

# Sports Nutrition Handbook

**VCS Athletic Department**



Developed by: Angie Palomaki, RD  
Updated: 11/2012

# Preface

As a Victor graduate and former Victor athlete, I only have positive memories of the educational and athletic programs. As I continued my education to become a dietitian and learned more about nutrition; I found that what I was learning was a piece of everyday life that seemed to be lacking in my previous education.

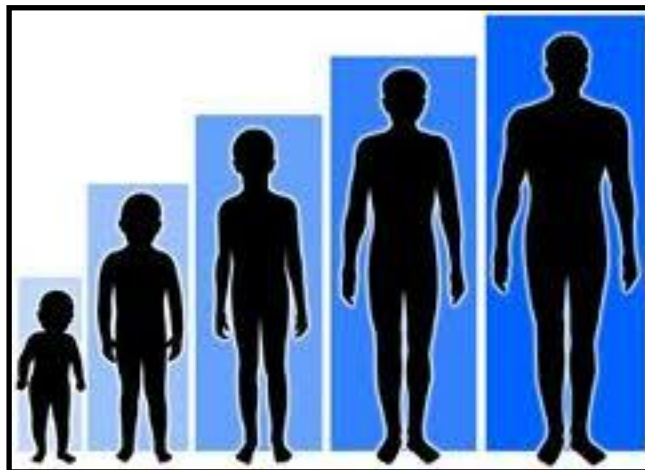
I was a competitive swimmer from the age of 9 and I swam year round from then until my senior year in college. But it wasn't until I started taking nutrition classes in college that I made the connection between my diet and the profound effect it had on my sports performance and overall health. As I changed my eating habits, my swimming times dropped drastically. It allowed me to reach goals I had put in place years before and I am still a record-holder at RIT! Other athletes have come to this conclusion as well. During the recent 2012 Olympics Ryan Lochte stated this: "Honestly, I would have to say, sports nutrition [is important] and how it impacts my performance. I wasn't really big into nutrition before, but [it] taught me that what I put into my body is as important as my cap and goggles every day." Although Victor athletics have excelled throughout the years, it seems clear now more than ever that through nutrition education and improved nutritional intake we can enhance our school's success and competitive edge in sports.

My interest in nutrition took me to RIT, where I completed my Bachelor's degree in Nutrition Management. From there, I completed my dietetic internship at Brigham and Women's Hospital in Boston, Massachusetts, an affiliate of Harvard Medical School. I returned to Rochester to complete the Leadership Education in Adolescent Health (LEAH) fellowship at The University of Rochester Medical Center, which led me to complete this project for Victor Central Schools.

# Nutrition Needs for Teens

Adolescence is a time of extremely rapid growth requiring increased energy and nutrient needs. Total nutrient needs are highest during adolescence compared to any other time in the lifecycle, except during pregnancy and lactation. It is imperative that nutrient needs be met during this time in order to reach maximum growth potential, avoid nutrient deficiencies, and to prevent illnesses. Inadequate intake due to a combination of elevated nutrient needs and poor eating habits place many adolescents at risk for nutrition problems.

Eating healthy during adolescence is essential. During this time nutrition is not only important to facilitate appropriate growth, it is also important in establishing lifelong habits. 50% of adult weight and 20% of adult height are achieved during the teenage years. It is also a critical period for bone development, during which half of the skeletal mass is developed. Adolescent obesity has also been on the rise and if a person is overweight as a teen, is he or she will most likely be obese as an adult. Clearly, forming healthy eating habits during adolescence is critical to long term health.



The first step to healthy eating is knowing what your nutrient needs are. There are a variety of resources that provide information on the nutrient needs for teenagers. The Dietary Reference Intake Reports (DRIs) provide specific information on nutrient needs based on age and sex. The DRIs were developed by the Institute of Medicine's Food and Nutrition Board and contain three categories: the Recommended Dietary Allowance (RDA), Adequate Intakes (AI), and Upper Limits (UL) for energy and nutrients. The RDA and AI represent a level of nutrient intake that would meet the needs of approximately 98% of the population based on age and sex. The UL is a level set that represents the highest recommended intake of a nutrient above which risks of side effects increase. The Percent Daily Value (%DV), found on food labels, is a guide to the nutrients in a serving of food. They can be used to choose foods high in vitamins and minerals and to limit foods high in fat, cholesterol and sodium. The Dietary Guidelines in conjunction with [choosemyplate.gov](http://choosemyplate.gov) are general recommendations for the public regarding the foods to eat for a healthy diet. These guidelines also provide specific recommendations for teens.

