

Chapter 6- Nutrition

- Fuel potential
 - o Fat- 9 calories/ gram
 - o Carbohydrates and proteins- 4 calories/ gram
- Water
 - o Can only survive without water for a few days because we need it to digest, absorb, transport nutrients & regulate body temp, carry waste out of body, and lubricate moving parts
 - o Electrolytes- mineral components that carry electrical charges and conduct nerve impulses (maintain the fluid balance inside and outside of the cells) = sodium, potassium, and chloride
 - o Water needs vary according to foods you eat, temp and humidity in environment, activity level, etc.
 - o Adults usually need 1-1.5 milliliters of water for each calories used in a day (2000 calories= 8-12 cups needed)
- Protein- nutritional muscle
 - o Essential nutrient made of 20 amino acids, needed to build & maintain muscles, bones, & other tissues
 - Essential amino acids- ones your body can't produce on its own, must come from food
 - o Animal proteins (meat, fish, poultry, milk, cheese, eggs) are usually a good source of complete proteins – ample amounts of all essential amino acids
 - o Vegetable proteins (grains, legumes, nuts, seeds, vegetables) provide incomplete proteins – some but not all essential amino acids
 - o Mutual supplementation – eating two foods with complementary proteins (different essential amino acids) at one meal during the day
 - o AMDR for protein = 10-35% of daily calories, based on body weight → average adult needs .8 grams for every 2.2 pounds
- Carbohydrates- body's main source of energy; only source of energy for brain cells and red blood cells
 - o Are sugars and starches, come mostly from plants (except lactose)
 - o Most of the carbs and other nutrients we need come from grains, seeds, fruits and vegetables
 - o Simple carbohydrates- easily digestible, composed of 1 or 2 units of sugar; six are important for nutrition= glucose, fructose, galactose, lactose, maltose and sucrose
 - Glucose- main source of energy for brain and nervous system
 - Sugars are absorbed into blood and travel to body cells to be used for energy
 - Glucose also travels to liver and muscles where it is stored as glycogen for future energy
 - Large amounts of simple sugars cause burst of energy b/c they enter bloodstream quickly & leave you depleted b/c they are absorbed fast too
 - Sugar consumption linked to obesity and diabetes increase in US
 - o Complex carbohydrates- composed of multiple sugar units, inc. starches and fiber
 - Starches- found in grains, veggies, and fruit → most have ample vitamins, minerals, proteins and water; must be broken into simple sugars before being absorbed or stored for future use
 - Complex carbs are often refined to be easier to digest and more appealing → white rice, bread, flour, pasta, & sweet deserts have been stripped of nutritious components
 - whole grains- assoc. w/ lower risk of diabetes, obesity, heart disease, etc.
 - o RDA for carbs is 130 grams → AMDR for carbs is 45-65% of daily energy intake which amounts to 225-325 grams & most Americans diet is about 50% calories from carbs, but most are in form of simple sugars or refined grains
 - o Fiber-
 - Dietary fiber- complex carb found in plants that cannot be broken down in the digestive tract → passed through the intestines and expelled rapidly
 - Functional fiber- natural or synthetic fiber added to increase healthiness of food
 - Total fiber- combined amount of dietary and functional fiber in food

