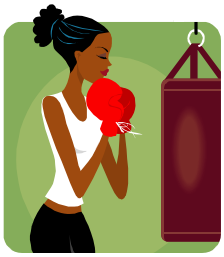
Fuel For Exercise



Pre-Exercise Energy

- A pre-event meal should consist of 50-100 grams of carbs at least 1 hour before exercise (3-4 hrs seems to be best).
- Generally **200-300 calories of carbs (50-75 grams)** 1-2 hours before exercise can enhance performance.
- If unable to consume snacks during exercise greater than 60-90 minutes, consume slowly digested carbs with a moderate to low glycemic effect. The following are suggested choices when eaten an hour before exercise to mix and match:
    - 8oz fruit yogurt ~43 g
    - 1 medium-large banana 30 g
    - 1 cup cooked oatmeal (1/2 cup dried) 30 g
    - 4oz cooked sweet potatoes 15 g
    - 1 medium apple 15 g
- If exercising less than one hour, high-carb and low-fat foods are best (such as):
    - 1 slice whole wheat bread 15 g
    - 1 whole wheat English muffin 30 g
    - 2oz whole wheat crackers 30 g
    - ½ cup whole wheat pasta 15 g

During Exercise Energy

After 1 hour of exercise, athletes begin to tire due to carb depletion. Thus, it is recommended to consume 30-60 grams (120-240 calories). Examples include:

- Four 8oz glasses (~ 1 liter) of a sports drink that contains 50 calories per 8oz
- Two cups of a sports drink and a banana
- An energy bar and water

Good sources of carbs to mix and match include:

- 1 c orange juice 25 g
- 1 c Gatorade 15 g
- Medium banana 27 g
- Apple 20 g
- ¾ oz raisins 15 g

**Any more than 30-60 grams per hour can hinder performance. Liquid and solids are equally effective.

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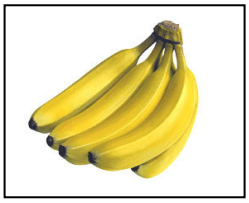
Post-Exercise Energy: Recovery Foods

- Goal: To replenish carb stores (glycogen) and replenish fluid loss so you are ready for the next day's workout or competition.
- After all muscle glycogen is depleted, it takes 20 hours for full recovery.
- Full recovery can only be achieved if carb intake is 0.5 grams of carb per pound of body weight every hour. This should be taken at 30-minute intervals for 4-5 hours. Thus, a 150 lb athlete would need 75 g of carb, which equals 300 calories (1 g of carb is equal to 4 calories).
- Type of carb consumed affects glycogen synthesis. Thus, foods with high glycemic index (glucose) refuel muscles better than fructose. Carb rich foods that have about 300 calories include:
  - 8 oz of orange juice and a medium whole wheat bagel
  - 16 oz of cranberry juice
  - 8 oz of fruit yogurt
  - One bowl of corn flakes with milk and a banana



- Other good sources of carbs to mix and match include:
  - ½ cup Spaghetti 15 g
  - 1 slice of a 14" veggie pizza ~35 g
  - 1 small-medium whole fruit 15 g
  - 1/3 cup brown rice 15 g
  - 3 oz cooked potato 15 g
  - 2 large rectangular graham cracker squares 22 g
  - 1 cup low fat chocolate milk 26 g
- It is important to get protein sources to help enhance glycogen replacement and build/repair muscles in the initial hours after exercise. At least 20 grams of protein are needed and can be combined with carb rich foods. Lean sources of protein to consume include:
  - 3oz grilled chicken breast 21 g
  - 3oz salmon 21 g
  - 4 large egg white 14 g
  - 3oz lean beef 21 g
  - ½ cup low fat Cottage Cheese 14 g
  - 4 oz fat free Greek yogurt 14 g
  - 3oz of turkey breast 21 g
  - 1 cups fat-free or 1% milk 8 g

Fluids for Exercise

- Fluids adequate to prevent dehydration: 2350-2825 mL/day (80-96 oz/day)
- An additional 400-600 mL pre-exercise
- 200-400 mL every 15-20 min during exercise
- 700 mL post-exercise

References:

- Clark, Nancy. Sports Nutrition Guidebook, 3rd edition. 2003.
- Plowman, Sharon and Smith, Denise. Exercise Physiology for Health, Fitness, and Performance, 2nd edition. 2003.

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