Appendix A provides nutrient goals for age-gender groups based on the DRIs and links to the Dietary Guideline and [choosemyplate.gov](http://choosemyplate.gov). Because adolescents go through growth spurts at various times and physical activity levels vary widely, it is difficult to accurately estimate caloric needs for teens. Below, Table 1 shows recommended caloric and protein allowances for teenagers based on national averages. Table 2 shows energy needs for teenagers through the spectrum of physical activity levels. Extremely active teens in endurance sports may require additional calories beyond the ranges listed in the table. Weight is probably the best indicator of adequate calorie intake in those athletes.

**Table 1: Recommended Dietary Allowances for Calories and Protein**

AGE (YEARS)	KCAL (ENERGY/D)	PROTEIN (G/D)
<u>MALES</u>		
9-13	2279	34
14-18	3152	52
<u>FEMALES</u>		
9-13	2071	34
14-18	2368	46

Source: Data from reports from the Institute of Medicine, Food and Nutrition Board, Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, 3-7© by the National Academy of Sciences, courtesy of the National Academies Press, Washington DC. (<http://www.nap.edu/>)

**Table 2: Recommended Dietary Allowances for Calories based on Physical Activity Level**

AGE (YEARS)	PHYSICAL ACTIVITY LEVEL		
	<u>SEDENTARY</u>	<u>MODERATE</u>	<u>ACTIVE</u>
<u>MALES</u>			
9-13	1600-2000	1800-2200	2000-2600
14-18	2000-2400	2400-2800	2800-3200
<u>FEMALES</u>			
9-13	1400-1600	1600-2000	1800-2200
14-18	1600-2000	1800-2200	2200-2600

Source: USDA's Dietary Guidelines for Americans 2010.

# Common Nutrition Concerns in Teens

Poor nutritional status is common in adolescents due to the combination of increased nutrient needs and increased independence in food choices. According to the Center for Disease Control (CDC), most US teens do not meet recommendations for fruit and vegetable intake, whole grain intake, and exceed the recommended sodium intake. Common behaviors that result in a diminished diet quality include: skipping meals, following “fad diets”, consuming foods and beverages high in fat or sugar and eating fast foods. All of these can result in low intake of micronutrients (vitamins and minerals), specifically iron and calcium. As you read through this section, think about how these can affect the athletes on your team. What sort of recommendations can you make to avoid them?

## Calcium

Calcium is the most abundant mineral in the body. 99% of the calcium in the body is found in the bones and teeth, and 1% in blood and body fluids. As mentioned before, adolescence is a critical period for bone development and growth, which means that calcium is an incredibly important nutrient in teenage years. Bone is a living tissue that changes constantly. Old bone is constantly being broken down and replaced by new bone tissue, of which calcium is the principle mineral. Bones are similar to banks in that calcium can be deposited or withdrawn. In adolescence, much more calcium is being deposited than withdrawn, thus leading to bone growth. Maximum bone density is reached by the age of 30 for both men and women. It is known that higher bone density achieved in adolescence will directly lower the risk for developing osteoporosis later in life. The DRI for calcium for both males and females aged 9-18 is 1300mg daily. For reference, an 8 oz glass of milk, one of the

best sources of calcium in the diet, contains about 300mg of calcium. Therefore, approximately 4 glasses of milk would be needed daily to meet this requirement. Unfortunately for a variety of reasons, milk consumption decreases greatly in adolescence. Adolescents consume more full-calorie soda per day than milk. On average, teen males consume 22 ounces of soda per day and 10 ounces of milk. Females drink an average of 14 ounces of soda and only 6 ounces of milk. The National Dairy Council shows in Table 3 that all populations (besides children aged 2-3) fail to meet the recommended intake of dairy.

**Table 3: Average Daily Servings of Dairy Compared With Recommended Intakes**

	2010 Dietary Guidelines	Total Dairy Servings
	(cup equivalent servings/day)*	
<b>Population</b>		
2 yrs and older	-	1.7
9 yrs and older	3	1.6
<b>Children</b>		
2-3 yrs	2	2.4
4-8 yrs	2.5	2.0
9-18 yrs	3	2.1
<b>Adults</b>		
19+ yrs	3	1.5
19-50 yrs	3	1.6
>50 yrs	3	1.4

\*Cup equivalent servings: 1 cup of milk or yogurt, 1.5 oz natural cheese or 2 oz processed cheese. Includes dairy in food mixtures made with dairy (e.g. smoothies, sauces, sandwiches, pizza).

There is no blood test to determine if a person is consuming enough calcium in their diet. Blood calcium is necessary for the heart to beat, as well as nerve transmission and muscle functioning. However, only the 1% of calcium in the blood is required for these functions. Since the regulation of blood calcium levels is very controlled and linked to vital functions, fluctuations in the blood calcium levels are not affected by dietary intake of calcium. The calcium in bones acts as a storage of

calcium to always maintain appropriate concentrations of calcium in the blood. If serum levels are low, the body will leech calcium stores from the bones to normalize the level. Therefore, only if intake of dietary calcium and blood calcium levels are both adequate, can calcium be deposited in the bones.

