



## Pre, During, Post Exercise Nutrition for Optimal Athletic Performance

### Finding the Right Balance

#### Carbohydrates

**Primary fuel** for our bodies during physical activity. Provide energy, spare protein, maintain blood glucose (fruits, vegetables, whole grains, dairy, beans)

#### Protein

Recommendations for endurance athletes range from **1.2 to 2.0 grams per kilogram per day**. Essential to maintain muscle mass, for tissue repair, and immune system (fish, meat, eggs, beans, soy, dairy, nuts)

#### Fat

Used at **lower intensities**. Used for protection, insulation, cell function, hormones (oil, butter, fish, avocados, nuts, dairy)

#### Vitamins & Minerals

**Calcium:** provides structure to bone and teeth. Important for nerve transmission, muscle contractions, blood pressure regulation, and release of hormones. Sources: dairy, tofu, leafy greens, fish canned with bones.

**Vitamin D:** important for bone health and immune health. Sources: liver, fatty fish, egg yolks.

**Iron:** delivery of oxygen to working muscles. Sources: red meat, fish, beans, beets, leafy greens, nuts.



### The Human Machine

#### Over the Course of 24 hours:

Heart beats 103,689 times  
Breathe 23,040 times  
Exercise 7,000,000 brain cells  
Speak 48,000 words  
Nails grow 0.0046"  
Perspire 1.43 pints of moisture.



Blood travels 168,000 miles  
Inhale 438 cubic feet of air  
Turn in your sleep 2530 times  
Move 750 major muscles  
Hair grows 0.1717"

### Pre - Exercise

- Digestion Time:
  - Large meal: 3-4 hours; 500-800 calories
  - Small meal: 2-3 hours; 300-400 calories
  - Small snack: <1 hour; 150-200 calories
- Stick to familiar foods
- **Carbohydrate** rich sources low in fiber and fat to reduce GI problems.
  - Oatmeal with milk and berries, sweet potatoes, brown rice, multigrain cereal with milk, whole wheat bread with PB, banana & PB, pasta with sauce, yogurt & granola
- **Hydrate:** 2-3 hours; 17-20oz. of fluid. 15-20min; 7-10oz.

### During Exercise

- **>90 minutes**, consume 100-250 calories per hour from **carbohydrates**
  - bananas, oranges, sports drinks, gels, applesauce.
- **Hydrate:** 5-10oz. of fluids every 15-20minutes for exercise **>60 minutes**
- **Electrolytes** -Na, K, Cl
- **Experiment** fueling and hydration during training

### Post Exercise

- **Similar to pre-workout snack** should be consumed within **30 minutes** after exercise.
- Carbohydrates and protein with a little fat.
  - fruit smoothie with yogurt or milk, bagel with PB, cereal with milk, spaghetti with meat sauce, turkey and ham sandwich, trail mix, energy bar.
- **Hydrate:** weigh before and after exercise, for **every pound loss drink 16-24 oz of extra fluid** within 2 hours.



## Homemade Sports Drink

- 1/4 cup sugar
- 1/4 tsp. salt
- 1/4 cup hot water
- 1/4 cup orange juice
- 2 tbs. lemon juice
- 3 1/2 cups cold water

In the bottom of pitcher, dissolve sugar and salt in hot water. Add juice and remaining cold water; chill.

## Nut Butter Energy Bars

- 3 cups oats
- 1 cup nut butter (peanut, almond, sunflower seed)
- 1/2 cup liquid sweetener (honey, maple syrup, agave)
- Optional: dried fruit, nuts, seeds, coconut

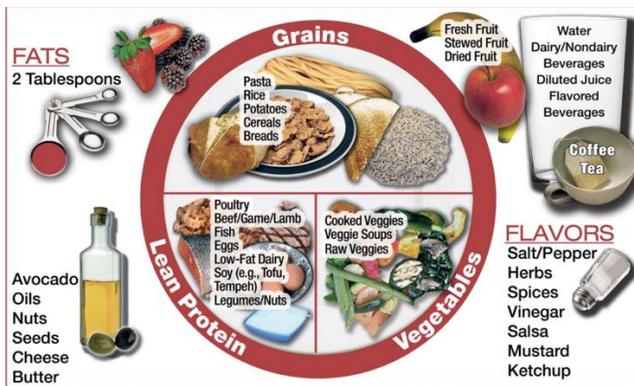
In microwave safe bowl, combine nut butter and honey. Microwave on high for 2 minutes. Pour nut butter mixture over oatmeal and stir until coated. Add optional ingredients if desired. Spoon mixture in 9x9 inch pan coated with cooking spray, press down firmly. Let stand for about an hour.



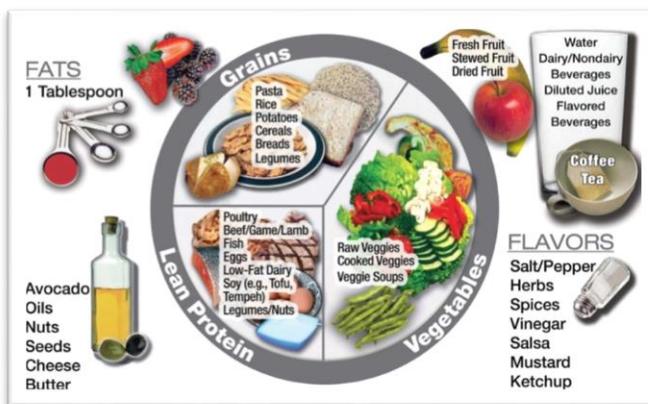
## How Much Food is Enough?

Find a Sports Dietitian in your area to help make an individualized program at [eatright.org/find-an-expert](http://eatright.org/find-an-expert).

### Hard Day/Competition Day



### Moderate Day (1 Workout)



(United States Olympic Committee Sport Dietitians)

## How Much Fluid is Enough?

- Women = ~12 cups
- Men = ~ 16 cups
- Urinate every **2-4 hours**, pale yellow urine.

Recommended Reading: *Nancy Clark's Sports Nutrition Guidebook*

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