Buffalo State

Sports Performance Nutrition Manual
Buffalo State Bengals’

Strength & Conditioning Performance Nutrition

This manual is for the purpose of educating Buffalo State student-athletes on nutrition, recovery, and lifestyle habits and their importance for reaching peak performance. For more information on any section in this manual please use the following contact:

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Reaching Peak Performance

Our Mission: Buffalo State's intercollegiate athletics program endeavors to provide a quality and competitive intercollegiate athletics program consistent with the National Collegiate Athletics Association (NCAA) Division III philosophy and the overall educational mission of Buffalo State.

Intercollegiate athletics is sponsored as an educationally purposeful activity that focuses on the individual development of the student-athlete. It emphasizes the positive value of physical activity, learned skills, competition, good sportsmanship, and teamwork with a diverse population of student-athletes. The intercollegiate athletics program will strive to instill in all student-athletes the desire and ability to represent themselves, their team, the department and the college in a positive manner at all times.

The intercollegiate athletics program is committed to the physical and emotional well-being of student-athletes and strives for multicultural diversity in the student-athlete population. In concert with the mission of Buffalo State, we are committed to the intellectual, personal and professional growth of our student-athletes, and we strive to foster citizenship, sportsmanship and conduct, which bring credit to the image of Buffalo State.

We are committed to the recruitment and retention of a diverse population of highly motivated student-athletes. We are also committed to the recruitment and retention of coaches and athletics staff personnel that represent multicultural diversity who can contribute to the success of our student-athletes to help foster pride, spirit, and diversity throughout the college.

It is important for us to educate our student-athletes on the benefits of proper nutrition and how it can lead to reaching peak performance both in the weight room and on the field, track, court, ice, etc.
10 Daily Keys to Peak Performance through Nutrition

1. Eat a balanced breakfast every day (eat as soon as you wake up in the morning)
2. Eat 5-7 smaller meals to increase metabolism and keep fuel in your system
3. Drink 1 gallon of water per day (women aim for 9 cups per day)
4. Have a lean protein source with each meal
5. Consume post workout shake with protein powder within 45 minutes of training
6. Prepare sandwiches, granola, trail mix, fruit/veggies the day before
7. Choose lower GI foods whenever possible (refer to pages 14-16)
8. Choose whole grains whenever possible (first ingredient must be ‘WHOLE’)
9. Have a minimum of 7-9 hours of sleep
10. Choose natural foods over processed foods whenever possible and eat a variety of colors
Benefits of Proper Nutrition

Some of the more noticeable benefits of proper nutrition for athletes:

- **Increase in Athletic Performance**
- Increases in Conditioning Levels
- Increases in Strength Levels
- Increases in Movement Efficiency
- Increases in Energy Levels / Sustained Energy Levels
- Increases in Mental Capacity and Cognitive Abilities
- Increases in Metabolic Functioning
- Increases in Immune System Functioning
- Increases in Lean Muscle Mass
- Decreases in Recovery Time Between Workouts, Practices, and/or Games
- Decreases in Risk of Injury
- Decreases in Time for Recovery From Injury
- Decreases in Risk of Chronic Fatigue
- Decreases in Body Fat
- Decreases in Amount of Muscle Tissue Loss During the Season

There are many more benefits that come along with proper performance nutrition – like decreases in risks of deadly diseases such as cancer and diabetes (among others). The complete list would take up too much space; bottom line is proper sport performance nutrition is essential to the athlete who wants to take his or her game to the next level.
Determining Caloric Intake

Calories supply the body with energy and can only be found in carbohydrates, proteins, fats, and alcohol. Everyone’s caloric needs are different depending on gender, age, height, weight, and activity level. It is important to know and determine how many calories your body needs every day. Consuming more calories than your body needs results in weight gain while consuming fewer calories than your body needs leads to weight loss. Basal Metabolic Rate (BMR) is the amount of calories you need (burn) while resting. To determine the minimum amount of calories your body needs, use the following calculation:

**Women:**
\[655 + (4.35 \times \text{weight in pounds}) + (4.7 \times \text{height in inches}) - (4.7 \times \text{age}) = \text{BMR}\]

**Men:**
\[66 + (6.23 \times \text{weight in pounds}) + (12.7 \times \text{height in inches}) - (6.8 \times \text{age}) = \text{BMR}\]

**Activity level:**
Once you have calculated your BMR, choose your activity level and multiply your BMR by the corresponding percentage. Take that number and add it to the original BMR and you have your Total Daily Caloric (TDC) need.

<table>
<thead>
<tr>
<th>Activity Level</th>
<th>BMR Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedentary</td>
<td>BMR*20%</td>
</tr>
<tr>
<td>Lightly Active</td>
<td>BMR*30%</td>
</tr>
<tr>
<td>Moderately Active</td>
<td>BMR*40%</td>
</tr>
<tr>
<td>Very Active</td>
<td>BMR*50%</td>
</tr>
<tr>
<td>Extremely Active</td>
<td>BMR*60%</td>
</tr>
</tbody>
</table>

Example of calculating your TDC:
A 21 year old man who is 6 foot 4 inches, weighs 220 pounds and is moderately active: BMR=\[66 + (6.23 \times 220) + (12.7 \times 76) - (6.8 \times 21)\]
BMR=66 + 1370.6 + 965.2 – 142.8
BMR=2,259
2259*.40 = 903.6
**Total Daily Caloric Intake = 2259 + 903.6 = 3,162.6**

This athlete should plan to get anywhere between 3,100-3,200 TDC per day to meet his needs.
Example of calculating your TDC:
A 21 year old woman who is 5 feet 5 inches, weighs 140 pounds and is moderately active: BMR=655 + (4.35*140) + (4.7*65) – (4.7*21)
   BMR=655 + 609 + 305.5 – 98.7
   BMR=1,471
1471*.40 = 588.4
**Total Daily Caloric Intake = 1471 + 588.4 = 2,059.4**

This athlete should plan to get anywhere between 2,000-2,100 TDC per day to meet her needs.

**It takes approximately 3,500 kcal to lose or gain just one pound.** For example, if an athlete who needed 4,200 kcal/day were to reduce his caloric intake by 500 kcal per day it would take him 7 days to lose one pound, and at a 1000 kcal deficit per day it would take him 3.5 days to lose one pound. The same thing goes for weight gain. If the same athlete who needed 4,200 kcal/day were to increase his caloric intake by 500 kcal per day it would take him 7 days to gain one pound, and at a 1000 kcal increase per day it would take the athlete 3.5 days to gain one pound.
Nutrition Using the 3:2:1 Rule

The simple approach to nutrition gives the athlete an easy ratio to follow in order to determine just how many calories should come from each of the macro nutrient groups: Carbohydrates, Proteins, and Fat. This ratio can be used for the total daily caloric intake as well as for each individual meal.

