Sports Nutrition for the High School Athlete

Physically active individuals have special nutritional needs. Learning what and when you should eat and drink may improve your performance. Eating right can help you feel good and stay fit throughout your lifetime.

For older athletes that have entered puberty (for example: boys ages 13-18), muscle growth is accelerated with the onset of puberty brought about by the presence of testosterone. It is at this phase of a young athlete's development that strength training can be introduced, in addition to proper diet, and rest. Strength training, proper diet, and rest will encourage the growth of lean muscle mass. High school football weight training, in particular, can be beneficial in supporting the player's strength and weight goals. With diet and intentional strength training, weight gain of up to 15% per year is not uncommon in this phase of an athlete's life. Below are two growth chart assuming 15% annual weight growth and approximately 1 inch of height growth per year and 10% weight growth per year. Note that these weight growth and height growth assumptions may not be achieved every year.

Example Growth chart assuming approximately 15% annual weight growth & approximately 1 inch per year of height growth:

Height and weight at beginning of 9th grade		Height and weight at beginning of 10th grade		Height and weight at beginning of 11th grade		Height and weight at beginning of 12th grade	
5'6"	135	5'7"	155	5'8"	179	5'9"	205
5'8"	140	5'9"	161	5'10"	185	5'11"	213
5'10"	150	5'11"	173	6'0"	198	6'1"	228
6'0"	160	6'1"	184	6'2"	212	6'3"	243
6'2"	170	6'3"	196	6'4"	225	6'5"	259
6'4"	180	6'5"	207	6'5"	238	6'6"	274

It's important to know which kind of activity you're partaking in because each kind of activity as its own set of dietary rules.

Activity Definitions:

- Endurance — Vigorous, continuous activity for an hour or longer. Examples are distance running, cycling and cross-country skiing.
- High Intensity — Short bursts of maximum or near maximum effort. Examples include weight lifting and sprinting.
- Moderate — Physical exertion difficult enough to increase your heart rate and cause heavy breathing, but easy enough to sustain for more than 30 minutes. Examples include aerobics, playing basketball and brisk walking.
- Low Intensity — Everyday activities that involve movement of major muscle groups. Examples are walking upstairs, walking to the store and washing the car.

How Activities Affect Calorie and Protein Needs:

The best diet for all athletes consists of 55 percent to 65 percent of total calories from carbohydrate, 25 percent to 30 percent from fat and 10 percent to 20 percent from protein.

- **Endurance** — The energy demands of endurance activities are high. It is important that the body has adequate fuel stores for activities of long duration. For elite athletes, such as marathon runners or triathletes, energy needs are often as high as 3,000 to 5,000 calories per day. These athletes also have increased protein needs. Once the body's carbohydrate stores are depleted, muscle protein is broken down for energy. If you regularly perform endurance activities, your calorie and protein needs are at the upper end of the recommended range.
- **High Intensity** — High-intensity sports affect nutritional needs in different ways based on the activity and the person's body size. These athletes have increased calorie needs, though not as high as endurance athletes. Weightlifters do need more dietary protein than the average person. In fact, protein intake in excess of the recommended levels does not increase muscle mass or strength and can lead to dehydration, osteoporosis and kidney disease. If you are performing high-intensity activities on a regular basis, your calorie needs are at the middle of the recommended range and your protein needs are at the upper end of the recommended range.
- **Moderate Intensity** — Moderate-intensity sports increase your caloric needs depending on the frequency and duration of your activity. In general, be sure you are consuming adequate calories by eating at least the lower end of the recommended range. Consistently under-eating will eventually lead to fatigue and hinder your athletic performance.
- **Low Intensity** — Low-intensity activities do not alter calorie and protein needs. These activities are important to include on a daily basis for general health benefits.

Energy and Protein Ranges for Active Individuals:

To calculate your calorie needs:
1. Divide your body weight in pounds by 2.2 to get your weight in kilograms.
2. Multiply your weight in kilograms by 40.
3. Add 100 calories for every 10 minutes of activity you do on an average day.

To calculate your protein needs:
Multiply your weight in kilograms by 2 to get the total grams of protein you need each day.

