Lafayette Sports Medicine

Nutrition Handbook

The sports medicine staff at Lafayette College is dedicated to providing the highest quality of service to all athletes. Since it is widely known that one's nutrition status not only impacts overall health but also performance we feel that it is of the utmost importance to address appropriate nutrition issues for you – the student athlete at Lafayette College.

This handbook contains current nutrition information and recommendations. The goal of this handbook is to allow each student athlete to achieve an optimal nutrition status which will have a positive impact on their performance. Part of this impact is to assist each athlete in injury prevention and, if needed, aid in improved healing from any athletic injury through achieving optimal nutrition status.

Please keep this nutrition handbook for all of your years here at Lafayette College. The Sports Medicine staff will always be available to answer your questions and will look forward to working with you during your years at Lafayette!

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Nutrition Comes From Nutrients

In almost any source today one can read about the roles of nutrition with regard to our health as well as performance. However, just as easily as we can find this reputable information, there always seem to be more readily accessible sources in the public that print erroneous, unproven and harmful nutrition information to society.

One of the largest areas of public interest is "dieting". However, an actual definition of diet per Webster's New World Dictionary is "what a person or animal usually eats and drinks; daily fare". If we focus on and use this definition to guide our "diet" then we can achieve a healthy nutrition status, healthy body, healthy weight, and optimal performance by focusing on what we eat every day – not what we don't eat!!

Based on studied aspects of nutritional sciences we do know that this diet should contain a balance of energy nutrients coming from carbohydrates, fats, and protein as well as appropriate levels of vitamins, minerals, and last but certainly not least adequate hydration with water. These six are our essential nutrients (carbohydrates, fats, proteins, vitamins, minerals, and water). "Essential", our body will not function properly without them. Optimizing this balance will not only impact your overall health but impact your athletic performance. This is achieved through addressing each individual cell's requirements for proper function. Muscle cells are a great example of the multiple functional requirements that are optimized through a balance of daily food and drink intakes. For example, muscle cells are approximately 75% water and will not function with an efficient metabolism if dehydrated. This can be seen in sweating when loses in cellular water levels lead to muscle cramping which in turn inhibits performance by leaving the muscle immovable and unable to perform at optimal levels. The Gatorade Sports Science Institute has proven that 1-2% dehydration can decrease one's performance by 2-5%. In most sports where wins or losses can be measured by seconds this level of performance loss can be a large difference between a win and a loss.

The three energy nutrients, meaning they contain calories or energy, are carbohydrates, fats, and proteins. Below is a general explanation of or each nutrient.

Carbohydrates

Carbohydrates are one's prime source of immediate energy. There are two main forms of carbohydrates in our foods: simple and complex. Simple carbohydrates can be related to as sugars. A simple sugar impacts our energy level very quickly (see glycemic index) and is best consumed prior to increased activity. A complex carbohydrate can be related to as a starch and is usually affiliated with higher level of fiber, proteins, and nutrients. These carbohydrates are best used throughout your day and provide the best means to keep your energy levels at desirable levels.

After any carbohydrates are consumed they are converted into the main body carbohydrate - glucose. Glucose travels to all of our cells that require it for energy through our blood stream. Upon reaching a body cell which requires energy, the glucose is taken into the cell and is either used or stored. The only cells which can store the glucose are muscle cells and liver cells. The storage form of glucose is glycogen. In relation to performance, if a muscle cell does not have enough energy (glycogen) to work then it will not achieve optimal performance. Some athlete term this "hitting the wall" when you legs feel heavy and it is hard to keep your body moving.

An average person can only store approximately 1800 calories of carbohydrates, whereas there is a storage level of 60,000 to 80,000 calories o fats which can be stored in our

body. This makes carbohydrates our limiting factor for performance. If you run out of energy any time then it is all about carbohydrate balance!!

The best sources for carbohydrates are whole grains, starchy vegetables, beans/legumes, fruits and low-fat dairy sources.

