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**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.