The 3:2:1 Rule simply states that the athlete will eat three times as many carbohydrates than fat and two times as much protein as fat. This method not only keeps the intake of fat low but it will also ensure that the athlete is receiving the proper amounts of carbohydrates and proteins. This diet includes the following for the total daily intake for each meal:

3 parts Carbohydrates
2 parts Protein
1 part Fat

When looking at this rule in terms of percentages, the athlete will receive the following with the 3:2:1 Rule:

50% Carbohydrate
33% Protein
17% Fat

As you can see, when an athlete uses this method there is low fat intake, a moderate intake of protein and a higher intake of carbohydrates. **This is the optimal ratio for the loss of body fat and the increase in lean muscle mass.** Athletes should use this method when purchasing food, preparing meals, and when eating out. *(3,500 calories is equal to 1 pound)*

**Example of how to set up the 3:2:1 Rule:**
4,200-calorie diet for a 220-pound athlete

Solve for x, 2x and 3x

\[3x + 2x + x = 4,200 \text{ calories} \]

\[6x = 4,200 \text{ calories} \]

\[3x = 2,100 \text{ calories} \quad 2,100 \text{ calories should come from Carbohydrates} \]

\[2x = 1,400 \text{ calories} \quad 1,400 \text{ calories should come from Protein} \]

\[x = 700 \text{ calories} \quad 700 \text{ calories should come from Fat} \]
It is important to note that the ‘3:2:1 Rule’ is a general recommendation and a simple and easy way to get the appropriate ratio of macronutrients. In some instances it may seem a little farfetched and unrealistic to hit the desired grams/calories for a particular macronutrient. All athletes should be aware of other reputable macronutrient guidelines from the Institute of Medicine (IOM) and the United States Department of Agriculture (USDA).

The information in the table below is based on a 2,000 kcal diet plan:

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>3:2:1 Rule</th>
<th>USDA</th>
<th>IOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrate, g</td>
<td>250</td>
<td>275</td>
<td>275</td>
</tr>
<tr>
<td>Carbohydrate, %</td>
<td>50</td>
<td>55</td>
<td>45-65 (55)</td>
</tr>
<tr>
<td>Protein, g</td>
<td>167</td>
<td>90</td>
<td>F: 46, M: 56</td>
</tr>
<tr>
<td>Protein, % kcal</td>
<td>33</td>
<td>17</td>
<td>10-35 (11)</td>
</tr>
<tr>
<td>Fat, g</td>
<td>37</td>
<td>65</td>
<td>76</td>
</tr>
<tr>
<td>Fat, %</td>
<td>17</td>
<td>28</td>
<td>20-35 (34)</td>
</tr>
</tbody>
</table>
Basic Nutrition Guidelines

Sound sports nutrition is essential to full recovery from training and competition. Recoverability will dictate improved sports performance. Training sessions are simply the stimulus for improvement. A stimulus without recovery will lead to overtraining, increased risk of injury, and decreased sports performance. Recoverability is regulated by the food and water you consume and the rest you get. Good nutrition habits will ensure that the following occurs:

- Full recovery from each training session or practice to ensure optimal benefit is achieved from each session
- An increase in energy throughout the day and during each training and practice session
- A much lower incidence of missed training and practice sessions due to illness
- Proper hydration so as to ensure optimal performance and decreased risk of injury in all training and practice sessions

Here are a few basic nutrition tips for creating good nutrition habits:

- Eat breakfast every day
- Proper nutrition can be complemented with supplementation if needed
- Drink a gallon of water per day
- Eat a minimum of 5 vegetables per day, variety of colors is best
- Consume a 1st Choice (lean) source at every meal
- Eat 5-7 smaller meals each day to increase metabolism and keep fuel in your system
- Consume a post workout meal or shake within 45 minutes of a training session
- Avoid eating high (saturated and trans) fat foods
- Avoid eating simple sugars and caffeine
- Avoid eating fried foods (chicken, fish, french fries, chips)
- Avoid foods with more than 5 ingredients, or have ingredients you can’t pronounce; the more natural the better
- Limit cream based salad dressings (Ranch, Thousand Island, Caesar)
- Eat 2-4 servings of fruit (berries are best because of low GI)
- Shoot for 5-7 servings of non starchy vegetables
Carbohydrates (CHO)

Athletic Significance of Carbohydrates:

- Carbohydrates are the primary fuel source
- Carbohydrates are the primary glucose source
- The body stores glucose in the form of glycogen
- Glucose is the primary fuel source for the brain and nervous system
- Carbohydrates are involved in maintaining blood glucose levels, which are vital to performance and appetite control

How Much:

As you recall, the athlete using the 3:2:1 Rule will need to consume 2,100 calories from carbohydrates. *(USDA: 2,310 | IOM: 2,310)*

1 gram of carbohydrate = 4 calories

This athlete will need:

2,100 calories / 4 kcal/gram = 525 grams of carbohydrates each day

Carbohydrates are a very important part of the diet; they provide the majority of the calories. Carbohydrates are made of sugars, starches, celluloses, and gums, which contain carbon, hydrogen, and oxygen in similar amounts. **Carbohydrates are the fuel source for the body, especially the brain and nervous system.** The body breaks down starches and sugars into a substance called glucose, which is then used by the body for energy. Athletes should shoot for 1st choice carbohydrates whenever possible.

Types of Carbohydrates:

Monosaccharide: Glucose, fructose, sorbitol, galactose, mannitol, mannose

Disaccharides: Sucrose = glucose + fructose
              Maltose = glucose + glucose
              Lactose = glucose + galactose
Polysaccharides: Starch, dextrin, cellulose and glycogen. These are all made from chains of glucose (glucose polymers, maltodextrins). Monosaccharide and Disaccharides constitute the simple sugars; Polysaccharides constitute the complex carbohydrates.
Athletes should use the Glycemic Index (GI) when choosing what carbohydrates to eat. The GI is a tool that measures how fast a certain carbohydrate will raise the blood sugar. In most cases, white bread is the standard to which everything is set – it has an index of 100. Due to their slower absorption, complex carbohydrates have lower indexes where the simple sugars are higher. Low GI carbohydrates should be eaten before a workout, whereas high GI carbohydrates may be eaten when blood sugar is low, such as after a workout.

**Quality Carbohydrate Choices:**

<table>
<thead>
<tr>
<th>Carbohydrate</th>
<th>Glycemic Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh Fruit</td>
<td>22-72</td>
</tr>
<tr>
<td>Pasta</td>
<td>27</td>
</tr>
<tr>
<td>Fat Free Yogurt</td>
<td>36</td>
</tr>
<tr>
<td>All Fresh Vegetables</td>
<td>35-85</td>
</tr>
<tr>
<td>Potatoes</td>
<td>51-70</td>
</tr>
<tr>
<td>Cereals (Raisin Bran, Oat Bran, Grape Nut, Special K)</td>
<td>54-67</td>
</tr>
<tr>
<td>Rice</td>
<td>55-58</td>
</tr>
<tr>
<td>Raisins</td>
<td>64</td>
</tr>
<tr>
<td>Whole Wheat Bread</td>
<td>69</td>
</tr>
<tr>
<td>Oatmeal</td>
<td>Unknown</td>
</tr>
<tr>
<td>Rolls</td>
<td>Unknown</td>
</tr>
<tr>
<td>Bagels</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Easy ways to increase the amount of complex carbohydrates into the diet:

- Incorporate fruits, vegetables, and seeds into your meals
- Fresh produce is best, but to avoid spoilage and to ensure availability, buy a combination of fresh, frozen, and canned fruits and vegetables
- Try to include carbohydrates from all three groups when shopping
- When not active, reduce your total carbohydrate intake – especially for carbohydrates with a high GI
Controlling Your Blood Sugar Using the Glycemic Index

Athletes have always been told to eat plenty of carbohydrates before a workout or competition. The question becomes which carbohydrates are best for your particular sport?