The most common contributors to low calcium intake in teens are:

- consumption of soft drinks as opposed to milk or other good sources of calcium at meals
- dislike for the taste of milk
- perception that dairy products are fattening
- lactose intolerance or milk allergy

Pre and post competition meals/snacks are perfect opportunities to consume calcium rich foods and coaches are perfectly positioned to encourage intake of these high calcium foods to maintain bone health. Milk, yogurt and cheese are excellent pre- or post-competition snacks. If families and teens elect not to consume dairy products, there are many other options for non-dairy sources of calcium to consider, such as fortified cereals, soy beverages, fortified orange juice, salmon, and dark, leafy green vegetable. Appendix B provides sources of dietary calcium.

## Iron

Iron is a trace mineral required in small amounts by the body. However, the importance of iron for body functioning is high. Iron forms part of the protein hemoglobin, which carries oxygen from the lungs to the rest of the body. Iron is especially important for athletics because it helps the muscles use and store oxygen.

Iron deficiency is the most common deficiency in both the developing and industrialized countries. If left untreated, iron deficiency progresses to anemia, which results in less oxygen being carried to cells. Females are 10 times more likely to develop iron deficiency than males in



adolescence. In addition to menstruating females, individuals most at risk for developing iron deficiency are vegans and vegetarians. According to the Center for Disease Control (CDC), 9% of teenage females in the United States have iron deficiency. Individuals who participate in regular, intense exercise are also at risk for having inadequate iron stores. The physiological explanation is unknown, but the need for increased iron is nearly 30% higher in those who participate in regular exercise. Athletes at greatest risk for developing iron deficiency are female athletes, distance runners, and vegetarians. Iron deficiency definitely has an impact on athletic performance. Some common symptoms include reduced physical work capacity, lowered immunity, weakness and fatigue, impaired cognitive functions, increased distractibility, and inability to regulate body temperature.

**Table 4: DRI for Iron**

Males aged 9-13	8 mg iron daily
Males aged 14-18	11 mg iron daily
Females aged 9-13	8 mg iron daily
Females aged 14-18	15 mg iron daily

Table 4 shows the recommendations of daily iron intake for male and female teens. There are two forms of iron available in the diet: heme iron and non-heme iron. Heme iron is more readily used by the body and comes from animal products such as meats, eggs, fish, and shellfish. Non-heme iron is a plant-based iron and is found in foods such as fortified cereals, dark leafy greens, and beans. Most iron consumed by Americans is non-heme iron. Non-heme iron is best absorbed when combined with a food source of vitamin C or with a source of heme iron. Good sources of dietary vitamin C are any citrus fruit, red and green bell peppers, cantaloupe, and kiwi. Because vegetarians do not consume heme iron, additional iron is recommended on a daily basis. Appendix C shows a table of the foods supplying the highest levels of iron.

## Consumption of Empty Calories in Teens

Teenagers are notorious for their consumption of “junk food”. Not all teens eat this way, although a large percentage does. The National Health and Nutrition Examination Survey (NHANES) of 2003-04 shows that nearly 40% of total calories consumed by teenagers are empty calories. Empty calories are defined as foods that consist of solid fats or added sugars that provide little to no nutritional value besides calories. The survey showed that on a daily basis, teenagers ate on average 433 calories from solid fats and 365 calories from added sugars.