Example: For a young man who weighs 185 pounds and works out an average of 90 minutes a day, five days per week:

- 185 / 2.2 = 84.1 kilograms body weight
- 84.1 x 40 = 3364 calories per day
- 3364 + (9 x 100) = 4264 calories per day
- Protein needs: 84.1 kilograms x 2 gram of protein = 168.2 grams of protein per day

Tips for gaining lean muscle mass:

- Lift weights and condition with a sense of urgency – do not just go through the motions, do your best – lift hard, run hard, work hard. Attend every workout – don't skip workouts. Learn to get comfortable being uncomfortable during workouts – push yourself to do your best
- Never skip meals. Yes, this means you need to get up in time for breakfast, you can't skip lunch, and dinner actually needs to be prepared and eaten.
- Eat at least five times per day – Three meals and two snacks
- Eat two snacks every day. Mid-afternoon and evening.
- Drink caloric beverages. Choose milk or 100% fruit juice when available.
- Choose calorie-dense foods. That means eating potatoes, corn or peas instead of celery and carrot sticks. Or choosing a banana or cranberry juice instead of an apple or orange juice. Granola cereal is more calorie-dense than puffed rice.
- Eat more when you can. Take seconds and thirds when possible if you are trying to gain weight.
- Eat protein throughout the day. Players should not count more than 30 grams of protein in one sitting of whole food. For example a huge steak that has 100 grams of protein cannot be counted as 100 grams toward their total number for the day; only 30 of it may be counted. Players should never go more than 2- 3 hours without having some source of protein.
- Protein shakes are OK. If drinking a 100 gram protein shake only 50 grams can be counted during one sitting because its predigested protein that can be utilized immediately. But a player may not eat the food and shake in the one sitting and count it all...it's one or the other.
- Eat as many carbs as you want. Players can eat as many carbs as they wish in one sitting because carbs are much easier to digest and can be stored, whereas whole food protein cannot be stored and is more difficult to digest.

Example growth chart assuming 10% weight growth with recommended calories, carb, and protein targets:

	Weight at start of Frosh year	Weight at start of Soph year	Weight at start of Junior year	Weight at start of Senior year	Example Target Calories per day	Example Target Carb grams per day	Example Target Protein grams per day
Player weighing 110 lbs to start	110	121	133	146	3400	600	130
Player weighing 130 lbs to start	130	143	157	173	4200	740	150
Player weighing 150 lbs to start	150	165	182	200	4300	760	165
Player weighing 170 lbs to start	170	187	206	226	4400	790	170
Player weighing 190 lbs to start	190	209	230	253	4500	800	180

Below are some **example** meal plans for athletes that would like to gain weight, tailored to a typical high school schedule, based on caloric targets. It's important that athletes eat every 3 to 4 hours.

Example 4500 Calorie Meal Plan, tailored to a typical school day and practice schedule:

6:30 AM - Breakfast - 2 frozen waffles (Nutrigrain) or 1 PB & banana sandwich or 2 bowls cereal; 2 Tablespoons Peanut Butter (if eating frozen waffles); 1 Banana; 2 cups milk and/or 1 cup yogurt

9:00 AM - Snack - peanut butter and jelly sandwich or protein bar + water

11:30 AM - Lunch - 1 Footlong Sub Turkey and Cheese or Two Chicken Sandwiches; 1 piece of fresh fruit; 2 cups of juice or milk &/or 1 protein bar

2:30 PM - Snack - prior to 1 protein bar or ½ PB & banana sandwich; Practice 1 piece of fruit (orange, apple, banana); At least 2 cups water, sports drink or milk

2:30-5:30 PM - Practice/Workout - 6-7 cups of water or sports drink

5:30 PM - Post practice snack - Protein bar or PB & J sandwich and/or banana, orange

7:00 PM - Dinner - 6-7oz of grilled steak/chicken / fish / ground beef (extra lean) spaghetti; 1 baked potato w 1t. butter or 1 large tortilla; 1 cup of broccoli, carrots, corn, or beans; Salad with dressing; 1 wheat roll; 2 cups of milk

9:00 PM - Snack - 1 peanut butter and jelly sandwich or ½ PB & banana sandwich; 1 cup low-fat yogurt &/or 1 cup of milk

Example 3500 Calorie Meal Plan, tailored to typical school day and practice:

6:30 AM - Breakfast - 2 cup oatmeal with 1 cup of low fat yogurt, or 1 Tbsp brown sugar; Banana; 1 cup milk