The Glycemic Index (GI) is a useful tool that measures how fast a certain food will raise your blood sugar. It is important to note that this only applies to carbohydrates. Athletes can enhance their workouts by controlling their blood glucose levels. For example, if your blood sugar is low or tends to drop during exercise, you would want to eat high GI carbohydrates that raise the blood sugar quickly. On the other hand, prior to an endurance activity you would want to eat lower GI carbohydrates, which have a longer action time.

Generally, foods high in fructose (most fruits) have a low GI value due to their unique absorption process. Other low GI foods include pasta, rice, legumes, bran, and whole wheat breads. High GI foods include most breads, high glucose sports drinks, high sugar cereals, honey, candy, soda, and processed foods.

Consumption of low GI foods 30-60 minutes prior to endurance exercise tends to promote the following effects during exercise:

- Minimizes the hypoglycemia that occurs at the start of exercise (Hypoglycemia is a low blood glucose level)
- Increases the concentration of fatty acids in the blood
- Increases fat use and reduces reliance on carbohydrate fuel

Consumption of high GI foods soon after exercise will promote the restoration of muscle glycogen, thus helping in muscle recovery.

Because a low GI diet seems likely to cause lower blood cholesterol and improved appetite control, a low GI diet on an everyday basis is probably best for athletes and non-athletes alike.
### Carbohydrates

<table>
<thead>
<tr>
<th>1&lt;sup&gt;st&lt;/sup&gt; Choice Low GI</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; Choice Moderate GI</th>
<th>3&lt;sup&gt;rd&lt;/sup&gt; Choice High GI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blueberries</td>
<td>All Bran Cereal</td>
<td>Bananas</td>
</tr>
<tr>
<td>Black Beans</td>
<td>Baked Beans</td>
<td>Cornmeal</td>
</tr>
<tr>
<td>Cherries</td>
<td>Bran Chex</td>
<td>Grapes</td>
</tr>
<tr>
<td>Cooked Carrots</td>
<td>Brown/Wild Rice</td>
<td>Green Peas</td>
</tr>
<tr>
<td>Garbanzo Beans</td>
<td>Grape Nuts</td>
<td>Oatmeal Cookies</td>
</tr>
<tr>
<td>Lima Beans</td>
<td>Multi Grain Bread</td>
<td>Popcorn</td>
</tr>
<tr>
<td>Kidney Beans</td>
<td>Oat Bran</td>
<td>Raisins</td>
</tr>
<tr>
<td>Lentils</td>
<td>Cantaloupe</td>
<td>Pineapple</td>
</tr>
<tr>
<td>Grapefruit</td>
<td>Pita Bread</td>
<td>Sweet Corn</td>
</tr>
<tr>
<td>Dried Apricots</td>
<td>Rye Bread</td>
<td>Sweet Potatoes</td>
</tr>
<tr>
<td>Tomato Soup</td>
<td>Special K Cereal</td>
<td>Wheat Crackers</td>
</tr>
<tr>
<td>Pears</td>
<td>Whole Grain Bread</td>
<td>Whole Wheat Flour</td>
</tr>
<tr>
<td>Plums</td>
<td>Fruit Cocktail</td>
<td>Macaroni</td>
</tr>
<tr>
<td>Strawberries</td>
<td>Unsweetened Fruit</td>
<td>Corn Tortilla</td>
</tr>
<tr>
<td>Fettuccini</td>
<td>Quinoa</td>
<td>Yams</td>
</tr>
<tr>
<td>Spaghetti</td>
<td>Oranges</td>
<td>Kiwi</td>
</tr>
<tr>
<td>Wheat Tortilla</td>
<td>Mango</td>
<td>Grapefruit Juice</td>
</tr>
<tr>
<td>Low Fat Yogurt</td>
<td>Orange Juice</td>
<td>Beets</td>
</tr>
</tbody>
</table>
Example of a high GI and a low GI diet:

**High GI**

**Breakfast:** Rice Cakes  
Doughnuts  
Orange Juice  

**Lunch:** Turkey Sandwich on White Bread  
Watermelon  
Pretzels  
Pepsi  

**Dinner:** Steak  
Mashed Potatoes w/gravy  
French Bread w/butter  
Green Peas  

**Snacks:** Skittles  
Graham Crackers

**Low GI**

**Breakfast:** Steel Cut Oats  
Blueberries  
Almond Milk  

**Lunch:** Turkey Sandwich on Wheat Bread  
Grapefruit  
Almonds  

**Dinner:** Skinless Chicken Breast  
Yam  
Black Beans  
Carrots  

**Snacks:** Low Fat Yogurt  
Dried Fruit
Ways Sugar Can Hurt You

Performance Related:
- Sugar can interfere with the absorption of protein
- Sugar interferes with absorption of calcium and magnesium
- Sugar can decrease growth hormones
- Sugar disrupts mineral and electrolyte balance
- Sugar can cause a decrease in insulin sensitivity

Health Related:
- Sugar produces a significant rise in triglycerides
- Sugar contributes to obesity
- Sugar can lead to cardiovascular disease
- Sugar can cause kidney damage
- Sugar can promote an elevation of low density proteins (LDL) while lowering high density proteins (HDL)
- Sugar can lead to diabetes
- Sugar leads to tooth decay
- Sugar can lead to different types of cancer including cancer of the breast, ovaries, intestine, prostate, or rectum
- Sugar can cause free radicals in the blood stream
- Sugar will decrease the body’s ability to burn fat
- Sugar can suppress the immune system
- Sugar contributes to the reduction of the body’s defense against bacterial infection
Protein (PRO)

Athletic Significance of Proteins & Amino Acids:

- Protein is essential for growth and recovery
- Branched Chain Amino Acids are required to spare muscle breakdown during exercise
- Glutamic Acid and Glutamine are important Amino Acids for growth of muscle tissue
- Individual Amino Acids can elicit targeted effects like growth hormone increase

How Much:

It is recommended to have 0.8 grams of protein per pound of body weight. Some athletes may need more and some athletes may need less, depending on activity level.

In our example, the 220-pound athlete following the 3:2:1 Rule will need 1,400 Calories from protein. (USDA: 714 | IOM: 462)

1 gram of protein = 4 calories

This athlete will need:

1,400 calories / 4 kcal/gram = 350 grams of protein each day

One of the most important nutrients for an athlete is protein. Proteins are used as a building block for our cells, organs, and tissues. With this in mind, it is important to remember that muscle is a tissue; therefore it requires protein to repair, build, and maintain. Proteins are also used to synthesize hormones, enzymes, and neurotransmitters. They are also used for energy production when glycogen levels are depleted. (Glycogen is the storage form of glucose that the body uses to fuel the muscles to contract).

In the simplest terms, proteins are made from amino acids linked together. Nutritionally speaking, amino acids are categorized into two different groups: essential and nonessential. Nonessential amino acids are those that the body can make in sufficient amounts if they are low. Essential amino
acids are those that the body cannot make at all or cannot make in sufficient amounts. The essential amino acids can only come from dietary intake. These amino acids determine whether or not the particular protein is considered complete or incomplete. Complete proteins contain the essential amino acids in amounts that are sufficient for maintenance of normal growth rate. Incomplete proteins are deficient in one or more of the essential amino acids.

It is important for the athlete to remember to not overdo it with protein at each meal. **More is not better.** The human body can only effectively digest and assimilate anywhere from 35-50 grams of protein at any one sitting. Anything over this amount is passed through the system.