Glycemic Index

Carbohydrates can be ranked based upon how fast or slow they produce an impact to our blood sugar levels. White bread with a score of 100 is the standard to which other carbohydrates are compared. The ranking they receive can be higher or lower than 100. High glycemic index foods (85 or more) will produce a rapid rise to your blood sugars while low index foods (60 or less) only produce a small rise in this measure. For athletes, this knowledge can be a valuable tool to optimize your energy at times or practice or competition. Based upon these principles, low index foods should be consumed at all times except for within 2 hours prior to activity. High index foods contain more simple sugars or refined grains and achieve a more immediate increase to energy and are best consumed within 2 hours before or after a workout.

High Glycemic Index Foods

- Raisins
- Potatoes
- Molasses
- Cheerios
- Cream of Wheat
- Watermelon
- Ice Cream

Low Glycemic Index Foods

- Milk, Yogurt
- Spaghetti
- Beans
- Peanuts
- Bran
- Lentils

As a note, since protein and fats digest more slowly than carbohydrates – eating protein or fats with a high index carbohydrate will make them slower to digest and decrease immediate impacts to energy. (Example: apple with peanut butter)

Fats

This nutrient has the functional role of providing our body long term energy. If fats were money then they could be considered our energy gold! There are three main forms of dietary fats: saturated fats, polyunsaturated fats, and monounsaturated fats. Saturated fats are primarily found in animal products but also include coconut oil, palm kernel oil and trans-fats. These are the fats which can increase one's risks for poor health conditions such as arterial disease, heart disease, high cholesterol, and others. These fats should be limited in our dietary intakes. The two unsaturated fats are found in plant products and are considered the healthy fats for our dietary consumption. An example of a monounsaturated fat is olive oil or olives and a polyunsaturated fat is canola oil.

During bouts of exercise our body will have slightly elevated levels of fats burning, however this does not increase as greatly as many people think. Our individual fat burning

level is fairly even throughout our day. If our muscles are working harder (and at higher intensities) we have to remember that they are primarily using up more and more muscle glycogen. The only thing that will more dramatically increase our fat burning is increasing the duration of our activities, not intensity.

Proteins

This last energy nutrient has a primary function of structure. Protein is our main building component for all body cells. However, since protein also has calories/energy it is our body's third source for needed energy. Also, since it has energy/calories, if one consumes more protein than body requirements, this energy can be stored as body fat. For that matter, any of these energy nutrients can be stored as body fat if consumed beyond our body's needs.

In our energy metabolism, we now know that carbohydrates are burned first and fats provide the valuable back up to those carbohydrates. Since fats are our "gold" energy they are not indispensable at any level. When energy requirements become very severe, proteins are used to spare some of our valuable "gold". This is called protein wasting. This would be a very large negative to an athlete since lean mass/muscle cells are one's strength, power, speed, and overall performance factors.

The best sources for protein include lean meats, poultry, fish and seafood, low-fat dairy products, beans, and nuts/seeds.

NUTRIENT	CALORIE COMPOSITION
Carbohydrates	**55-65% or total calories**
Simple	*10% of total carbohydrates*
Complex	*90% of total carbohydrates*
Fats	**20-30% of toal calories**
Saturated	*7-10% of total fats*
Monounsaturated	*10% of total fats*
Polyunsaturated	*10% of total fats*
Proteins	**12-15% of total calories**

Relationship Between Health, Performance, and Healing

Another example of the importance of a balanced diet is the cellular healing process. As an athlete there may be a time when you sprain a ligament or strain a muscle. The body's job in this case is to heal. However, healing can only occur when the cell has adequate amounts of structural materials to build the injured area back (i.e. protein and lipids), as well as sufficient energy to allow for the healing process to occur (i.e. carbohydrates and fats). As another example, if we achieve adequate dietary calcium intakes our bones should be at optimal bone mass. Achieving this level would decrease one's risk for stress fractures. In general, research has shown us that most injuries occur when an athlete is reaching stages of fatigue. Fatigue can be acute, such as being tired at the end of a game, as well as chronic or long term, such as illness. Through what we know about our body's needs and each cells functional requirement for specific nutrients we do know that fatigue can be prevented by addressing our body's needs.

All nutrients are important for our overall health; however these select nutrients play a larger role when you are moving through the healing process after an injury.