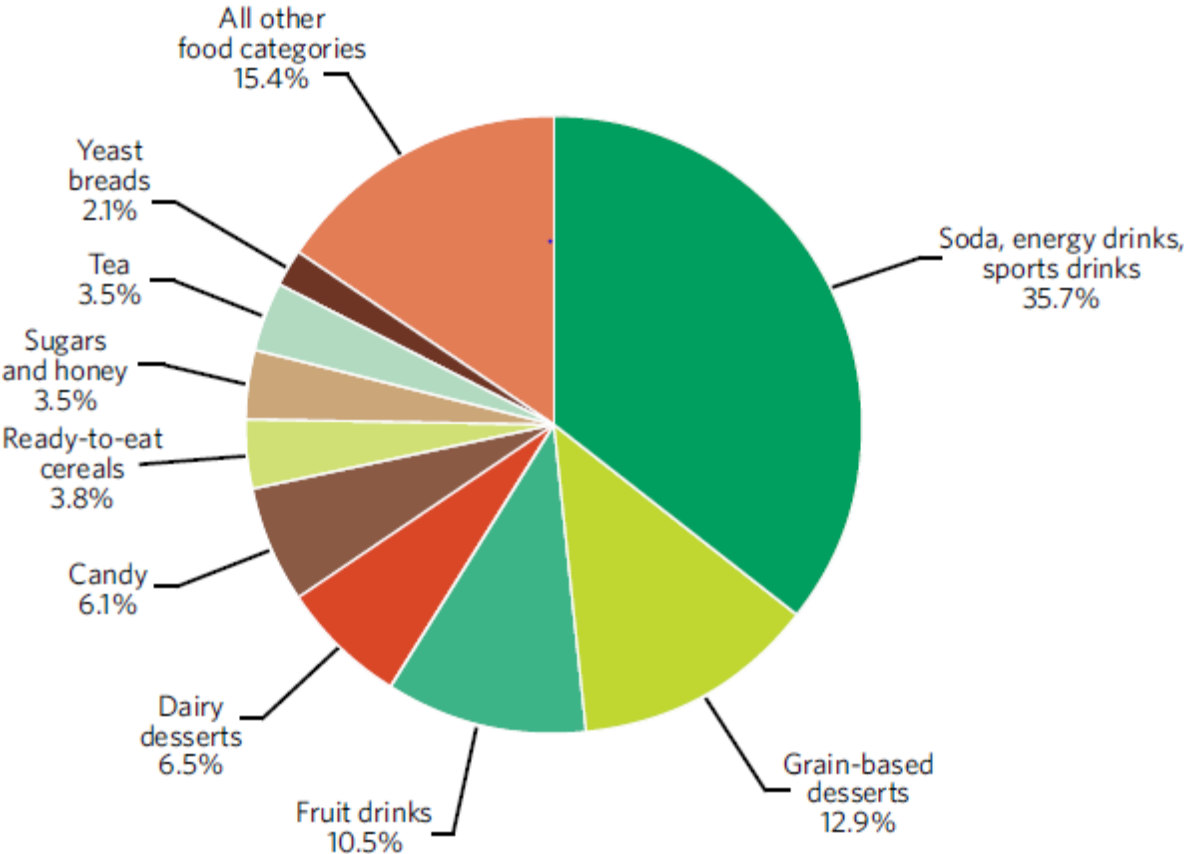
### Top Sources of Energy Among US Children

	All Persons, 2-18 years
1. Grain-based desserts	138 kcal/day
2. Pizza	136 kcal/day
3. Soda/energy/sports drinks	118 kcal/day
4. Yeast breads	114 kcal/day
5. Chicken dishes	113 kcal/day
6. Pasta and pasta dishes	91 kcal/day
7. Reduced-fat milk	86 kcal/day
8. Dairy desserts	76 kcal/day
9. Potato/corn chips	70 kcal/day
10. Ready-to-eat cereals	65 kcal/day

SOURCE: MEAN INTAKE OF ENERGY AND MEAN CONTRIBUTION (KCAL) OF VARIOUS FOODS AMONG US CHILDREN AND ADOLESCENTS, BY RACE/ETHNICITY AND FAMILY INCOMES, NHANES 2005-06:  
[HTTP://RISKFACTOR.CANCER.GOV/DIET/FOODSOURCES/ENERGY/TABLE5B.HTML](http://riskfactor.cancer.gov/diet/foodsources/energy/table5b.html)

The top sources of energy among teens are mainly high-calorie, high-fat, and high-sugar food items, which have displaced fruit and vegetable intake. A research study following teenagers over a period of 5 years found that through the transition from middle school to high school and then from high school to post-high school, intake of fruits and vegetables decreased.

### Top Sources of Added Sugar Among Americans

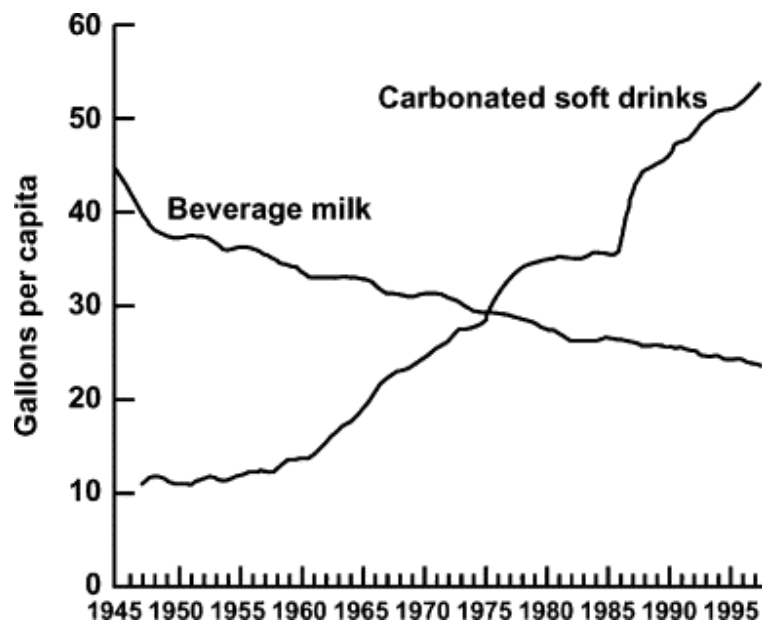


Source: USDA’s Dietary Guidelines for Americans 2010.