An athlete should pick proteins from high quality foods that have a high biological value (BV) or protein efficiency ratio (PER).

**BV:** this is a measurement of protein quality based on how efficiently the protein is used for growth. It is used to describe the efficiency with which protein furnishes the proper proportions and amounts of the essential amino acids: The higher the BV the more quality protein.

**PER:** this is a system of rating the quality of protein by the number of proportions of the essential amino acids in it. It is based on the weight gain of a test subject divided by the consumption of the particular protein.

Examples of foods high in BV and PER:
- Egg whites, lean beef (top sirloin, round steak), sirloin burger, chicken breast, turkey breast, turkey burger, tuna, white fish
- Skim milk and skim milk products also contain protein; however, remember that dairy products, even those made from skim milk, contain more carbohydrates than proteins

These foods have an excellent amino acid profile. They have the proper ratios of the necessary amino acids needed for optimal human muscle growth. Each one has both essential and nonessential amino acids. Although some grains and some beans do contain proteins, the amino acid profile is poor in comparison. Beans and grains contain more carbohydrates, and sometimes even more fat, than they do protein. They are not complete proteins, which mean they do not have all of the essential amino acids needed by the body.
Sources of Protein Based on Their Protein / Fat Content

- 1\textsuperscript{st} Choice = Less than 10% Fat per serving
- 2\textsuperscript{nd} Choice = 11\% - 20\% Fat per serving
- 3\textsuperscript{rd} Choice = 21\% - 30\% Fat per serving

Too much fat can quickly translate into excess calorie intake and storage of fat. Athletes should try to eliminate 2\textsuperscript{nd} and 3\textsuperscript{rd} choice proteins from pre-training or pre-competition meals. The more fat digested, the more blood is diverted to the digestive tract. In order for the muscles to perform at maximum capacity they must not compete for blood. A lower fat protein source like fish or skinless chicken breast is digested quicker.

<table>
<thead>
<tr>
<th>1\textsuperscript{st} Choice</th>
<th>2\textsuperscript{nd} Choice</th>
<th>3\textsuperscript{rd} Choice</th>
<th>Bad Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>95% Lean Ground Beef</td>
<td>1% Milk</td>
<td>2% Milk</td>
<td>Bacon</td>
</tr>
<tr>
<td>95% Lean Ground Turkey</td>
<td>2% Fat Cottage Cheese</td>
<td>75% Lean Ground Beef</td>
<td>Sausage</td>
</tr>
<tr>
<td>95% Lean Ham</td>
<td>85% Lean Ground Beef</td>
<td>75% Lean Ground Turkey</td>
<td>Cheddar Cheese</td>
</tr>
<tr>
<td>Skinless Chicken</td>
<td>85% Lean Ground Turkey</td>
<td>Low Fat Cheese</td>
<td>Whole Milk</td>
</tr>
<tr>
<td>Skim Milk</td>
<td>85% Lean Ham</td>
<td>Frozen Yogurt</td>
<td>Ricotta Cheese</td>
</tr>
<tr>
<td>Fat Free Cottage Cheese</td>
<td>Low Fat Yogurt</td>
<td>Lean Lamb</td>
<td>Beef/Pork Ribs</td>
</tr>
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<td>Skinless White Turkey</td>
<td>Baked Chicken Nuggets</td>
<td>Lean Beef</td>
<td>Fried Fish</td>
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<td>Light Tuna in Water</td>
<td>Dar Meat Turkey</td>
<td>Lean Brisket</td>
<td>Whole Eggs</td>
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<td>Whole Grains</td>
<td>Low Fat Ice Cream</td>
<td>Turkey Sausage</td>
<td>Ice Cream</td>
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<td>Fat Free Yogurt</td>
<td>Dark Meat Chicken</td>
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<td>Baked Fish</td>
<td>Lean Pork Chops</td>
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</tr>
<tr>
<td>Egg Whites</td>
<td>Chicken With Skin</td>
<td></td>
<td>Most Fast Food</td>
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</tbody>
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Fat (FAT)

Athletic Significance of Fat:
- Fatty acids are required for growth, recovery and overall health
- Fatty acids are part a part of each cell – including muscle cells
- Fatty acids are an important energy source, especially for endurance athletes
- Daily intake of metabolizing vitamin and mineral cofactors is necessary for efficient an efficient fat metabolism
- Omega 3 fatty acids and Gamma Linolenic Acid cause beneficial effects on the cardiovascular system, act as moderators of inflammation and play possible roles in improvement of strength and aerobic performance
- Don’t shy away from healthy fats in your diet, slightly increasing fat intake in a well balanced diet has been associated with improved aerobic performance with no compromise to anaerobic power
- Healthy fats play a crucial role to decrease inflammation

How Much:

If we use the example of the 220-pound athlete with the 3:2:1 Rule, 700 calories come from fat each day. (USDA: 1,176 | IOM: 1,428)

1 gram of fat = 9 calories

This athlete will need:

700 calories / 9 kcal/gram = 78 grams of fat each day

This is a ceiling – this athlete will not need more than 78 grams. If he were trying to decrease % body fat, he would eat substantially less. All athletes should use a maximum amount of 80 grams of fat per day or 18% of the total daily calories form fat for optimal health and avoidance of cardiovascular disease and obesity.

Fats are not all bad. Although too much saturated fat, trans-fat, and cholesterol can lead to cardiovascular diseases, monounsaturated fats and polyunsaturated fats are essential for cellular function.
Saturated fats are loaded with hydrogen atoms. Saturated fats are solid at room temperature and have a long shelf life. They are found in high levels in meat, dairy, and other animal products. Palm and coconut oils are also high in saturated fats. The bad news is that saturated fats can raise blood cholesterol.

Unsaturated fats contain fewer hydrogen atoms. Monounsaturated fat is liquid at room temperature but becomes solid in the refrigerator. Canola oil and olive oil are some examples of monounsaturated fats. Polyunsaturated fat is liquid at room temperature and in the refrigerator. Sunflower oil and corn oil are some examples of polyunsaturated fats. Both monounsaturated and polyunsaturated fats help lower cholesterol.

Trans-fat is mainly man made. It starts as an unsaturated vegetable fat and is then ‘hydrogenated’—hydrogen atoms are added making it more like a saturated fat. This process enables it to have a longer shelf life and makes it solid at room temperature. Trans-fat has both the benefits and drawbacks of saturated fat. Although it has a longer shelf life, it tends to raise bad cholesterol and lower good cholesterol. It is found in many baked goods, margarine, and deep fried foods. During the hydrogenating process, it is difficult to control where the hydrogen atoms are forced on to the fatty acid molecule, resulting in an unnatural fat. Ingesting these hydrogenated trans-fats may be extremely unhealthy and linked to various diseases.

Oils, such as canola, olive, safflower, and fish oils, are high in essential fatty acids like oleic acid, linolenic acid, and linoleic acid. These are considered to be good fats.

A good way to lower fat in the diet is to trim all fat and/or skin from beef and chicken before cooking it. Avoid fattening salad dressings, mayonnaise, gravy, butter, margarine, and any food that is fried.

