****

**Nutrition and Health**

• Those who practice nutritional habits have a reduced chance of injury and illness by maintaining a higher standard of healthy living

* Good nutrition is necessary for the growth, repair, and maintenance of all tissues as well as regulation of body processes and production of energy.
* Nutrients are categorized into six categories:
	+ Carbohydrates (50-60% of calories)
	+ Fats (lipids) (25-30% of calories
	+ Proteins (15-20% of calories)
	+ Water
	+ Vitamins
	+ Minerals
* **Red** items are considered macronutrients which are the absorbable components of food.
* **Black** items are micronutrients which are necessary for regulating normal body functions.
* Micronutrients don’t provide energy but without micronutrients, macronutrients can’t provide energy.
* **Energy Sources**
	+ **Carbohydrates**
		- Body’s most efficient source of energy
		- Simple or complex sugars, less than 15% of the body’s total caloric intake Starches- body’s principle source of glucose, also provides vitamins and minerals
		- Fiber- believed to reduce colon cancer and coronary artery disease, blood cholesterol levels, and lowered incidents of obesity, constipation, colitis, appendicitis, and diabetes (25g per day)
	+ **Fats**
		- Most concentrated source of energy
		- Should be less than 30% of total calories
		- 95% of fat consumed are triglycerides
	+ **Proteins**
		- Make up major structural component of the body
		- Needed for growth, maintenance, and repair of tissues
		- Needed to make enzymes, hormones, and antibodies that help fight infection
		- Body doesn’t like to rely on them for energy, should be about 12-15% of total diet
		- Made up of amino acids (essential amino acids are ones that are obtained through diet)
		- Many athletes consume more than 2x the amount of protein that they need
	+ **Vitamins**
		- Required in extremely small amounts
		- Regulators of body processes
		- Fat soluble (dissolved in fats and stored in the body) vs. water-soluble vitamins (dissolved in watery solutions and not stored)
		- Vitamins A, D, E, and K are **fat soluble**
		- Antioxidants may prevent premature aging, certain cancers, heart disease, and other health problems
		- Vitamin deficiency may occur if you don’t obtain all essential vitamins
	+ **Minerals**
		- Must be supplied in the diet because more than 20 minerals have a role in body function
		- Most minerals stored in the liver and bones
		- Calcium- bone and teeth formation, blood clotting, muscle contraction, nerve function
		- Phosphorus- skeletal development, tooth formation
		- Sodium- maintenance of fluid balance
		- Iron- formation of hemoglobin
		- Zinc- normal growth development
		- Fluorine- strengthens bones and teeth
	+ **Water**
		- Most essential of all nutrients
		- Most abundant nutrient in the body (60% of body weight)
		- Essential for all chemical processes that occur in the body
		- Necessary for temperature control and elimination of wastes
		- Should drink about 2.5L (10 glasses) of water per day

**Nutrient Requirement and Recommendations:**

* The amount needed to prevent the nutrient’s deficiency disease according to Recommended Dietary Allowances (RDA)/ Recommended Dietary Intakes (RDI)
* Tolerable uptake levels (ULs)- help individual avoid harm from consuming too much of a nutrient
* Estimated Average Requirement (EAR)- average daily nutrient intake level estimated to meet requirement of half the healthy individuals in a particular age group
* Food Labels- Present information in the form of percentages of daily values based on a standard 2,000 calorie diet
* MyPlate
	+ Replaced the Food Pyramid in 2011
	+ Emphasizes the need for a more individualized approach to improving diet and lifestyle
	+ Shows traits of gradual improvement, physical activity, variety, moderation, and proportionality
	+ [Click Here](https://www.choosemyplate.gov/resources/MyPlatePlan) to go to USDA MyPlate website and create an individualized plan

**Dietary Supplements:**

* No scientific evidence that shows that exercise increases requirements for nutrients such as proteins, vitamins, and minerals (exercise increases the need for energy)
* Vitamin Supplements
	+ A megadose of vitamin C does not prevent you from getting sick. It causes diarrhea and a possibility of development of kidney stones.

**Mineral Supplements:**

* Calcium Supplements
	+ most abundant mineral in the body essential for bone and teeth formation, muscle contraction, and conduction of nerve impulses
	+ If calcium intake is too low, the body will remove calcium from the bones, over time they will become weaker and cause osteoporosis
	+ Adequate Intake is 1,000mg
		- 25% women consume less than 300mg a day
* Iron Supplements
	+ Iron deficiency is a common problem, especially in young females
	+ Deficiency can result in iron deficiency anemia
	+ Iron is needed to form hemoglobin, so a deficiency decreases the oxygen- carrying ability of the red blood cells so the muscles can’t obtain enough oxygen to generate energy
	+ Anemia leaves a person feeling tired and weak

**Protein Supplements:**

* Most athletes believe that more protein is needed to build bigger muscles
* To gain muscle, athletes should consume an extra 1-1.5g/kg a day (per body weight)

**Creatine Supplements:**

* Naturally occurring organic compound synthesized by the kidneys, liver, and pancreas
* Obtained from ingesting meat and fish
* Integral role in energy metabolism
* Phosphocreatine- stored in skeletal muscle and is used during anaerobic activity to produce ATP with the assistance of the enzyme creatine kinase
* Increases the re-synthesis of ATP (increasing ability to workout)
* Improves exercise recovery because it is a lactic acid buffer
* Creatine was banned by the NCAA in August of 2005 (Schools cannot supply it), but creatine itself is not banned.

**Herbal Supplements:**

* Thought to nourish the brain, glands, and hormones
* Works with the body’s function so that it can heal and regulate itself
	+ Ephedrine- Stimulant that has been used as an ingredient in diet pills, rec drugs, and OTC medications
		- Similar to amphetamine
		- Have caused heart attacks, stroke, tachycardia, depression, convulsions, etc.

**Eating and Drinking Practices:**

* Caffeine Consumption
	+ Central nervous system stimulant
	+ Can enhance the use of fat during endurance exercise, delaying the depletion of glycogen stores
	+ Makes calcium more available to muscles during contraction
* Alcohol Consumption
	+ Decreases physical coordination, slowed reaction times, and decreased mental alertness
	+ Increases the production of urine, resulting in body water loss

**Pre-Event Nutrition:**

• Purpose is to provide the competitor with sufficient nutrient energy and fluids for competition while taking into consideration the digestibility of the food

* Try to eat the largest amount of carbs
* Eat food that digests quickly
* Consume food 3-4 hours before competition or exercising
* Liquid food supplements as extremely effective preevent meals

**Glycogen Supercompensation**

* For endurance events, you want to maximize the amount of glucose that can be stored (so want to reduce the training program a few days before competition and increase carb intake)
* Recommendations for Restoring Muscle Glycogen after Exercise
▪When the rest period between exercise sessions is short (less than 8 hours), the athlete should eat carbs to restore glycogen.