The chart above shows that the largest percentage of sugar intake in Americans comes from soda and sugar-sweetened beverages. Sugar-sweetened beverages are the largest contributor of added sugar to the diets of teenagers in the United States. As this consumption increases, it

also displaces the amount of dairy products (specifically, milk) in the diet. Teens have high needs of calcium to maintain bone development, but as soda drinking increases, milk drinking decreases.

### Changes in milk and soda consumption in US Children



Source: National Dairy Council

During adolescence, lifelong nutrition and physical activity habits are developed. Teens who participate in sports receive the benefit of increased physical activity, although they are not exempt from these nutrition concerns. In fact, they sometimes fall prey to additional nutrition risks associated with sports, such as rapid weight change to make weight for a sport, food fads, and supplement use. As a coach, how can you best manage these nutrition concerns?

# Nutrition and Sport Performance

Sports participation in adolescence has many benefits including improving strength and endurance, building healthy bones and muscles, controlling weight, reducing anxiety and stress, increasing self esteem, and possibly improving blood pressure and cholesterol levels.

Athletes must consume enough calories for proper growth, but also for physical activity. Although the exact amount of additional calories required for active teens is not known, they may require 1500-2000 calories in addition to the Recommended Dietary Intake (RDA) (page 3). The number of calories necessary for active teenagers can be significant and it is important to send the message to your athletes about where to obtain these calories. It is easy to meet this level of energy intake through pizza, soda, and grain-based desserts, but sports performance will suffer when energy needs are met through these types of foods.

The main nutrition goal for eating for sports performance is to provide the body with foods that fuel exercising muscles. The most efficient fuel for athletic performance is carbohydrates. Energy from carbohydrates can be released within exercising muscles up to three times faster than energy from fat, however our bodies' capacity for carbohydrate storage is limited. As you read through this section, think about how you can translate this information and the recommendations provided to your athletes.

A training diet should provide 55% of total energy from carbohydrates, 12-15% from protein, and 25-30% from fat.



It is important to mention that protein, in moderation, is essential to sports performance and aids in synthesis, maintenance, and repair of body tissue. However, eating more than the recommended amount of protein does **not** make larger or stronger muscles or improve any of the functions of protein within the body. Protein in excess of total energy requirements will be stored as fat, not as muscle. Building muscle is achieved through eating adequate calories, protein, and other nutrients, as well as exercising the muscles through strength training. Adolescents require 0.9 g protein per kg of body weight (g/kg/d). Teen athletes may require 1.0-1.5 g/kg/d, and endurance athletes may need 1.2-1.4 g/kg/d.

Protein intake should never be more than 1.5 g/kg/d. Most teenagers achieve this through normal intake and do not require additional protein. The best way to ensure adequate protein intake at the best benefit of the athlete is to evenly distribute protein intake throughout the day. When combined with carbohydrate intake, protein foods help sustain the release of energy and control blood sugars.

**Thinking point:** Protein intake is a commonly asked question in athletics. Imagine a scenario where an athlete asks about using protein supplements. As a coach, how will you respond and what will you recommend.

# What to Eat and When to Eat It

## General Nutrition Needs for Teens

[ChooseMyPlate.gov](http://ChooseMyPlate.gov) provides individuals the opportunity to create their own daily food plan. It also provides information on what counts as a serving and which foods are in the different food groups. It is an excellent resource for nutrition information for all ages.