- Soluble fiber- dissolves in water, known to lower cholesterol, and can slow digestion to even out blood sugar levels
 - Insoluble fiber- absorbs water, helps you feel full & stimulates contractions in intestinal wall
 - Fiber best obtained through diet; excessive amounts can decrease absorption of other vitamins & minerals
- Fats- concentrated energy source and the principle form of stored energy in the body
 - o Provide essential fatty acids, play role in production of other fatty acids and vitamin D, and provide major material for cell membranes and myelin sheaths that surround nerve fibers
 - o Assist in the absorption of vitamins A,D, E & K
 - o Types of fats
 - Saturated- lipids that are predominant fat in animal products and stay solid at room temperature
 - Raise levels of cholesterol- waxy substance that can clog arteries and lead to cardiovascular disease- raise LDLs
 - Monounsaturated- lipids that are liquid at room temp but solidify somewhat when refrigerated
 - Polyunsaturated- liquid at room temp and when refrigerated (oils)
 - Mono & poly found mostly in plant sources
 - Lower LDLs and raise HDLs
 - Trans fats – lipids that have been chemically modified through hydrogenation so that they remain solid at room temp
 - Hydrogenation prolongs food's shelf life and changes texture
 - Raise LDLs and lower HDLs
- Vitamins- naturally occurring organic micronutrients that aid chemical reactions in the body and help maintain healthy body systems
 - o Serve as catalysts for releasing energy from carbs, proteins, and fats
 - o Aid in chemical reactions of body
 - o Help maintain components of immune, nervous, and skeletal systems
 - o Need 11 specific vitamins: A, C, D, E, K, thiamine (B1), riboflavin (B2), niacin, B6, folic acid, and B12
 - Biotin and pantothenic acid (B-complex vitamins) are also considered important
 - o Fat soluble- A, D, E, and K
 - Can be stored in the liver or body fat & can reach toxic levels if over consumed
 - o Water soluble- C, thiamine, riboflavin, niacin, B6, folic acid, B12
 - Excreted in urine, must be consumed more often than fat-soluble vitamins
 - B6 and C can build to toxic levels
 - o Sources
 - A- liver, dairy products, fish, dark green vegetables, yellow and orange fruits and vegetables
 - C- citrus fruits, strawberries, broccoli, tomatoes, green leafy vegetables, bell peppers
 - D- fortified milk and cereals, fish, eggs
 - E- plant oils, seeds, avocados, green leafy vegetables
 - K- dark green leafy vegetables, broccoli, cheese
 - Thiamine (B1)- enriched and whole grain cereals
 - Riboflavin (B2)- milk, mushrooms, spinach, liver, fortified cereals
 - B6- fortified cereal, meat, poultry, fish, bananas, potatoes, nuts
 - B12- fortified cereal, meat, poultry, fish, dairy
 - Niacin- meat, fish, poultry, peanuts, beans, enriched and whole grain cereal
 - Folate- dark green leafy vegetables, legumes, oranges, bananas, fortified cereals
- Minerals- naturally occurring inorganic micronutrients, such as magnesium, calcium and iron, that contribute to proper body functioning
 - o Needed by body in relatively small amounts for building strong bones and teeth, helping with metabolic process, and maintaining proper functioning of most processes
 - o 20 essential minerals needed

- Need 100+ milligrams of six macrominerals: calcium, chloride, magnesium, phosphorus, potassium, and sodium
 - Need less than 100 milligrams of microminerals – chromium, cobalt, copper, fluorine, iodine, iron, manganese, molybdenum, nickel, selenium, silicon, tin, vanadium, and zinc
- o Balanced diet provides all essential minerals → supplements not recommended for most people because they are insoluble and can build up in body and become toxic in excess amounts
- o Food sources
 - Calcium- dairy, canned fish, dark green leafy vegetables
 - Iron- meat, poultry, legumes, dark green leafy vegetables
 - Magnesium- wheat bran, green leafy vegetables, nuts, legumes, fish
 - Potassium- spinach, squash, bananas, milk, potatoes, oranges, legumes, tomatoes, green leafy vegetables
 - Sodium- table salt, soy sauce, processed foods
 - Zinc- fortified cereals, meat, poultry, dairy, legumes, nuts, seeds
- Phytochemicals- substances that are naturally produced by plants and may keep body cells healthy, slow down tissue degeneration, prevent the formation of carcinogens, reduce cholesterol levels, protect the heart, maintain hormone balance, and keep bones strong
 - o Antioxidants- substances in foods that neutralize the effects of free radicals (which are produced from metabolizing oxygen that is breathed in)
 - Found primarily in fruits and vegetables, especially bright colored ones and green t
 - Vitamins E & C and beta carotene are antioxidants
 - o Phytoestrogens- plant hormones similar to human estrogen, but less potent
 - May lower cholesterol and reduce risk of heart disease
 - Found in 300+ plants, including brussels sprouts, broccoli, and cauliflower, rye, wheat, sesame seed, flaxseed, and soy
 - o Phytonutrients- substances extracted from vegetables and other plant foods and used in supplements
 - Lycopene – found in tomatoes, may inhibit reproduction of cancer cells
 - Bioflavonoids- may benefit cardiovascular system

Chapter 7 - Fitness

- Physical activity- activity that requires any type of movement, important part of good health
- Exercise- structured, planned physical activity, often carried out to improve fitness
- Physical fitness- the ability of the body to respond to the physical demands placed on it
- Skill related fitness- ability to perform specific skills associated with various leisure activities or sports
 - o Agility, speed, power, balance, coordination, and reaction time
- Health related fitness- ability to perform daily living activities (like shopping for groceries) and other activities with vigor
 - o Cardiorespiratory fitness- the ability of the heart and lungs to efficiently deliver oxygen and nutrients to the body's muscles and cells via the bloodstream
 - Training
 - Need to alter duration and intensity about every 2 weeks because the body adapts to the cardiovascular workload while trying to increase cardiovascular fitness
 - Program development
 - Frequency- at least 2X/ week; ideal is 3X/week
 - Intensity- work in the target heart rate zone (about 55-90% of max heart rate) for optimal benefit
 - Time- 15-60 minutes; 30 minutes is a good average to aim for
 - Type of activity- two types of aerobic exercise: (1) exercises that require sustained intensity with little variability in heart rate response, like running and rowing, and (2) exercises that involve stop and go, like basketball or tennis