Most fast food items (McDonalds, Burger King, KFC, etc.) are extremely high in fat, so try to avoid them. If you must eat fast food because you’re on the road, or simply don’t have time to prepare food from scratch, try to eat low fat items like sub sandwiches and salads.
Recommendations:

A healthy diet should contain about 15-20% of its calories from fat. Saturated fats should be avoided whenever possible. A general rule of thumb is that fats from animals are saturated and fats from the ground are unsaturated. Good sources of EFA’S can be found in the following foods:

| • Albacore Tuna | • Almonds |
| • Anchovies | • Olive Oil |
| • Avocados | • Olives |
| • Brazil Nuts | • Peanut Butter |
| • Broccoli | • Peanut Butter |
| • Canola Oil | • Salmon |
| • Cotton Seed Oil | • Sardines |
| • Flaxseed Oil | • Sesame Seeds |
| • Herring | • Soy Beans |
| • Mackerel | • Sunflower Seeds (raw) |
|  | • Walnuts |

*Try to avoid extremely heated forms of EFA’S (high heat, light, and oxygen destroy EFA’S). Prepare foods in flaxseed, canola, or olive oil, instead of butter or margarine-based substances.
Vitamins, Minerals & Antioxidants

Athletic Significance of Vitamins:
- Vitamins are essential for normal metabolism, growth, and maintenance of tissue
- Adequate vitamin intake is essential for performance and health
- When vitamin intake is low, performance is decreased
- Performance improvements have been seen with vitamin supplementation
- Optimum vitamin intake is attained from food and supplements

Athletic Significance of Minerals:
- Minerals are needed for normal metabolism, growth, and maintenance of the body
- Adequate mineral intake is essential for performance and health
- Optimum mineral intake is best attained from a combination of food and supplements

Vitamins:
Vitamins are a group of naturally occurring nutrients found in food and supplements. They are required in the diet for good health, normal metabolic functioning (through playing a part in a variety of energy reactions and acting as coenzymes), growth, recovery, and performance. Although both of these nutrient compounds are found in the body in trace amount (micrograms & milligrams), it doesn’t dismiss the fact that they are essential because the human body either doesn’t make them at all, or does not make them in enough quantities.

Vitamins are classified into two categories:

Fat-Soluble Vitamins:
- **Vitamin A:** is essential for proper vision, plays a role in maintenance of healthy skin, promotes bone growth, has anti-cancer functions, and reduces the risk of acquiring infections in the lungs, eyes, and kidneys
- **Vitamin D:** is essential for normal growth and development and plays a major role in metabolism of calcium and phosphorus to support normal hardening of bone
- **Vitamin E:** involved in normal red blood cell formation and antioxidant activity
• **Vitamin K:** plays a vital role in blood clotting

The Following lists dietary sources of fat-soluble and water soluble vitamins (although other foods contain these similar vitamins, the following foods provide the richest source for that particular vitamin).

• **Vitamin A:** apricots, carrots, cheese, green peas, peaches, pumpkin, skim milk, yogurt, tomatoes, egg yolks
• **Vitamin D:** fish liver oil, eggs, butter, cream, halibut, hearing, liver, mackerel, salmon, sardines, shrimp, sunlight
• **Vitamin E:** vegetable oils such as soybean, corn, cottonseed, peanut and safflower, margarine, wheat germ, nuts, almonds, avocados, guacamole, peanut butter, salmon, sunflower seeds, walnuts, cashews
• **Vitamin K:** green leafy vegetables and small amounts in milk and dairy products, eggs, cereals, fruits, vegetables
• **Vitamin C:** cauliflower, green beans, kiwi, potatoes w/skin, oranges, strawberries, raisins, pineapple, pea pods, radishes, green/yellow peppers
• **Thiamin (B1):** brewers yeast, peas, pork, wheat germ, whole grain pasta, peanuts, beans, organ meats, enriched and fortified grains/cereals
• **Riboflavin (B2):** Brewers yeast, meats, poultry, fish, dairy products, nuts, enriched grain products, green vegetables, broccoli, asparagus, spinach, turnip greens, wheat germ, liver
• **Niacin (B3):** liver, brewers yeast, lean meats, whole grains, nuts, legumes, potatoes
• **Vitamin B6:** chicken, fish, liver, eggs, rice soybeans, bananas, lima beans, peanuts, walnuts
• **Vitamin B12:** primarily animal products such as lamb, beef, herring, mackerel, pork livers, oysters, poultry, clams, eggs, tofu
• **Biotin:** liver, egg yolk, soy flour, bran cereals, yeasts, nuts, cauliflower, milk, legumes
• **Choline:** lecithin, egg yolk, liver soybeans, most fatty foods, meat, whole grains, asparagus, green beans, spinach, wheat germ

**Minerals:**
Minerals are inorganic compounds that the body requires in order to start many of the necessary metabolic reactions and growth and repair. Listed below are the different minerals and their roles in optimum health and performance:
• Phosphorus: involved in bone tissue integrity and the metabolism of fats and carbohydrates
• Iron: part of hemoglobin (carries oxygen to cells)
• Zinc: responsible for many cellular reactions, including the digestion of proteins, testosterone production, and prostate gland function
• Iodine: required for the proper function of the thyroid gland
• Selenium: influences the antioxidant activity in the body
• Copper: important in the formation of connective tissue
• Manganese: required for energy production, aids in bone, and connective tissue formation and facilitates carbohydrate metabolism
• Chromium: is needed as a cofactor for the functioning of insulin
• Molybdenum: involved in energy production, nitrogen metabolism, and uric acid formation
• Fluoride: prevents tooth decay
• Boron: influences calcium, phosphorus, and magnesium metabolism and bone formation
• Vanadium: plays a role in glucose metabolism and is an insulin cofactor

**Electrolytes:**

• Sodium: regulates body fluid balance, plays a role in muscle contraction and nerve impulse transmission
• Chloride: used in control of fluid balance
• Potassium: used in control of fluid balance, nerve transmission and muscle contraction as well as glycogen formation
• Calcium: important to the integrity of bone tissue, nerve conduction, transmission of nerve impulses, normal heart beat, muscle contraction, blood clotting
• Magnesium: has metabolic and structural roles as well as nervous system functioning

Below are a few food choices that will replenish the electrolytes you lose during workouts, practices and games:

• Chocolate milk and a bagel with natural peanut butter (sodium)
• Olives, tomatoes, lettuce, celery (chloride)
• Oranges, melons, raisins, prunes, bananas, sweet potatoes, baked potatoes, spinach, kale, beans, peas, avocados (potassium)
• Milk and cereal, yogurt (calcium)
• Leafy green vegetables such as spinach, broccoli, kale, as well as nuts, natural peanut butter (magnesium)

**Chelated Minerals:**
When purchasing vitamin/mineral supplements, it is always best to buy those that come in the chelated form. Chelated minerals are the dosage form most often recommended to assure proper daily intake. Chelating is the pharmaceutical process of bonding each mineral to an amino acid. This bonding makes it easier to digest and assimilate each nutritive mineral for proper utilization in the body. The word chelate comes from the Greek word *chele* meaning ‘claw’. All minerals are metal and in metal chelates an organic molecule called a ligand binds to a central metal atom through two or more different atoms thus forming a heterocyclic ring. Picture a crab holding something with both its claws – the concept is the same. This form of binding gives the system more stability than simple metal complexes. This type of bonding between a mineral and an organic molecule creates a stable compound. The organic material facilitates absorption while protecting the mineral from antagonists (or anti-metabolites) in early digestive stages. The mineral can then be absorbed more readily at the proper stage of digestion and utilized more efficiently by the body. The degree and integrity of the bond between the metal and the organic material determines the value of the organic mineral product. If the degree of bonding is high, the body utilizes more of the actual mineral content of the supplement and less is excreted in waste product.