Vegetables	Fruits	Grains	Dairy	Protein Foods
<p>Eat more red, orange, and dark-green veggies like tomatoes, sweet potatoes, and broccoli in main dishes.</p> <p>Add beans or peas to salads (kidney or chickpeas), soups (split peas or lentils), and side dishes (pinto or baked beans), or serve as a main dish.</p> <p>Fresh, frozen, and canned vegetables all count. Choose "reduced sodium" or "no-salt-added" canned veggies.</p>	<p>Use fruits as snacks, salads, and desserts. At breakfast, top your cereal with bananas or strawberries; add blueberries to pancakes.</p> <p>Buy fruits that are dried, frozen, and canned (in water or 100% juice), as well as fresh fruits.</p> <p>Select 100% fruit juice when choosing juices.</p>	<p>Substitute whole-grain choices for refined-grain breads, bagels, rolls, breakfast cereals, crackers, rice, and pasta.</p> <p>Check the ingredients list on product labels for the words "whole" or "whole grain" before the grain ingredient name.</p> <p>Choose products that name a whole grain first on the ingredients list.</p>	<p>Choose skim (fat-free) or 1% (low-fat) milk. They have the same amount of calcium and other essential nutrients as whole milk, but less fat and calories.</p> <p>Top fruit salads and baked potatoes with low-fat yogurt.</p> <p>If you are lactose intolerant, try lactose-free milk or fortified soymilk (soy beverage).</p>	<p>Eat a variety of foods from the protein food group each week, such as seafood, beans and peas, and nuts as well as lean meats, poultry, and eggs.</p> <p>Twice a week, make seafood the protein on your plate.</p> <p>Choose lean meats and ground beef that are at least 90% lean.</p> <p>Trim or drain fat from meat and remove skin from poultry to cut fat and calories.</p>
<p><b>For a 2,000-calorie daily food plan, you need the amounts below from each food group.</b> To find amounts personalized for you, go to <a href="http://ChooseMyPlate.gov">ChooseMyPlate.gov</a>.</p>				
<p><b>Eat 2½ cups every day</b></p> <p>What counts as a cup? 1 cup of raw or cooked vegetables or vegetable juice; 2 cups of leafy salad greens</p>	<p><b>Eat 2 cups every day</b></p> <p>What counts as a cup? 1 cup of raw or cooked fruit or 100% fruit juice; ½ cup dried fruit</p>	<p><b>Eat 6 ounces every day</b></p> <p>What counts as an ounce? 1 slice of bread; ½ cup of cooked rice, cereal, or pasta; 1 ounce of ready-to-eat cereal</p>	<p><b>Get 3 cups every day</b></p> <p>What counts as a cup? 1 cup of milk, yogurt, or fortified soymilk; 1½ ounces natural or 2 ounces processed cheese</p>	<p><b>Eat 5½ ounces every day</b></p> <p>What counts as an ounce? 1 ounce of lean meat, poultry, or fish; 1 egg; 1 Tbsp peanut butter; ½ ounce nuts or seeds; ¼ cup beans or peas</p>

Source: [ChooseMyPlate.gov](http://ChooseMyPlate.gov) • Center for Nutrition Policy and Promotion • August 2011 • CNPP - 25



**Pre-event meals:** The goal for eating before a sporting event is to maintain optimal blood sugar levels, thus fueling the muscles, as well as preventing the athlete from fatiguing and becoming hungry during the event. The energy for sports performance comes from glycogen (storage form of glucose) stored in the muscles from food eaten 24-48 hours before the event.

Eating before an event can be extremely beneficial, although if done improperly, can have detrimental effects on performance. Eating too much or shortly before an event can lead to incomplete digestion, which can in turn cause cramps, nausea and vomiting, bloating, gas, or diarrhea. Eating too little before an event can diminish performance by depleting glycogen stores causing a lack of energy.

Pre-event meals should provide high levels of carbohydrates, specifically complex carbohydrates, moderate amounts of protein, and small amounts of fat. The foods eaten up to 4 hours before an event should be relatively low-fiber, to help decrease possible side effects such as cramping and bloating. The timing is also important to achieve the best benefit. The closer you are to the event, the smaller the meal/snack should be. The following chart shows examples of meals and snacks to eat at various times prior to an event. As mentioned before, eating too much close to the beginning of an event can cause unwanted side effects that could affect performance.

For more information on pre-event meals, please access the American College of Sports Medicine's [current position on pre-event meals](#).

Meal/Snack	Timing	Examples
Snack 15-20g carbs <5% fat	30 min- 1 hour before	1 oz. Pretzels/1 banana/1 granola bar, fluids
Light Meal 30-40g carbs 5-15% fat	2-4 hours before	1 Turkey sandwich, 1 piece of fruit, 8 oz low-fat milk, fluids
Heavy Meal 50-60g carbs 15-25% fat	4-5 hours before	6 oz baked chicken, 1/2 c potatoes, 1 c fruit, 1 c vegetable, 1 oz/slice whole grain bread, fluids

### **Ideas for pre-event snacks:**

- Granola bar
- 1 oz pretzels or crackers
- 1 piece of fruit (low fiber, such as a banana)
- 1/2 of a peanut butter sandwich

### **Some tips for the best quality pre-event meal:**

- Allow two full hours before the event to digest a larger meal and do not overeat
- Minimize high-fat and high-fiber foods before the event. Avoid fried foods, large salads, popcorn, nuts, seeds, etc.
- Sip fluids often after the meal to aid in digestion and absorption, but do not drink too much
- If there is a long time between a meal (school lunch) and the event, bring a small snack to school and eat 30 min- 1 hr before game time.

