3. Burke LM, Cox GR, Culmings NK, Desbrow B. Guidelines for daily carbohydrate intake: do athletes achieve them? *Sports Med.* 2001;31:267-299.
4. Burke LM, Kiens B, Ivy JL. Carbohydrates and fat for training and recovery. *J Sports Sci.* 2004;22:15-30.
5. Tarnopolsky MA, Gibala M, Jeukendrup AE, et al. Nutritional needs of elite endurance athletes. Part I: carbohydrate and fluid requirements. *Eur J Sport Sci.* 2005;5:3-14.
6. Haff GG, Lehmkuhl MJ, McCoy LB, Stone MH. Carbohydrate supplementation and resistance training. *J Strength Cond Res.* 2003;17:187-196.
7. Leveritt M, Abernethy PJ. Effects of carbohydrate restriction on strength performance. *J Strength Cond Res.* 1999;13:52-57.
8. Craig WJ, Mangels AR. Position of the American Dietetic Association: vegetarian diets. *J Am Diet Assoc.* 2009;109:1266-1282.
9. Food and Nutrition Board, Institute of Medicine. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids

(Macronutrients). Washington, DC: National Academy Press; 2005.

10. Liebman M, Wilkinson JG. Carbohydrate Metabolism and exercise. In: Wolinsky I, Hickson JF, eds. *Nutrition in Exercise and Sport.* 3rd ed. London: CRC Press; 1998.
11. Vallier JM, Grego F, Basset F, Lepers R, Bernard T, Brisswalter J. Effect of fluid ingestion on neuromuscular function during prolonged cycling exercise. *Br J Sports Med.* 2005;39:e17.
12. Kleiner SM. Water: an essential but overlooked nutrient. *J Amer Diet Assoc.* 1999;99:200-206.
13. Sawka MN, Burke LM, Eichner ER, et al. American College of Sports Medicine position stand. Exercise and fluid replacement. *Med Sci Sports Exerc.* 2007;39:377
14. Puhl SM, Buskirk ER. Nutrient beverages for exercise and sport. In: Wolinsky I, Hickson JF, eds. *Nutrition in Exercise and Sport.* 3rd ed. London: CRC Press; 1998.





power food
RECIPES

Plant-based foods fuel athletic performance, aid recovery, and boost overall health!



ENERGIZING SMOOTHIE BOWL

Makes 3 Servings

INGREDIENTS

Frozen blueberries (1 1/2 cups)
 Frozen raspberries (1 cup)
 Sliced frozen or room-temperate overripe banana (1 cup)
 Baby spinach leaves (2 cups)
 Orange juice (1 tbsp.)
 Vegan vanilla protein powder (2-3 tbsp.), optional
 Water or nondairy milk (for a creamy texture) (1 cup + 2-3 tbsp.)
 Sliced ripe banana (1/2 cup)
 Seasonal fruit, such as sliced kiwi, sliced strawberries, Chopped pear, or clementine segments (1/2 cup)

DIRECTIONS

1. In a blender, combine the blueberries, raspberries, banana, spinach, juice, protein powder (if using), and 1 cup of the water or milk, and puree.
2. Add the remaining water or milk 1 tablespoon at a time if needed to thin, but only add as much as is needed to be able to blend, so the mixture stays very thick.
3. Divide among 3 bowls and top with the banana and seasonal fruit.

NUTRITION FACTS

Per Serving (1/3 of recipe)
 Calories: 275
 Fat: 2 g
 Calories from Fat: 7%
 Protein: 5 g
 Carbohydrates: 67 g
 Sugar: 37 g
 Fiber: 15 g
 Sodium: 24 mg



TOFU PROTEIN SCRAMBLE

Makes 4 Servings

INGREDIENTS

Tofu, extra firm (light or low-fat when possible) (14-16 ounces)
 Garlic, minced (1 clove)
 Onion, diced (1/2 cup)
 Green pepper, diced (1/2 cup)
 Red pepper, diced (1/2 cup)
 Mushrooms, chopped (3/4 cup)
 Turmeric powder (1/4 teaspoon)
 Cumin powder (1 teaspoon)
 Black pepper (3/4 teaspoon)
 Salt (1 teaspoon)

DIRECTIONS

1. Add 1/4 cup water to large sauté pan. Once heated, add onion.
2. When the aroma releases from the onion and it starts to become translucent, add garlic. Cook for 2 minutes, add peppers and mushrooms and add 1/4 cup water if vegetables are sticking to the pan. Cook for about 4 minutes or until vegetables are tender.
3. Crumble tofu with hands and add to pan along with turmeric, mixing well. Add cumin powder, pepper, and salt, and cook for another 4-6 minutes until everything is cooked through.
4. Serve with whole grain toast or on a warm corn tortilla.