Vitamin A: This vitamin has many functions and one of those is new cell growth and increases cell defenses against infection. These functions make Vitamin A , a must have for the inured athlete, however, be careful with supplementation. Vitamin A is fat soluble, which means that any excesses can be stored and build to harmful levels. It is always best to focus on getting sufficient levels of vitamins and minerals from our natural food sources.

B-complex: This group of vitamins includes: thiamin, niacin, riboflavin, B-6, B-12 are involved with every aspect of cellular metabolism. A cell is not going to produce optimal level of ATP (our cells energy output) without these vitamins. They are the keys to energy output and without them we would not be able to meet our energy needs, thus fatigue.

Vitamin C: This vitamin has many essential functions: formation of scar tissue and connective tissue, iron absorption (energy), bone growth and repair, as well as an antioxidant which helps increase immune function. By ensuring adequate intake of vitamin C you may be doing one of the most important things to prevent any illness/injury or speed up your healing process.

Carbohydrates/Energy: Healing is an energy process! Your metabolism will actually increase, as much as 50%, as it try's to heal tissues after significant injury. And, carbohydrates are one's best immediate energy source. So, the bottom line is - carbohydrates will be your injuries best resource for healing. You cannot build a house without the energy from the workers and your body is not going to build new tissues without proper energy balance from the foods in your daily diet. Not consuming adequate carbohydrates could leave your body slow to build muscle as well as slower to repair your injury! This translates into time lost from sport participation.

Vitamin E: This vitamin is one of the most powerful antioxidants and physicians routinely recommend Vitamin E supplementation of 400IU/day for individuals with heart disease because it preserves our red blood cells from free radical damage and allows for greater maintenance of red blood cells in our circulation to feed our muscles oxygen.

Protein: Protein is the equivalent of the building materials if you were building a house. Protein provides us with the essential structural components if we are looking to build or rebuild any type of tissue, including muscle and connective tissues.

Zinc: As an essential mineral, zinc is directly involved with cell growth, which greatly impacts wound healing and new cell development/repair.

NUTRIENT	BEST FOOD SOURCES
Vitamin A	Red, yellow and orange vegetables (peppers, squash, carrots, sweet potato, cantaloupe), egg yolks, milk
B-Complex	Leafy green vegetables, lean meats, low-fat milk/dairy products, eggs, beans
Carbohydrates	Whole grains, starchy vegetables, dairy products, fruits
Vitamin C	Citrus fruits, papaya, green peppers, strawberries
Vitamin E	Vegetable oils, leafy-green vegetables, wheat germ, and whole grain products
Protein	Low-fat dairy products, lean meats, starchy vegetables, eggs, fish/seafood, beans, tofu/soy
Zinc	Red meats, chicken, lentils, almonds, chick-peas, and low-fat dairy products

Meal Spacing Guidelines

Morning Activity

Night Before:	High carbohydrate meal (moderate/low glycemic index foods) Sufficient fluid intakes to maintain hydration; If not panning breakfast in AM, eat late night snack of low/moderate glycemic index foods;
Morning of:	Light breakfast of moderate to low glycemic index foods; Allow at least 2 hours for food to digest; If not breakfast, eat snack (high) 1-2 hours before activity;
After activity:	Always consume high glycemic index foods of at least 200-400 calories within one hour of activity; Replace fluid losses (20 fl oz. water for every pound lost)

Afternoon Activity

Night Before:	High carbohydrate snack before bed of moderate/low glycemic index foods; Sufficient fluid intakes to maintain hydration;
Day of:	Eat hearty breakfast with high carbohydrate foods (moderate to low) and lighter lunch; Allow at least 4 hours before activity; High carbohydrate snack at least 2 hours prior to activity (high index foods); Allow at least 2 hours before activity; Sufficient fluid intakes to maintain hydration;
After activity:	Always consume high glycemic index foods of at least 200-400; calories within one hour of activity; Replace fluid losses (20 fl oz. water for every pound lost)

Evening Activity

Night Before:	High carbohydrate meal (moderate/low glycemic index foods); Sufficient fluid intakes to maintain hydration
Day of:	Eat hearty breakfast with high carbohydrate foods as well as a hearty lunch (moderate to low index foods); Allow at least 4 hours before activity; Eat a light meal/snacks at least 2-3 hours before the event (moderate to high index foods); Sufficient fluid intakes to maintain hydration
After activity:	Always consume high glycemic index foods of at least 200-400 calories within one hour of activity; Replace fluid losses (20 fl oz. water for every pound lost)

References:

Eat to Compete. Chapter 4: Protocols for Developing Diets and Meal Plans; Timing Meals with Event Protocol, pages 136-37.