**During the event:** Unless an athlete is participating in an ultra-endurance sport (triathlon or marathon), they should not be consuming solid foods during the event. The most important thing to have during a sporting event is fluids, which should be sipped on a regular basis. If total time exercising during a competition is >60 minutes, a sports drink like Gatorade or Powerade can be used to replenish some glycogen stores and electrolytes lost through perspiration. [As a coach](#), if you feel like you should provide a snack to your athletes during a longer event (tournament, invitational), it should be planned ahead of time and provide long-lasting energy. Snack ideas include: granola bars, fruit, vegetables, crackers with peanut butter, or cheese sticks. Items like candy, ice cream, and cookies should not be offered as a snack in these scenarios. These simple carbohydrates cause spikes and then crashes in blood sugar. Instead of providing energy to sustain the athletes through the event, blood sugars will plummet, leaving them feeling even more fatigued than before.

**Post-event meals:** The goal for eating after a workout is to replenish lost energy and fluids in order to prepare for the next event or practice. Muscles are most receptive to storing glycogen during the first two hours after competition. Eating within 20 minutes and up to 2 hours after exercise is ideal for restoring energy.

Rapidly absorbed carbohydrate foods like fruits, crackers, yogurt, fig bars, granola bars, and sports drinks work well to restore muscles within 20 minutes of exercise. It is also important to have some protein to assist with recovery as well. Research shows a ratio of 1:3 of protein to carbohydrates is best for muscle glycogen recovery. Chocolate milk is one of the best drinks for recovery because it fits the 1:3 protein to carb ratio. Coaches are in a perfect position to suggest post-competition snacks that not only enhance recovery but also supply calcium and iron which are nutrients of great concern for adolescents.

Snack ideas for post-competition:

- dry cereal with milk
- banana with peanut butter
- milk with graham crackers
- chocolate milk
- cottage cheese and fruit
- yogurt and fruit
- half of a peanut butter or turkey sandwich
- crackers with peanut butter
- crackers with cheese
- fruit and a cheese stick

It is important to consume a post-event snack with the 1:3 protein to carb ratio every 2 hours until your next complete meal. Appendix F offers suggestions for quick, healthy meals for busy families.

**Thinking point:** Imagine your team is going to an away event on a Saturday. The bus leaves from the school at 11 AM and is due to be at the event location at 1 PM. The event will be from 3-5 PM, and the bus will return to the school at 7 PM. How would you manage food for this whole-day event? What would you recommend to your athletes and their parents to prepare for this?

Hydration: Athletes have increased needs for fluids to replace those lost in sweat and to cool the body during exercise. Dehydration decreases performance, slows the recovery time after an exercise, and can have serious health effects. Feeling thirst is one of the last markers of dehydration, so it is important to combat it before that stage. Symptoms of dehydration include dizziness, weakness, fatigue, poor physical performance, low output of dark colored urine, and decreased blood pressure. Coaches should plan for and recommend regular hydrations breaks to keep athletes from getting dehydration. Even mild dehydration

can be detrimental to performance. Athletes may forget to drink if not reminded to do so on a regular basis.

Similar to eating, there are guidelines for hydration before, during, and after sports performance. Individual recommendations vary depending on body size, the intensity of the sport, and the temperature of the environment (indoor vs outdoor, fall vs spring seasons).

Time	Hydration amounts
1-2 hours before event	16 ounces* of cool water
10-15 minutes before event	12 ounces of cool water
During exercise	4-8 ounces water every 15-20 minutes
After exercise	16-24 ounces of cool fluids for every pound of weight lost

\*8 ounces = 1 cup

**Some tips for hydration management:**

- Avoid caffeine before sporting events.
- Remind them to sip on fluids throughout competition. Athletes do not instinctively drink enough fluid. Fluids should be available to athletes at all times during practice and competition.
- Fluid restriction should never be used to reduce weight, meet weight class, or as a punishment.
- Activities <60 minutes require only water for hydration, while other sports drinks are beneficial for activities exceeding 1 hour.
- Suggest athletes weigh themselves before and after practice/events to see how much fluid is lost. Replace lost fluids with 16-24 ounces per every pound lost.