9:00 AM - Snack - 1 protein bar, 1 PB&J sandwich, and/or fresh fruit

11:30 AM - Lunch - 1 Turkey/Ham sandwich with mayo; 1 piece of fresh fruit (banana); 1 cup of sports drink, juice, or milk; 1 cookie or sports bar

2:30 PM - Snack - prior to 1 protein bar or ½ PB&J sandwich; Practice 1 piece of fruit (orange, apple, banana); 1 cup sports drink or milk

2:30-5:30 PM - Practice/Workout - 6-7 cups of water

5:30 PM - Post practice snack - protein bar, PB & J sandwich, and/or banana, orange

7:00 PM - Dinner - 4-5oz (lg deck of cards) of grilled chicken, steak, or extra lean hamburger; 1 cup rice or pasta or 1 medium sized tortilla or 2 small tortillas; 1 cup of broccoli, corn, carrots, or beans; Salad with dressing; 1 wheat roll w/butter; 1 cup of milk or sports drink

9:00 PM - Snack - 6 to 8 Triscuits or 2 graham crackers with 1 tablespoon of peanut butter; Fresh fruit & 1 cup milk

Parents often ask what can be done to give their player the best chance to secure a D1 football scholarship. In fact, less than 1% of all high school football players are offered a scholarship to play football at a Division 1 program. (The percentage of players that play at Division 2 and Division 3 programs is somewhat better but still relatively small). That said, college coaches are generally looking for players that are relatively big, fast, athletic, and have the ability to graduate from college. Regarding optimal size and weight by position, there are some height and weight guidelines that some colleges use (see below). However, there are always exceptions to these guidelines. Nearly every collegiate team has productive players that may not meet the height and/or weight guidelines. Accordingly, the table below should be used as a general guideline only.

Suggested weight chart by position (assumes athlete retains athleticism at all weights):

Height ==> / Position	5'11"	6'0"	6'1"	6'2"	6'3"	6'4"	6'5"	6'6"	6'7"
OT, DT	210-220	220-240	230-250	240-260	245-265	255-265	260-280	265-290	270-295
TE, DE	205-220	210-225	215-230	220-235	225-240	230-250	235-255	240-260	250-260
OG, C, NG	220-230	220-240	230-250	240-260	245-265	255-265	260-280	265-285	270-295
QB	180-190	190-205	195-210	200-215	210-220	220-235	230-240	235-245	
WR, DB	185-200	190-205	195-210	200-215	205-220	215-225	220-230		
RB, LB	200-210	205-215	210-220	215-230	225-235	230-250	235-255		

Green indicates optimal D1 football recruit height and weight for a given position

Water Needs and Activity:

During physical activity, water has many important functions. It serves to cool the body, maintain adequate blood flow to working muscles and allow for the body's basic functions to continue to work. Relying on sense of thirst will not keep you properly hydrated because the body's thirst mechanism is dulled during exercise. **By the time you feel thirsty, you are already in a state of mild dehydration.**

Use the following tips as a starting point for remaining adequately hydrated. Then monitor weight changes and the color of your urine to determine your own fluid needs following activity. When you are properly hydrated, your urine will be clear or very pale in color. When your body is dehydrated, your urine will be a darker shade.

- **Before Exercise** — Drink 20 to 40 fluid ounces (or 3 to 5 cups) of water over the two to three hours before activity and another 4 to 8 ounces every 15 to 20 minutes prior to starting exercise.
- **During Exercise** — Consume 4 fluid ounces (1/2 cup) of water for every 20 to 30 minutes of activity.

- **After Exercise** — Immediately after exercise, drink 16 fluid ounces (2 cups) of water for every pound of weight lost. This requires that you weigh yourself before and after exercise. Since this may not be practical in some situations, weigh yourself before and after an activity, when you have access to a scale and use this as a basic guide.

The best replenishment drink is water. Sports beverages can be used, though they can be high in sugar and calories. These drinks are only beneficial if you have performed an endurance activity for more than 60 minutes or if you are exercising in an especially hot or humid climate.

Summary
For older players, strength training with intent and discipline, proper diet, and rest are necessary to achieve full potential. Lifting and conditioning with discipline, eating well (and eating often throughout the day – target 5 times per day), and getting the necessary rest will provide the best chances for the athlete to reach his full potential and will increase his chances of playing at the next level.