**Antioxidants:**
During progressive research on the possible metabolic roles that nutrients may play in addition to prevention of nutrient deficiency disorders, a group of vitamins, minerals, and enzymes called antioxidants have been identified that protect the body form chemical damage. Because ‘free radicals’ damage biomolecules, they are responsible for aging and causing deadly diseases like cancer and other degenerative diseases.

Free radicals are molecules with an unpaired electron that attack other molecules in a quest to obtain a paired electron molecule. When the renegade molecule finds an electron mate, it bonds with it, causing it to have an extra electron and thus forming a ‘free radical’. This new electron makes the molecule highly reactive and a self-perpetuating vicious cycle begins.
Free radicals are created through many different means. Conditions of normal metabolism, radiation, exercise, ozone exposure, carcinogens, and other environmental toxins cause oxygen molecules inside the body to break down. However, as an athlete, our main focus of free radical formation will concentrate on heavy, intense exercise. Because athletes are overexposed to more free radical production due to their intense level of competition and practice, it is very important that every athlete’s diet contain antioxidant nutrients for optimum health.

The free radical attack caused by exercise doesn’t stop when you stop. The hydroxyl-radicals that are formed via exercise continue to injure you long after you stop exercising. Hydroxyl-radicals react with fats inside the muscle cell membranes to make them go rancid. This creates havoc for cell processes leading to pain and inflammation. With every bout of intense exercise you can get inflammatory chain reactions that can last up to 20 hours.

The result of this free radical debacle means that any bout of intense exercise has the potential to leave the athlete sore and unable to reach full potential for up to five days. However, there is a cure. By consuming antioxidants daily through proper diet and supplementation, you will decrease the number of free radicals that are capable of wreaking such havoc and allow yourself to recover faster.

**Free Radicals can cause some of the following:**
- Cancer
- Atherosclerosis
- Emphysema
- Cataracts and Glaucoma
- High blood pressure
- Immune system deficiencies
- Heart disease
- Arthritis
- Stroke

**Some of the key antioxidants:**
- Vitamin A
- Vitamin C
- Vitamin E
- Glutathione
- Green Tea

Eating a wide variety of foods in a balanced diet should give any athlete the proper ratio of nutrients (carbohydrates, protein, fat, vitamins, minerals, water). In addition to proper nutrition, supplementing your diet with a multi vitamin containing a good variety of vitamins and chelated minerals may prove useful considering many foods are stripped of vital nutrients due, in part, to manufacturing and packaging processes in an effort to increase shelf life and disease prevention.

A good vitamin complex should provide minerals in the chelated form to be efficiently utilized by the body and should have a rich supply of various antioxidants. There is no substitute for food. If you normally have a poor food selection, multi vitamins will not be enough to counter the malnutrition you are causing.
Supplementation

It is always best to get all of your vitamins, minerals, amino acids, and protein from natural food sources in your diet. Even though this is what you strive for daily, this is not always possible. If you are finding yourself short on time, or don’t have the resources to eat a well balanced diet, it is a good idea to add some supplements to your daily routine. A few of these include:

**Protein Powder:** can be taken daily to increase size and strength, lose fat, spare muscle, and reduce hunger.

**Branched Chain Amino Acids (BCAAs):** increase protein synthesis, decrease the rate of protein breakdown, increase muscular endurance, improves recovery between workouts, practices, and games.

**Fish Oil:** may help overall health and wellness, supports healthy immune function, supports healthy hair, skin, and nails, supports heart, brain, vision, and joint health.

**Multivitamins:** there is No Substitute for food but taking a daily multivitamin gives you a good safety net and ensures you are not deficient in key vitamins and minerals. Multivitamins may help support a healthy immune system, improve metabolic efficiency, and support bone and tissue health.
Weight Gain Tips

Keeping weight on can be a challenge. Eating enough calories can become a headache and is difficult at times. Maximize your efforts by sneaking in some extra calories, adding protein shakes with a high calorie liquid to your diet, and choosing calorie dense food items. Work hard in the weight room to assure that you will be adding lean muscle mass. When you ingest all these extra calories you need to put the time in the weight room to good use. Otherwise you will be adding fat instead of lean muscle mass and nobody wants that.

- Add wheat germ and/or evaporated milk to soup, gravy, cooked foods, potatoes, protein powder mixed with a high calorie liquid, etc. This will increase the calories, yet hardly alter the taste of food/shakes
- Sauté (not fry) foods using a little olive oil or other unsaturated vegetable oils
- Add nuts, seeds, croutons, and/or raisins to salad, rice, pasta, and other dishes
- Add butter, margarine, jam, peanut butter, and/or other types of spread to breads and rice cakes
- Add or top food with breadcrumbs before baking
- Add beans, corn, and/or potatoes to soups, entrees, and side dishes
- Add honey, nuts, syrup, fruit, wheat germ, or low-fat yogurt to whole wheat waffles and/or pancakes for a calorie dense snack
- Try to familiarize yourself with the calorie counts of certain foods that you target to eat on a daily basis
- Choose calorie dense breakfast cereals like granola or grape-nuts. Try adding sliced fruit or raisins and try adding jam, peanut butter, etc. to toast or bagels
- Add slivered almonds or grated cheese to steamed vegetables and/or salads
- Eat desserts that retain some nutritious value like oatmeal cookies, Fig-Newton’s, fruit cobblers, pudding, pies, and frozen yogurt
- Use carbohydrate / protein supplements as a snack
- Instead of 5-7 meals per day, shoot for 6-8 meals
- Keep saturated fat intake low – no more than 10% of total caloric need
- Make sure you are getting the proper amount of protein each day
• Add high quality vitamins and minerals and BCAAs to supplement your well balanced diet
• Maintain aerobic exercise because it helps burn fat and increase blood flow to muscles

Fat Loss Tips

• Weight train – HARD! Vigorous weight training will maintain or increase lean muscle tissue. Muscle tissue burns more calories than fat; an increase in lean muscle mass in proportion to the athlete’s body weight will allow you the turn more calories, increasing the amount of fat loss.
• Use the 3:2:1 Rule
• **DO NOT starve yourself**
• Eat at least 5-7 smaller meals per day
• Try to eat every 2-3 hours to keep your metabolism working efficiently
• Eat a spinach salad before lunch and dinner
• Drink mostly water
• Get a lot of your carbohydrates from nutrient dense sources like fruits and vegetables
• Never skip meals
• Engage in some sort of aerobic exercise at least 3 times per week
• Keep protein levels up to maximize the thermogenic effect
• Eat high quality proteins that are low in fat content
• Reduce your daily intake of fat to 10%-15%. Look for foods that have less than 2 grams of fat per 100 calories
• Increase dietary fiber to help satisfy hunger
• Eat plenty of vegetables throughout the day, especially non starchy vegetables
• Avoid processed foods and ‘snack foods’. They are usually high in fat, sugar, and sodium
• Do not fry foods in oil or fat. Instead, bake, broil, or microwave foods
• Avoid and/or reduce the use of sauces and condiments that have high fat or sugar content
• **Don’t drink your calories through soda.** Stick with water as your main source of fluid. Seldom switch to sports drinks, juice, or milk
• Don’t eat late night snacks
• Avoid sugar whenever possible
• Consume 1 gallon of water per day
• Monitor body fat on a monthly basis

Importance of Hydration

Whenever your body is short of water, performance drops. Exercise increases body temperature directly proportion to the exercise load. Your body tries to maintain its resting temperature of 98.6°F by moving the extra heat to the skin via the blood. There it dissipates into the air, mainly by evaporation of sweat. Your blood must also carry oxygen and nutrients to the muscles and remove the wastes of muscle metabolism. Available blood is shared between all these tasks. The higher your core temperature rises the more blood is used for cooling and less is available for muscles. The cooler you stay during exercise, short of being cold, the better your muscles will function.

