

# Nutrition

## Fact Sheet

### Fueling the School-Aged Athlete – What to Eat During and After Exercise

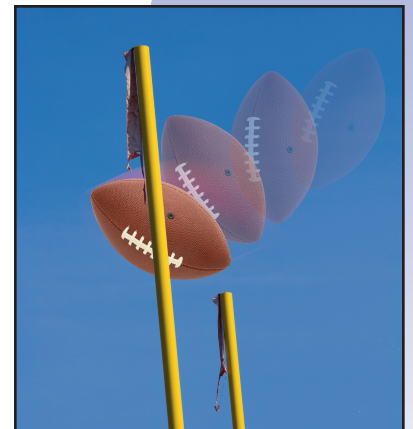
Consuming meals and snacks throughout the day helps school-aged athletes satisfy their energy and nutrient needs. Depending on the athletic activity, some school-aged athletes may eat or drink while exercising to meet these needs. Eating after exercise or between competitions is also important for replenishing energy and nutrient stores.

#### During Exercise

Most research on fluid and fuel intake during exercise centers on adult athletes. However, some initial research with adolescent athletes has shown that consuming carbohydrates in the form of a sport drink during the sporting event improved performance (Horswill, Curby, & Murray, 1999; Odland & Johnson, 2002). One study found no difference in physiological response or performance when adolescent cyclists were given either plain water or a carbohydrate drink (Montfort-Steiger & Williams, 2007). Performance benefits of eating carbohydrates during exercise are unclear for school-aged athletes. Nevertheless, because performance was enhanced from carbohydrate intake for some school-aged athletes, the individual athlete's response should be considered.

#### Goals of Eating or Drinking During Exercise

- Maintain hydration.
- Provide a source of carbohydrate to maintain blood glucose for the duration of exercise.
- Sustain energy level.



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A snack during exercise may be appropriate in situations of long duration (more than 90 minutes) and high-intensity (to exhaustion). Some benefits have been shown by consuming carbohydrates every hour as solid food or drink for long events (American Dietetic Association [ADA], 2009; McArdle, Katch, & Katch, 2008). For adult athletes, consuming about 30–60 grams of carbohydrate per hour extends performance in endurance events (ADA, 2009; McArdle et al., 2008).

For sports like basketball and soccer, carbohydrate intake during exercise was associated with ability to perform the activity longer (Nicholas, Tsintzas, Boobis, & Williams, 1999; Odland & Johnson, 2002). More research is needed to confirm the performance benefits of consuming carbohydrates and fluids during exercise in school-aged athletes, especially during intermittent, high intensity efforts in stop-and-go sports (Petrie, Stover, & Horswill, 2004).

## During Exercise Food Suggestions

- Bananas
- Orange slices
- Raisins
- Dry cereal
- Crackers
- Bread
- Granola bar
- Diluted fruit juice
- Home-made or commercial sports drinks
- Sports bar or gel
- Water



## Home-Made Carbohydrate Drink

- |                    |                           |
|--------------------|---------------------------|
| ¼ cup sugar        | 2 tablespoons lemon juice |
| ½ cup hot water    | ¼ teaspoon salt           |
| ¼ cup orange juice | 3 ¼ cups cold water       |

1. In a quart jar or pitcher, dissolve the sugar in the hot water.
2. Add the remaining ingredients and stir.
3. Chill.

Yield: 4 cups. Nutrients per 1 cup serving: 50 calories, 12 grams carbohydrate, 110 mg sodium, 4.8% carbohydrate

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## Post-Exercise Meal

The role of the post-exercise meal is to provide food and fluid for recovery and also to replenish carbohydrate stores. Athletes should select foods and fluids wisely right after exercising and also throughout the day to recover and refuel for the next workout.

## Goals of a Post-Exercise Meal

- Replenish calories.
- Replenish electrolytes.
- Replenish fluids.
- Replenish muscle glycogen stores.
- Provide nutrients to promote muscle growth and tissue repair.