Gatorade Sports Science Institute. Sports Science Exchange: Roundtable; "Sports Foods for Athletes: What Works?" Volume 9(1998) number 2.

Choosing Foods for Performance

The chart below will help you when making general food choices to optimize your performance. From prior information you know that decreasing intakes of sugars while increasing fiber is ideal for grains. Also, controlling levels of fats would be prudent for health and performance.

The foods listed below are split into three categories based upon their fiber verses sugar content as well as overall fat content. Choose the foods that will best fuel your engine!!

Edsel – Foods that will slow you down!! Try to limit or totally avoid these foods since they are high in fat and/or sugars.

- Biscuits, Croissants, Danish, Donuts, Muffins
- French fries, hash browns, onion rings
- Alfredo pasta, fried rice
- Regular crackers, croutons, potato chips
- Cookies, cakes with frosting, pies, regular ice cream, milk shakes
- Marbled red meats, corned beef, ribs, breaded/fried meats, hot dogs, sausage/bacon, pepperoni and bologna
- Whole milk, high fat cheese (brick)
- Cream cheese, sour cream
- Mayonnaise, butter, alfredo sauce, Hollandaise sauce, regular salad dressing

Taurus – These foods contain some levels of fats and sugars and would be o.k. to use occasionally.

- Corn bread, low-fat muffins, French toast, quick breads (banana/pumpkin/zucchini), pancakes, waffles, tortillas
- Reduced fat crackers
- Stuffing
- Oatmeal raisin cookies, yellow/white cake without frosting, pudding
- Whole eggs, lean red meats and pork (round and loin cuts), Reduced fat cheese, Romano cheese/Parmesan cheese
- Low-fat sour cream, Low-fat mayonnaise, light dressings, olive oil, canola oil, ketchup

Mercedes- These foods will really help you reach the highest levels of performance and health. Use these foods daily for the highest levels of fiber and/or low to no sugar content.

- Bagels, English muffins, breads/rolls preferably whole wheat, rye, grain), Cheerios, Cream of Wheat, oatmeal, pasta, rice, baked potato/sweet potato, pita bread, tortillas
- Pretzels. Animal crackers, Newtons, ginger snaps, rye crisps
- Angel food cake, frozen yogurt
- Egg whites, beans, skinless poultry, fish, seafood/shellfish, tuna, tofu, Canadian bacon
- Skim and 1% milk, yogurt, cottage cheese, part-skim ricotta cheese, part-skim mozzarella/string cheese
- Fresh, frozen or canned vegetables, vegetable juice
- All fresh, frozen, or canned fruits (canned in juice or water), dried fruit, baked apples
- Mustard, Cooking spray, salsa, steak sauce

Need more help in picking a performance enhancing snack? Rely on the following:

- Cereal with 1% or skim milk, such as Basic 4, Cheerios, Shredded wheat, Total, and Wheaties – just to name a few. Cereal bars also work well.
- Trail mix you can make with dried fruits, low-fat granola, Cheerios, nuts, pretzel pieces, bagel chips…
- Whole grain crackers such as rye crisps, sesame thins, Wasa, and kavli…
- Any type of fresh fruit…
- Low-fat dairy choices such as yogurt, cottage cheese, pudding cups.

Eating On The Road

Any athlete will experience the game or event on the road. Due to the long travel often involved and desire to keep things "quick", a majority of teams opt to stop at fast food options for their post game or travel meals. Though one may cringe and think that their nutritional status is going out he window – there are often choices that can be made while still keeping up your nutritional status for recovery and performance.

Some recent good news about fast food options is the expanding menus at most establishments. Due to a high level of health concerns for a majority of the population, most restaurants (fast food and chains) are creating "healthier" alternatives to their typical menus. However, the concerns of eating out still apply: portions which are too large and high levels of fat content.