Outside the narrow range of 98°F– 100°F, your body will always sacrifice muscle function for temperature regulation. A decline in muscle function, even to the point of complete immobility, is not life threatening. If core body temperature rises by a mere 9°F, normal biochemistry ceases, which results in death.

Heavy exercise (equivalent to sports of more than about one hour of continuous duration) can increase heat production in muscles to 20 times their normal resting rate. Even with optimum hydration and a cool environment, this heat load can raise your core temperature to 103°F within 15 minutes. Studies show that you can still perform well at this temperature, although you probably will not be at your best.

How do we combat the above metabolism? Drink all liquids as cold as you can stand them to give a reservoir of cold in the gut. Cold water, below 50°F, is absorbed faster than room temperature water and it will absorb considerable body heat. Sip the water instead of gulping it down. Gulping swallows air, which disturbs stomach function and slows absorption.

The same applies to carbonated drinks; the gas slows absorption. Avoid them whenever you can. Almost anything added to water slows absorption. The walls of your intestines are semi-permeable membranes like a very fine
mesh. Water passes through easily but most particles do not. Pure water containing no particles is absorbed rapidly. As soon as you dissolve anything in water, absorption slows.

Many commercial sports drinks contain high levels of glucose, sucrose, or other similar simple sugars. These sugars inhibit absorption; do not use them during exercise. Soft drinks and sodas are even worse due to the fact that most are over 10% simple sugars. If you drink 12 ounces of plain water, 8 ounces will empty from your stomach within 15 minutes. If you drink 12 ounces of 10% sugar solution, less than 1% will empty in the same period.

However, a lesser level of sugar can be helpful. Simple glucose at a 1%-5% solution hardly inhibits stomach emptying and does provide a boost to blood glucose levels. Fructose at 2% enhances stomach-emptying, causes less insulin burst, and helps restore liver glycogen.

How do you get your body back to normal after a tough workout (exercise or sports that last longer than 1 hour in duration)? First, we must look at what has happened to the body during the exercise bout. The body is dehydrated, your stomach is in a highly acidic condition and almost empty, your muscles are loaded with waste from your metabolism, your glycogen stores are depleted, and you are in electrolyte overload because of the percentage of body water lost is much greater than the percentage of body minerals lost.

Re-hydrate immediately by drinking plain cold water. Coax yourself to drink because the thirst response is still inhibited after performance. Avoid juices, especially citrus juices, which inhibit re-hydration because of their high sugar content and only add to stomach acidity. This promotes cramping and nausea. Plain water is always best.

Do not sit down or lie down right after an event, no matter how tough it was. Muscle cramps and post-event injuries often occur because insufficient blood gets to the fatigued muscles to remove wastes. During an active cool down, the muscles of the body act as pumps, which prevent blood pooling and helps keep waste from building up in the fatigued muscles.

Until you reach four 8-ounce glasses of water, avoid any food to ensure quick water absorption. Once your stomach is bathed with water, food is fair game. Every athlete should concentrate on eating high levels of protein and complex carbohydrates – not sodas, beer, or candy bars – 45-60 minutes
following any bout of heavy exercise. Complex carbohydrates are foods like whole grain breads, oatmeal, whole grain pasta, certain fruits, and vegetables. After digestion, carbohydrates are converted to glycogen and used to replenish the glycogen stores in your muscles and liver. Water plays a key role in this process as well. In order to store one gram of glycogen, the body also has to use 2.7 grams of water.

**Every athlete should shoot for roughly 1 gallon of water per day.** With that in mind, it is more realistic for men to drink about 13 cups of water (roughly 3 liters) per day; it is more realistic for women to drink about 9 cups of water (roughly 2 liters) per day. A common problem among many athletes is chronic partial dehydration; the athlete never drinks enough to completely and properly re-hydrate. This is a serious problem due to the fact that most muscle pulls, strains, and cramps occur due to partial or complete dehydration.

Possible Outcomes from being dehydrated:

- Muscle pulls
- Muscle strains
- Muscle tears
- Muscle cramps
- Increased amount of joint pain
- Increased amount of time it takes to recover from each workout/practice/game
- Decreased performance
- Fatigue
- Nausea
- Increased muscle soreness
- Increased chances of getting sick
- Heat exhaustion and/or heat stroke
Hydration Guidelines

Failure to re-hydrate before the next training session will result in decreased strength, power and endurance! Failing to re-hydrate will also increase the risk of fatigue, muscle cramping and injury. Carry a water bottle with you at all times!
General Guidelines for Pre/Post Game Meals

What you eat everyday has an effect on your performance. What you eat right before an event has a critical effect on your performance. Bad food choices can be extremely detrimental to the athlete. Good choices can give any athlete the edge needed to be a champion. However, it is important to remember that pre-game meals will be the most beneficial if the athlete is eating healthy for every meal outside of the competition.

Guidelines athletes should follow for a pre-game meal:

- Eat a meal three hours before an event or game
- Choose a meal that is high in starch. Starches are easily digested and stored as glycogen for energy
- Consume moderate amounts of protein. Proteins take a little longer to digest than starches and too much protein can lead to increased urine production. An increase in urine production can lead to dehydration
- Limit the amounts of fats and oils – not recommended
- Restrict sugary foods. Excess sugar can cause elevated blood sugar levels, which will result in blood sugar plummeting and a decrease in energy during the game
- Avoid caffeine before competitions or games. Caffeine will lead to dehydration
- Drink plenty of fluids with the pre-game meal. Water is best – stay away from carbonated drinks and beverages with high caffeine content and sugar

Post-workout recovery is one of the most crucial steps in assuring you the maximum gains from a training session or the quickest route to recovery. The post-workout meal should be consumed as soon as possible after the workout or game is completed (not more than 45 minutes after). If you fail to ensure that your body can go into recovery mode shortly after, one or more of the following will likely take place: prolonged muscle soreness, poor performance in subsequent training sessions or games, symptoms of over-training (loss of appetite, loss of motivation, inability to sleep, irritability, depression, difficulty concentrating, breakdown of immune system), minimal gains in lean body mass, loss of muscle mass, and a decrease in resting metabolic rate. Great options post workout nutrition includes protein shakes, peanut butter and jelly, and chocolate milk.
To ensure your body gets into recovery mode, it is best to consume a post-workout shake and/or meal that will give you a 3:1 ratio of carbohydrates to protein. Taking this shake and/or meal within 45 minutes of the training session will help the athlete:

- Rapidly replenish low glycogen stores in muscles
- Decrease muscle protein breakdown
- Prompt an increase in muscle protein synthesis