Most of the post-exercise nutrition research also focuses on adult athletes. The intensity, duration, and length of time until the next exercise session influence the timing and composition of the post-exercise meal (ADA, 2009). Athletes who exercise intensely and work out several times a day need to replenish the carbohydrate used for energy by restoring muscle glycogen. Consuming carbohydrates immediately after exercise increases glycogen synthesis and rapidly replenishes glycogen stores (Stout, 2007).

Including some protein in post-exercise meals and snacks has been recommended to help repair tissue and promote factors that help build new muscle (Tipton & Wolfe, 2004). For school-aged athletes, team sports that involve intense activity that is repeated throughout the event require replacement of fluids and adequate energy intake to prevent fatigue and nutrition to promote recovery and maintenance of muscle that is essential for power, speed, and strength (Pietre et al., 2004).

## Post-Exercise Snacks and Meals

There is no evidence to suggest that post-exercise meal recommendations for adults would not be similar for school-aged athletes (Habash, 2006). However, any athlete needs to modify the general recommendations to meet individual training needs, body size, energy expenditure, type of activity, performance outcome, appetite, and tolerance of post-exercise food. General guidelines include

- Replenish fluids lost from sweating by scheduled drinking during the event, and drink 2 cups (16 oz.) of water for every pound of body weight lost (McArdle et al., 2008).
- Meals and snacks should be consumed within 30 minutes after exercise to promote muscle synthesis (Tipton et al., 2001).



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- Choose nutrient-rich carbohydrate foods and a good source of protein (Burke, Keins, & Ivy, 2004).
- For adult athletes repeating exercise within 4–6 hours, eat 0.5 grams of carbohydrate per pound of body weight every hour, at 30 minute intervals for 4–5 hours or until a meal is consumed (Clark, 2008).
- Begin eating carbohydrates as soon as practical after the first workout to maximize effective recovery time between sessions (Burke et al., 2004).
- For longer recovery periods (24 hours), plan carbohydrate-rich meals and snacks on a schedule that is practical and comfortable for the individual situation (Burke et al., 2004).
- Liquid or solid simple carbohydrates are rapidly absorbed and glycogen synthesis is the same regardless of the form (Burke et al., 2004).

## Post-Exercise Meal and Snack Suggestions

- Lowfat chocolate milk
- Banana with small amount of peanut butter
- Bagel and tuna fish
- Cornflakes with raisins and lowfat milk
- Lowfat yogurt and granola
- Graham cracker and lowfat string cheese
- Lowfat pudding and animal crackers
- Hummus on pita bread and vegetable juice
- Fruit smoothie and pretzels
- Orange juice, scrambled eggs, and toast
- Peanut butter sandwich and lowfat milk
- Turkey and cheese sandwich with lettuce and tomato and lowfat milk
- Vegetable pizza, carrot sticks, and cran-apple juice
- Chicken noodle soup, crackers, and lowfat milk
- Baked potato topped with lean ham and lowfat cheese, and pineapple juice

**Every athlete can develop a plan for eating and drinking during and after exercise that best meets individual needs. Eating a combination of protein and carbohydrate after exercise may speed up the recovery process. Drinking during and after exercise may be needed for rehydration.**



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## For More Information

American Dietetic Association. [www.eatright.org](http://www.eatright.org)

BAM! Body and Mind. [www.bam.gov](http://www.bam.gov)

CDC Fruits and Veggies – More Matter (Centers for Disease Control and Prevention, HHS, NCI). [www.fruitsandveggiesmatter.gov/](http://www.fruitsandveggiesmatter.gov/)

MyPyramid for Kids. [www.mypyramid.gov](http://www.mypyramid.gov)

SCAN–Sports, Cardiovascular, and Wellness Nutritionists – A Practice Group of the American Dietetic Association. [www.scandpg.org](http://www.scandpg.org)

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- Tipton, K. D., & Wolfe, R. R. (2004). Protein and amino acids. *Journal of Sports Sciences*, 22, 65-79.

**For more information, contact NFSMI at 800-321-3054 or [www.nfsmi.org](http://www.nfsmi.org).**

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