The larger than desirable portions would usually be thought to just be causing us to eat too many calories. This may definitely be true but when a majority of the calories are from proteins and fats (for example a chicken sandwich) then there may also be a decrease to how much muscle glycogen resynthesis takes place in recovery after activity. Carbohydrates are the preferred fuel for recovery however would not be the primary or even secondary fuel source in this chicken sandwich example.

Also, if a tam is eating on the road before an event, proteins nad fats require longer digestion time than carbohydrates and may slow down your performance if consumed too closely to competition time. You may feel heavy, sluggish, and even experience stomach upset.

So, when eating at a fast food establishment or restaurant, try to follow the following guidelines:

- Allow ample time for digestion when eating before and event (at least 4 hours before activity)
- Have your recovery fuel within one hour after ending your activity
- Adjust your portions in conjunction with your needs – Super size not needed!!
- Ask for all sauces or gravies on the side as to control your own portions
- Use a low-fat or low-calorie salad dressing
- Limit your order to one fried food per meal
- Choose pizzas with thinner crusts and vegetables or lean meats
- Hold the cheese

Follow the charts on the following page to helpguide your food choices when eating on the road!!

NEEDS HELP	BETTER	BEST
Arby's		
Philly Beef and Swiss	Beef & Cheddar	Arby's Melt with Cheddar
Chicken Bacon & Swiss	Chicken Breast Fillet	Regular Roast beef
Turkey Sub	Roast Chicken Club	Grilled Chicken Deluxe
All Market Fresh Sandwiches	Hot Ham & Swiss	French Dip
Chicken Finger Salad	2 Potato Cakes	Light Sandwiches (all)
Jalapeno Bites	Homestyle fries (small)	All salads (except chicken finger)
Cheddar Curly Fries	Cherry Turnover	Arby's Sauce packet
Homestyle Fries	Apple Turnover	BBQ Dipping Sauce
Mozzarella Sticks	Honey Mustard Sauce	Bronco Berry Sauce
Onion Petals	BBQ Vinaigrette Dressing	Horsey Sauce Packet
Deluxe Baked potato	Shakes	Marinara Sauce
Broccoli N Cheddar potato		Sourdough with Ham
Burger King		
Whopper	Whopper with cheese	Whopper w/o mayo
Bacon Double Cheeseburger	Double Hamburger	BK Broiler Chicken w/o mayo
BK Fish Sandwich	Chicken tenders sandwich	Chicken Tenders
Chicken Sandwich	French fries (small)	
French Fries	Onion Rings (medium)	
Onion Rings	Mozzarella Sticks (4)	
Cini-minis	Dutch Apple Pie	
Any Croissan'wich	Biscuit	
Any Biscuit sandwich	Hash Brown Rounds (sml)	
French Toast sticks		
McDonalds		
Big Mac	Chicken McNuggets (9)	Hamburger
Big N' Tasty	Quarter Pounder with Cheese	Quarter Pounder
French Fries (med/lrg)	Filet O' Fish	Chicken McGrill
Ranch Dressing	Crispy Chicken	Chef Salad
McFlurry	Caesar Dressing	Garden Salad
Sausage McMuffin	Chocolate Chip cookies	Hash Browns
Sausage Biscuit	Hot Fudge Sundae	Fruit & Yogurt Parfait
All Bagel sandwiches	Baked Apple Pie	RF Vanilla Cone
Hotcakes with marg & syrup	Sausage Breakfast burrito	Strawberry Sundae
Cheese Danish	Egg McMuffin	Small Shakes
Cinnamon Roll	McGriddles	LF Apple Bran Muffin
	2 Scrambled Eggs	English Muffin
	Sausage Patty	Plain Hot Cakes
	Apple Danish	Fruit & Walnut Salad