**Thinking point:** Take the time to create a hydration policy for your team.

## Sample meal plan for an athlete

Breakfast	8 oz skim milk	90 calories
	1 cup dry cereal	110 calories
	1 banana	70 calories
	8 oz orange juice	110 calories
Lunch	Turkey sandwich	375 calories
	Apple	80 calories
	2 oz pretzels	210 calories
	8 oz skim milk	90 calories
	8 oz yogurt	240 calories
Snack	Part-skim string cheese	80 calories
	Apple	55 calories
Dinner	3 oz grilled chicken	150 calories
	1 c brown rice	215 calories
	½ c vegetables	45 calories
	1 c frozen yogurt	380 calories

Total: 2390 calories

# The Tricky Balance of Talking to Teens

Being a coach is complicated. Although sports performance and individual success are priorities, these outcomes are also affected by other factors such as psychosocial well-being and nutrition. Some of the language coaches use to encourage success and performance can unknowingly cause stress and damage if the approach and words are not selected carefully. This is particularly true for female athletes. Although coaches have the best intentions for their athletes, there can be instances of communication between coach and athlete that could turn into problematic scenarios.

Sometimes the most benign comments from a coach can reach adolescent ears in a negative light. Poor body image is common during adolescence for both male and female teenagers. Female teenagers who participate in activities that focus on appearance, body shape and size, or weight class (ballet, gymnastics, crew, running) are at greatest risk for developing disordered eating related to poor body image. Males are also at risk; especially in sports where they need to make “weight” such as wrestling and martial arts.

It is important to be aware of the wording you select as a coach. Saying something as simple as, “you look good out there” can be turned around in a teenage mind to mean that they had never performed up to your standards before, that they need to lose weight to look even better, or another athlete could hear the comment and wonder why they weren’t told they look good as well. It is important to stress skills and healthfulness rather than using “body talk” with teenage athletes.

Promoting health and skills improvement will most likely be a positive way to encourage and help your athletes.

The prevalence of eating disorders is on the rise, although statistics may not be completely accurate due to the secretiveness and shame associated with the disorder. In the United States, 10 million females and 1 million males have an eating disorder. Many longitudinal studies have shown that prevalence of eating disorders have increased through the years for both male and female teenagers, specifically. About 1% of all female adolescents have anorexia nervosa, and 4% have bulimia nervosa. 10% of all teenagers with anorexia or bulimia are male.

Education on eating disorders can help coaches be more aware of the signs and symptoms associated with them. Coaches should be aware of any irregular eating behaviors in athletes, notice excessive weight loss, symptoms of dizziness, increased fatigue or fainting, and/or frequent injuries. The school nurse, athletic director, and/or parents should be made aware of these signs. For more information on eating disorders in sports participation, please see the [ACSM's current comment on eating disorders](#).

Sports participation and unhealthy eating habits can result in untoward consequences. The [female athlete triad](#) is a term coined for the constellation of unhealthy eating behaviors, amenorrhea (ceasing of menstruation), and osteoporosis. The triad is intertwined in that each characteristic can affect the others. Insufficient energy intake can lead to menstrual irregularities and premature bone loss, increasing the risk for stress factors. Insufficient caloric intake can be a result of many things. Some teens have disordered eating, others find it difficult to achieve adequate caloric intake when performing in endurance sports, others are afraid of getting “fat”, while others may have a diagnosable eating disorder. Again, it is a coach's responsibility to be informed about nutrition and current nutrition trends, use language that enhances self-



esteem and healthy eating practices, and be cognizant when eating patterns have gone awry. Coaches should feel free to bring their concerns to the attention of both the athlete and their parents and make appropriate referrals when necessary. Registered dietitians are excellent resources for questions about sports nutrition.

When talking to athletes about nutrition, it is best to avoid labeling foods as “good” or “bad” foods. This can be difficult to do, but this kind of language encourages dichotomous thinking that can get teens in trouble when trying to make healthy food choices. There are foods we would prefer our athletes to eat more often, but characterizing foods in black or white categories can cause more problems than it’s worth. For instance, when foods are labeled in this fashion, the person may think they are a bad person if they consume some of the less healthy foods, which can result in unnecessary restriction. The more important message to get across to your athletes is that nutrition is a balancing act and no food or diet is perfect. It is important to include a wide variety of whole, minimally processed foods daily, including many fruits and vegetables. On the other hand, depending on the intensity and duration of the sport, many athletes require a significant increase in caloric intake. Occasional consumption of some of the less healthy foods is not the worst thing they can do, especially if the athlete has consumed a well balanced diet otherwise.

If an athlete asks you whether a certain food is “good or bad for me”, the best response is to ask them why they are asking the question and what they think about the food. Perhaps they are looking for something quick and easy to consume before a competition but want something that will not upset their stomach. There are challenges to finding the best foods for them (time restraints, caloric and nutrition content, need for refrigeration, etc) and compromises may be necessary. You can help them navigate the decision making process of what food to select to achieve their goal of enhanced performance without compromising

general nutrition principles. If there is a better food choice to be made, ask the athlete what they think that might be.