NUTRITION FACTS

Per Serving
 Calories: 121
 Protein: 10.4g
 Carbohydrate: 10.6g
 Sugar: 2.8g
 Total fat: 5.3g
 Calories from fat: 36.6%
 Fiber: 4.7g
 Sodium: 594mg



LEAN GREEN RECOVERY SMOOTHIE

Makes 5 Servings

INGREDIENTS

Orange, peeled (1)
Grapes (1 cup)
Banana (1)
Pear, cored (1)
Soy, almond, or rice milk (1 cup)
Fresh kale or spinach (2 cups)
Ice cubes (your preference), optional

DIRECTIONS

1. Place all ingredients in the blender for 1 minute, or until desired smoothness is achieved.
2. Add ice cubes, if using, and process further to desired temperature.

NUTRITION FACTS

Per 1-cup serving
Calories: 110
Fat: 1.1 g
 Saturated Fat: 0.2 g
 Calories from Fat: 8.5%
Cholesterol: 0 mg
Protein: 3.1 g
Carbohydrates: 24.5 g
Sugar: 14.9 g
Fiber: 3.8 g
Sodium: 36 mg
Calcium: 99 mg
Iron: 1 mg
Vitamin C: 33.1 mg
Beta-Carotene: 2,464 mcg
Vitamin E: 1.2 mg



ON-THE-GO GRANOLA

Makes 6 Servings

INGREDIENTS

Rolled oats (3 cups)
Wheat germ (1 cup)
Chopped walnuts (1/2 cup)
Raisins (1/2 cup)
Dried cranberries (1/2 cup)
Sesame seeds (1/4 cup)
Maple syrup (1/4 cup)
Molasses (2 tbsp.)
Cinnamon (1 tsp.)

DIRECTIONS

1. Preheat oven to 300 F.
2. Combine all ingredients in a large bowl and mix thoroughly. Transfer to a 9- x 13-inch baking dish.
3. Bake, turning often with a spatula, until mixture is golden brown, about 25 minutes.

NUTRITION FACTS

Per 1/2-cup serving
Calories: 231
Protein: 7 g
 Calories from protein: 11%
Carbohydrate: 39 g
 Calories from carbohydrates: 66%
Fat: 6.5 g
 Calories from fats: 23%
Fiber: 2.5 g
Sodium: 5 mg



DR. LOOMIS' RECOVERY SMOOTHIE

Makes 1 Serving

INGREDIENTS

Tart cherry juice (2 cups)
Chopped kale leaves (fresh or frozen) (1 cup)
Medium-sized beet (1)
Frozen banana (1)
Blueberries (1/2 cup)
Cinnamon (1 tsp.)
Ginger (1 tsp.)
Turmeric (1 tsp.)
Chia seeds (2 tbsp.)
Maca powder (1 tbsp.)
A pinch of freshly ground black pepper

DIRECTIONS

1. Put all of the ingredients in a blender and process until smooth. Add a bit more cherry juice if the smoothie is too thick.

NUTRITION FACTS

Per Serving
Calories: 580
Fat: 7 g
Calories from Fat: 11%
Protein: 9 g
Carbohydrates: 131 g
Sugar: 94 g
Fiber: 20 g
Sodium: 112 mg



QUINOA SUPER SALAD

Makes 2 Servings

INGREDIENTS

Salsa verde (3/4 cup)
Apple cider vinegar (2 tsp.)
Small tomato, diced (1)
Yellow squash, diced (1)
Green onions, sliced (4)
Napa cabbage, sliced (2 cups)
Corn (1/2 cup)
Cooked quinoa (1/2 cup)
Red beans, rinsed (1/2 cup)
Fresh oregano leaves, chopped (1 tsp.)

DIRECTIONS

1. Combine the salsa verde with the apple cider vinegar. Toss all the salad ingredients together.

NUTRITION FACTS

Per serving
Calories: 250
Protein: 11 g
Carbohydrate: 46 g
Sugar: 90 g
Fat: 3 g
Calories from Fat: 9%
Fiber: 12 g
Sodium: 180 mg



TEMPEH SLOPPY JOES

Makes 4 Servings

INGREDIENTS

Water, divided (1 cup)
 Onion, chopped (1 small)
 Green bell pepper, seeded and chopped (1)
 Tempeh, crumbled into small pieces (18-ounce package)
 Tomato sauce (18-ounce can)
 Ketchup (2 tbsp.)
 Agave nectar (1 tbsp.)
 Apple cider vinegar (1 tbsp.)
 Vegan Worcestershire sauce (1 tbsp.)
 Prepared mustard (2 tsp.)
 Garlic powder (1/2 tsp.)
 Multigrain hamburger buns (4)

DIRECTIONS

1. Heat 1/2 cup water in skillet. Add onion and bell pepper and sauté until cooked through.
2. Add remaining 1/2 cup water and tempeh. Sauté for 5 to 7 minutes, allowing the tempeh to get well-done.
3. Add tomato sauce, ketchup, agave nectar, vinegar, Worcestershire sauce, mustard, and garlic powder and cook for 15 minutes.
4. Serve on buns.