NEEDS HELP	BETTER	BEST
Pizza Hut		
Hand Tossed	**Hand Tossed**	**Hand tossed**
Pork, Sausage	Pepperoni	Cheese, Ham, Veggies
Meat Lovers	Supreme	Pepperoni Lovers
Beef	Super Supreme	Chicken Supreme
Thin N' Crispy	**Thin N' Crispy**	**Thin N' Crispy**
Sausage	Pepperoni Lovers	Cheese, Ham, Veggies
Meat Lovers	Supreme	Pepperoni lovers
	Super Supreme	Chicken Supreme
	Pork, Beef	
Stuffed Crust		
All items		
Twisted Crust		
All items		
Pan Pizza	**Pan Pizza**	
Beef, Pork, Supreme	Ham, Cheese	
Meat Lovers	Pepperoni	
Pepperoni Lovers	Chicken Supreme	
Sausage	Veggie Lovers	
Entrees	**Entrees**	
Spaghetti with marinara	Spaghetti with meatballs	
Cavatini	Supreme Sandwich	
Ham and Cheese Sandwich		
Subway		
6" Caesar Italian BMT	All Breakfast Sandwiches	All 6" subs
	Peanut Butter Cookie	(except Meatball and BMT)
	Sugar Cookie	All Under Six Salads
	White Macadamia Nut	Chocolate Chip Cookie
		Oatmeal Raisin Cookie
Wendy's		
Big Bacon Classic	Broccoli & Cheese Potato	All sandwiches
Blue Cheese Dressing	Crispy chicken nuggets (5)	(except Big Bacon Classic)
Bacon & Cheese Potato	Medium Frosty	Side Salad
Medium Fries		Deluxe Garden Salad
Biggie Fries		Breadstick
All regular salad dressings		Plain potato
		Sour cream & Chive potatoes
		Chili
		Frosty (small)

Reference: Bonci, Leslie. "Fueling With Fast Food" Training & Conditioning. December 2001: 33-43.

The Importance of Proper Hydration

For athletes who are concerned with their nutritional status there is much time spent on their food intakes. Fluid intakes are often overlooked when they should often be the first thing considered. Every cell in our body requires fluid for appropriate cell metabolism and all lean mass cells contain about 75% water.

Dehydration is loss of cellular water. The effects of dehydration can be felt within the first hour of exercise (or even sooner) if an athlete is dehydrated upon entering their training or conditioning session. When dehydration exceeds 2% of current body weight one's performance can decrease by 48% - a dramatic increase!! Even greater levels of dehydration, more than 3% of current body weight, will increase one's risk of developing an exertional heat illness such as heat cramps, heat exhaustion and/or heat stroke. The warning signs of dehydration include: thirst, irritability, headache, weakness, dizziness, cramps, nausea, and decreased performance.

So, what should an athlete drink during training or conditioning sessions? Water would be the fluid of choice for daily consumption. For training sessions lasting greater than 45minutes, fluids with a carbohydrate concentration of about 6-8% can achieve optimal rehydration while supplying needed carbohydrates for muscle energy. Fruit juices, sodas, milk, some sports drinks, shakes, and carbohydrate gels usually have a carbohydrate level greater than 8% and are not recommended during exercise. The greater the need for digestion the more water is required to complete the digestion process. When water is pulled into the gut for digestion it is being sacrificed from your muscles and performance can be negatively affected.

Sodium and Potassium

Electrolyte balance is a key component of cellular hydration. Electrolytes are those elements which cross the cellular membrane and are the keys to fluid transportation in and out of the cell. Much attention is paid to potassium when the topic of dehydration and muscle cramping comes up in conversation. However, sodium is very essential and should be considered just as much as potassium in the role of rehydration and optimal muscle cell function.

If you experience muscle cramps frequently, you should salt foods liberally, especially during high times of energy output and sweating –such as high humidity, two a days, and extended practices. Athletes should also choose salty snacks such as pretzels or choose pickles with their sandwiches. High potassium foods include baked potatoes, bananas, orange juice, and tomatoes.

NATA Hydration Guidelines

Before Exercise	During Exercise	After Exercise
2-3 Hours before drink	Every 10-20 minutes	Within 2 Hours
20 fl. oz	Drink 7-10 fl. oz	Replace Any "Weight" Lost with 20 fl. oz per pound lost
10-20 minutes before		Within 6 Hours
7-10 fl. oz	Drink Beyond Thirst!!	Add 25-50% more than weight lost from exercise

Reference: Casa, D. et al. *Journal of Athletic Training* 35(2): 212-224, 2000.