**Grocery Shopping Tips**

- Don’t shop hungry
- Make a list and stick to it
- Shop the perimeter of the grocery store first
- Become a label reader. Check serving size, total calories per serving, total fat per serving, sugar and fiber per serving
- Steer clear of ‘hydrogenated’ oils
- Look for bright and deep colored produce items-they are full of antioxidants, fiber, and nutrients
- Purchase local produce whenever possible. Time, heat, and water are the three things that destroy valuable nutrients. The closer you can eat ‘to the source’ the more nutritious your food will be
- A serving of meat is about the size of a deck of cards
- Double bag raw meat. Don’t let it touch other groceries, especially produce
- Legumes (beans) are an excellent source of protein, along with nuts and seeds
- Eggs are an exceptional protein source
- Eat wild fish whenever possible (ideally 2 times per week)
- Go for low fat or non-fat milks, cheeses, and yogurts whenever possible
- Always check the ‘sell by’ and ‘use by’ dates on packages
- Look on labels of breads, cereals, etc. and make sure the first ingredient on the list is WHOLE grain (not refined, not enriched; the first words need to be WHOLE)
- Make your own trail mix with healthy nuts, seeds, and dried fruit
- Whole grains are full of vitamins, minerals and fiber. Try mixing half of your usual white rice with brown rice, quinoa, or barley
Many of the aisles in the middle of the grocery store contain the lowest nutrient dense food choices, so stay outside the store.

Never buy bulging cans (botulism)

Your best oils are coconut and olive oils. Keep them in a cool dark place such as the refrigerator. Time and heat play a pivotal role in the quality of these products

Stay away from high fat items, especially when they are high in trans fat and/or saturated fats

Beware of high sodium and high sugar

**Biggest Take Away From Grocery Shopping:**
Aim for more natural, colorful, whole foods. These types of foods are more nutrient dense and will be more beneficial to your body. Your body will be ready to compete and be prepared for peak performance. Not only that, but by eating more nutrient dense, natural foods, you’ll be able to recover more efficiently. The less done to your food, the better. Commit yourself as an athlete to participate in proper nutrition and lifestyle choices. The results you get on and off the field will be worth it.

**Alcohol**

The type of alcohol in alcoholic beverages is known as ethanol, which in the human body acts as a depressant. Ethanol is dense in calories and contains zero nutritional value.

Once alcohol enters the body it is quickly absorbed by the stomach and distributed throughout the body through the bloodstream. Brain cells are particularly sensitive to alcohol exposure as immediate and drastic decreases in performance skills, such as reaction time, balance, hand-eye coordination, and visual perception, are seen. Alcohol molecules stay in the blood for up to two weeks.

There are no positive effects of alcohol use. The notion that alcohol has any positive effects on the health of a young athlete is simply a myth. Young people in no way receive health benefits from alcohol, and in fact, increase their risk of death greatly. The immediate, short term, and long term effects of alcohol consumption by any athlete are extremely negative and numerous.
Immediate and short term effects of alcohol:
- Lack of strength (as much as 5%) due to inflammation of muscle tissue
- Decreased endurance
- Increased heart rate and blood pressure
- Impaired body temperature regulation
- Impaired glucose metabolism
- Promotion of body fat storage
- Increased muscle soreness
- Insomnia and loss of REM sleep
- A decrease in the body’s ability to fight infection
- Slower recovery time between workouts/practices/games

Long-term effects of alcohol:
- An increase in the likelihood of developing numerous cancers
- An increase in the likelihood of developing diabetes
- An increase in the likelihood of developing cardiovascular disease
- Psychological depression
- A loss of brain cells and the ability to perform abstract thinking

**Recovery**

Self Myofascial Release (SMR) techniques can increase flexibility, decrease muscular soreness, decrease recovery time, relieve stress, alleviate tension headaches, and improve posture. SMR using a foam roller or other piece of equipment is possible thanks to the principle known as autogenic inhibition. The Golgi tendon organ (GTO) is the key ingredient that makes foam rolling effective. The GTO is a mechanoreceptor found at the muscle tendon junction; it lets us know the level of tension within the muscle/tendon group. When tension increases to the point of high risk of injury, the GTO excites muscle spindles to relax the muscle in question. This reflex relaxation is autogenic inhibition. The muscle contraction that precedes the passive stretch stimulates the GTO causing relaxation that facilitates this passive stretch and allows for a greater range of motion. Foam rolling can stimulate this muscle tension, thus causing the GTO to relax the muscle.

It’s also fairly well known that muscles need to be not only strong, but flexible as well. No matter what sport you participate in, whether it is soccer, baseball, football, power lifting, or just recreational basketball, it’s
important to have strength and optimal function through the full range of motion. Stretching will improve the length of the muscle. SMR and massage work adjust the tone of the muscle.

Traditional stretching techniques cause transient increases in muscle length (assuming that we don’t exceed the ‘point of no return’ on the stress-strain curve, which will lead to unwanted deformities). SMR, on the other hand, offers these benefits and the breakdown of soft-tissue adhesions and scar tissue.

You don’t have to look any further than the overwhelmingly positive results numerous individuals have had with Active Release Techniques (ART) or other deep-tissue modalities to recognize the value of eliminating adhesions and scar tissue. Unfortunately, from both a financial and convenience standpoint, we can’t all expect to get ART or massages done on a regular basis.

SMR on the foam roller offers an effective, inexpensive, and convenient way to both reduce adhesion and scar tissue accumulation and eliminate existing adhesions and scar tissue on a daily basis. It is important to note that like stretching, foam rolling doesn’t yield marked improvements overnight; you’ll need to be diligent and stick with it (although you will notice small benefits right away).

You can purchase tools to help your recovery, such as a foam roller, for as low as $9.95. You can find them on sale in the fitness aisle at Target and Walmart, and even places like Marshall’s and TJ Maxx.

Below are a few websites that sell foam rollers at affordable prices:

http://www.elitefts.net/

http://www.performbetter.com

http://store.sorinex.com
Nutrition: After College

As you start entering the ‘twilight’ of your collegiate career, you will begin to notice some changes. There won’t be anymore structured team workouts and conditioning sessions. Your metabolism will start slowing down. You won’t be able to eat whatever you want and not gain weight. During this whole process it is important to stay active. Find a new hobby and keep doing what you love. Your nutrition habits will begin to change and you should focus more on decreasing your portion sizes, maintaining an active lifestyle and avoid excessive alcohol, smoking, sugary beverage, baked goods and junk type foods. Focus on incorporating lean meats, fruits, vegetables, whole grains and intaking the proper amount of water.

Refer to page seven in this manual about daily caloric intake and activity level. You will no longer have too many ‘very active’ or ‘extremely active’ days. Use this more practical activity level scale below when you are no longer competing:

Sedentary-completely off, no physical activity, lounging around
Lightly Active-normal daily activities without any organized exercise
Moderately Active-normal daily activities with organized exercise

Again, when your playing days are over you will likely fall into the sedentary, lightly active, and moderately active categories. At this time it is beneficial to focus on non-exercise physical activity (NEPA). This may include going for a jog in the neighborhood, gardening, laundry, playing with kids, etc. Try to get physical activity through activities of daily living.
References

Academy of Nutrition and Dietetics. Fueling Track and Field Athletes.

Authority Nutrition- http://authoritynutrition.com/


Smart Nutrition Starts Here- [http://www.nutrition.gov/](http://www.nutrition.gov/)

The 10 Nutrition Rules to Live By- [http://www.usoccer.com/stories/2014/03/17/12/34/10-nutrition-rules](http://www.usoccer.com/stories/2014/03/17/12/34/10-nutrition-rules)