NUTRITION FACTS

Per serving
 Calories: 273
 Fat: 7.9 g
 Saturated Fat: 1.6 g
 Calories from Fat: 24.5%
 Cholesterol: 0 mg

Protein: 17.6 g
 Carbohydrates: 36.6 g
 Sugar: 14.4 g
 Fiber: 6.3 g
 Sodium: 666 mg
 Calcium: 143 mg
 Iron: 3.9 mg
 Vitamin C: 27.7 mg
 Beta-Carotene: 239 mcg
 Vitamin E: 1.5 mg



CARB-LOADED SWEET POTATO

Makes 4 Servings

INGREDIENTS

Medium sweet potatoes (4)
 Cooked black beans, or 1 (15-ounce) can black beans (2 cups)
 Salsa (1 cup)
 Chopped fresh cilantro (1/2 cup)
 Mashed avocado or dry-roasted pepitas (pumpkin seeds) (1/4 cup), optional

DIRECTIONS

1. Wash the sweet potatoes. Pierce each potato 4 to 5 times with a fork and bake in the oven or microwave.
2. Oven: Preheat the oven to 400°F. Place the potatoes on a rimmed baking sheet lined with foil or parchment paper. Bake 45 to 75 minutes, or until tender.

Microwave: Place the potatoes in a microwave-safe dish with 1/2 cup water. Cover loosely with a lid or plastic wrap. Microwave for 10 minutes. Carefully turn the potatoes over. Microwave another 10 to 12 minutes, or until the potatoes are tender.

3. Once cooked, split the potatoes and top each potato with black beans, salsa, cilantro, and mashed avocado

or pepitas, if using.

Note: Other tasting toppings include corn (fresh or thawed from frozen), chopped tomatoes, and sliced green onions.

NUTRITION FACTS

Per potato:

Calories: 235

Protein: 11 g

Carbohydrates: 48 g

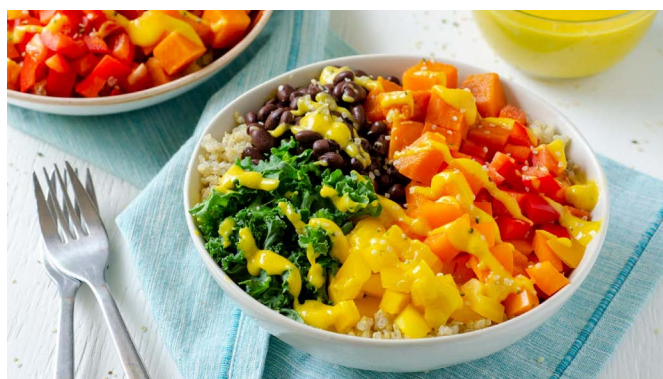
Sugar: 11 g

Fat: 1 g

Calories from Fat: 3%

Fiber: 13 g

Sodium: 503 mg



PLANT-POWERED BOWL

Makes 3 Servings

INGREDIENTS

Cooked quinoa or brown rice, cold or warm, as desired (2 cups)

Chopped kale leaves, raw or steamed, or baby spinach leaves (3 cups)

Cubed and cooked sweet potato (2 cups)

Black beans, rinsed and drained (1 15-ounce can)

Chopped bell pepper (1 cup)

Mango chunks, fresh or frozen (3/4 cup)

Hemp seeds (2 tbsp.)

Freshly squeezed lime juice or red wine vinegar (2 tbsp.)

Chopped shallots or 1 tbsp. of the white portion of a

Green onion (1/2 tbsp.)

Dijon mustard (1/2 tsp.)

Sea salt (1/2 tsp.)

Freshly ground black pepper (to taste)

Water, optional (1/4 cup + 2-3 tsp.)

Coconut nectar or pure maple syrup (1-2 tbsp.)

DIRECTIONS

1. In three bowls, arrange approximately equal amounts

of the quinoa or rice, kale or spinach, sweet potato, black beans, and bell pepper.

2. Drizzle on the dressing of your choice. **Note:** If using raw kale, it's useful to break it down by massaging it. After tearing the leaves from the stalk, sprinkle them with salt and use your hands to rub and "massage" them for a minute or two. Alternatively, you can steam the leaves for just a minute to soften.

3. In a blender, combine the mango, hemp, lime juice or vinegar, shallots or green onion, mustard, salt, pepper, 1/4 cup of the water, and 1 tablespoon of the nectar or syrup. Puree until very smooth.

4. Taste, and add the remaining 2 to 3 tablespoons water to thin (if desired) and the remaining 1 tablespoon nectar or syrup, to taste. If you'd like to pair this dressing with some spicy foods or add an extra punch of flavor, try adding 1 to 2 tablespoons of chopped cilantro or basil while pureeing.

NUTRITION FACTS

Per serving (bowl with mango-hemp dressing)

Calories: 407

Protein: 17 g

Carbohydrate: 79 g

Sugar: 11.8 g

Total Fat: 3.5 g

Calories from Fat: 7.5%

Fiber: 18 g

Sodium: 426 mg

Per 2-tablespoon serving (dressing only)

Calories: 31

Protein: 1 g

Carbohydrates: 5 g

Sugar: 4 g

Total Fat: 1 g

Calories from Fat: 28%

Fiber: 1 g

Sodium: 155 mg

Physicians
Committee
for Responsible Medicine
pcrm.org