Weight Loss and Weight Gain

Weight Loss

In general, weight is a balance between your calories consumed and calories expended. The areas that impact this equation include age, height, gender, weight, and activity level. There are occasions when weight loss is appropriate for some athletes; however this should be evaluated by your sports medicine tam prior to initiating any weight loss program.

For the average athlete to lose 1 pound of bodyweight per week, they would have to deficit 500 calories per day. This deficit can come from either a decrease in caloric intake and/or an increase in daily activity. Weight loss is definitely more successful when exercise and calorie balance are used together!!

Weight Gain

The opposite side of the previous equation is that an additional (approximately) 500 calories per day. However, weight gain strategies can often require more calories than this due to the demands of building structural protein/muscles which require/burn additional calories. Meaning for every pound of weight gain there will be additional calories required to maintain that pound. Some keys to gaining weight include: an appropriate strength training regimen, consumption of at least 500-1000 additional calories, adequate carbohydrate consumption, more than 6 meals mad nsacks per day (never skipping breakfast!!) and overall consistency.

When discussing the topic of weight gain, most athletes may think that proteins are the key to weight gain success. However, carbohydrate balance remains the key to our cellular metabolism and this holds true for successful weight gain. We know that any excess amount of an energy nutrient (carbohydrates, proteins, or fats) will be stored as body fat if not used functionally. Most all individuals can adequately achieve appropriate protein intakes with their daily intakes. The energy nutrient most often lacking for appropriate muscle building is the all important carbohydrate. Think of proteins as the structural components of the car. You can have many pieces large and small that create the best car in the world – however, if you do not have the gas for the finished engine then you car is not going to work!!!

Body Composition

Definitely more important than weight is one's body composition. Our weight is made up of three components: lean mass (muscle), body fat and body water. Our body water should be maintained at a level to achieve 50-60% hydration for women and 60-70% hydration for men. The component of body fat should not be very variable for most segments of the population and it is more crucial to maintain a certain level for general body health. Lastly, lean mass (muscle) is the most variable mass for athletes and will evidently lead to an overall higher weight for athletes than the general population. However, this "weight" is also associated with an athletes speed, power, strength, and overall performance.

Optimal Body Composition

	Women	Men
Essential	**12-13%**	**3-5%**
Healthy	**17-24%**	**11-15%**

Female Athlete Triad

The female athlete triad is the occurrence of three things in the following order; an energy deficit which leads to amenorrhea and lastly the development of osteoporosis. Female athletes who do not consume sufficient calories to match their energy needs are at risk.

Energy Deficit

The energy deficit which starts this triad may occur on purpose through calorie restriction on just by fault of not meeting calorie/energy balance especially during times of high activity levels. No matter how this deficit occurs it is the trigger for a landslide of health risks.

A measure of the energy deficit can often be one's body fat percentage. Menstrual cycles can be disrupted when one's body fat percentage drops below 17%. However, the rule of thumb is that a regular menstrual cycle determines health not an individual body composition measure.

Amenorrhea

Amenorrhea is the loss of regular menstrual cycles. This occurs in the triad when there is not sufficient energy to run the cycle and insufficient nutritional building blocks to support the production of hormones such as estrogen.

It is very important for women of all ages to track their menstrual cycles. Keeping track of your monthly menstrual cycle will ensure that you recognize any differences which occur. This is very important especially at times for transition with exercise frequency or intensity. Any differences in lighter cycles or increased number of days between monthly cycles can be a signal of failing energy balance.

Osteoporosis

If amenorrhea occurs and the production of estrogen is disrupted this can lead to osteoporosis. Osteoporosis occurs naturally in life as a woman's level of estrogen decreases during the time of life period menopause. In this case, the lack of estrogen causes a sort of early menopause. This occurs because estrogen is crucial for the deposition of calcium in our bones.

Reversing the Triad

To reverse the progression of the female athlete triad one can use a combination of the following: decrease overall activity by 10-20%, increase daily nutrient intakes per body needs, use calcium supplementation of 1500mg per day, and track menstrual cycles.

If the triad is allowed to progress, and is not reversed in sufficient time, the largest risk factor for female athletes is the development of stress fractures. Only a bone density scan would determine the presence of osteoporosis or osteopenia, the early stages of bone loss.

Eating Disorders

It is imperative as a teammate that if you suspect an eating disorder that you notify the appropriate personnel. Please contact your coach, team certified athletic trainer and/or Dawn Schleiden if you suspect an eating disorder of any kind. All information will be taken in confidence.

Nutritional Supplements

The nutritional supplement industry is a multi-billion dollar market and targets practically everyone. This came about after 1994 when the Dietary Supplement Health and Education Act (DSHEA) allow. They are not held up to the same standards or testing as drugs and this puts many safety issues on the table. As for the NCAA, as an organization they do have regulations regarding which supplements are permissible. Their official position is to "Neither recommend nor condone the use of nutritional supplements". However they do follow two standards: the NCAA Banned Substances List and the current NCAA Dietary Supplement Legislation as follows:

Proposal 99-72

Housing and Meals – Nutritional Supplements

16.5.2.3 Nutritional Supplements. An institution may provide only non-muscle building nutritional supplements to a student-athlete at any time for the purpose of providing additional calories and electrolytes, provided the supplement does not contain any NCAA banned substances

The NCAA states that the following Sport Foods/Supplements are permissible:

- Multivitamin/mineral
- Energy bars with <30% protein
- Calorie replacing drinks
- Electrolyte replacing drinks

The NCAA Banned Substances List can be found in full text at the NCAA web site:
www.ncaa.org

The NCAA statistics show that 1-3% of all drug tests are positive. They also follow a very strict policy on positive drug tests and virtually have no second chances for those who do test positive. On this list there are five categories of banned substances. These include stimulants, anabolic agents, substances banned for specific sport, diuretics, street drugs, and peptide hormones and analogues.

Please consult your Sports Medicine team prior to trying/initiating any supplement use. Do not be fooled by the term natural and make sure you look before you leap!!

www.MayoClinic.com
www.acsm.org
www.supplementwatch.com
www.consumerlab.com *seal of approval
www.ncaa.org
www.gssiweb.com
www.nsca.org
www.drugfreesport.com
Dietary Supplement Resource Exchange Center

"Use of dietary supplements is completely at the athlete's own risk"

Guidelines For The Use Of Sport Foods

Electrolyte Replacement

Characteristics:	6-8% carbohydrates
	Multiple carbohydrates with high glycemic index
Before Activity:	Beneficial to increase glycogen stores
	16fl oz. within one hour of activity
During Activity:	4-8fl oz. every 15-20 minutes
After activity:	20 fl oz. per pound of weight loss

High Carbohydrate Energy Drinks

Characteristics:	Greater than 13% carbohydrates
	Usually supplemented with B-Vitamins
	Avoid those with herbs
Before Activity:	16fl oz. 2-5 hours prior to activity
During Activity:	Not beneficial due to the need for digestion
After activity:	Immediately after activity as recovery fuel (200-400 calories within one hour after activity)

Sports Bars (Less than 30% protein)

Characteristics:	Contain greater than 70% carbohydrates
	High glycemic index
	Minimal fat content
Before Activity:	Efficient at least 2 hours prior to activity
During Activity:	Not beneficial due to the need for digestion
After activity:	Efficient as recovery fuel (200-400 calories within one hour after activity)

Shakes (such as Go)

Characteristics:	Contain greater than 60% carbohydrates
	High glycemic index
	Fat should not exceed 25% of total calories
	Protein not to exceed 15-20% of total calories
Before Activity:	16 fl oz. 2-5 hours prior to activity
During Activity:	Not beneficial due to the need for digestion
After activity:	Efficient as recovery fuel (200-400 calories within one hour after activity)

Energy Gels

Characteristics:	Contain greater than 50% carbohydrates
	Avoid those with herbs
Before Activity:	1 packet prior to event
	Consume adequate fluid to ensure absorption
During Activity:	Maintain adequate fluid intake
	At most, enough to supply 30-60 grams carbohydrate per hour
After activity:	Efficient as recovery fuel (1g per kg body weight)