

Health and nutrition



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On average 62 high quality years of living on average 6 categories of essential nutrients: carbs, fats, proteins (microinstructions), vitamins, minerals (microinstructions) and water. Microinstructions: body requires in relatively large amounts to supply normal functions and health. Carbs most available energy primary fuel source for our bodies, particularly for the brain and physical exercise. (4 kcal/gram) Ex) fiber rich foods, grains, fruits, veggies, seeds, dairy. Fats- reserve energy. Important energy source for our body at rest and during low intensity activities. (9 kcal/gram) Ex) solid fats (butter and margarine) and liquid fats (oils). Protein- emergency energy used to build tissue and regulate body function.

Ex) meats, nuts, legumes, dairy, seeds. Microinstructions: nutrients needed in relatively small amounts to support normal health and body functions.

Vitamins and minerals. Water: vital for survival. Consume in pure form and in juices, soups, solid foods, other liquids, fruits, and veggies. Adequate intake ensures proper balance of fluid inside/outside cells and assist functions.

Healthful Diets. Proper combination of energy and nutrients. Adequate, moderate, balanced, and varied diets.

Adequate- provide enough energy, nutrients, and fiber to maintain a person's health. Moderation- eat right amounts of food to maintain a healthy weight. ND to optimize our body functioning. Balanced- combos of food that provide proper proportions of nutrients. Varied- eat different foods each day optimizing chances for consuming necessities, avoid boredom. Dietary Reference Intakes. List of dietary standards for healthy people. Identifies amount of nutrients you need to prevent deficiencies and chronic diseases.

Estimated Average Requirements (EAR)- average daily intakes level for half of healthy individuals particular to gender/age.

Recommended Dietary Allowances (RD)- daily nutrient intake meets 97-98% for healthy people, particularly age/gender Found by using the EAR.

Adequate Intake (AI)- recommended intake observed/experimentally determined estimates nutrients intakes. Calcium, fluoride, Vitamin D etc. Not enough research to determine exact amount just know your body needs it.

Tolerable Upper Intake Level (UL)- highest intake level to pose no risk in a particular life stage and gender.

Estimated Energy Requirement (EER)- average dietary intake produced to maintain energy balance. This considers a person's physical activity.

Acceptable Macronutrient Distribution Range (AMDR)- Range of intakes for particular energy source associated with reduced chronic disease risk. AMDR 5-65%-carbs 20-35%-fats 10-35%-proteins Average American Diet Food sold in the US- carbs- 45-50% Fats- 35-40% Protein- 15-20% Carbs- too few total carbs; too little starches; too much sugar; too little fiber.

Fats-too much fats; too much “ bad” fats so not enough “ good” fats

Proteins- eat too much protein and from “ wrong sources” Mediterranean Diet Lots of carbs, but they're “ good” ones like veggies, grains, fruits Protein in fish not steaks Fats in oils, unsaturated Lowers cardiovascular disease.

Promotes activity Differs from US by eating legumes, nuts, fish, eggs, cheese+yogurt over milk Energy from fats are from plants Dietary

Guidelines- US Department of Agriculture and Department of Health and Human Services in charge of creating guidelines to maintain a healthy diet.

Balance calories stay within ERE.

Increase physical activity Choose nutrient dense foods more nutrients less calories Consume healthful foods- more veggie and fruits @ least h grams of whole grains fat free/low fat milk Follow healthy eating patterns Wash hands and food Separate raw and cooked foods Cook foods/chill perishables Serving Sizes Ounce equivalent- define serving equal to 1 ounce to grain/protein Serving size on the food labels may not associate with USDA. This will lead to bad eating habits and obesity. Ex.

Super sizing Hunger- physiological drive for food whenever the body senses we need to eat. Variety of foods suffice.

Insulin and clangor responsible for blood glucose levels. Blood glucose levels go down after not eating changing levels and hypothalamus prompts hunger. Proteins have highest satiety (fullness) value. Stomach gets stretched, sends signals to stop eating to hypothalamus Appetite- psychological desire to consume specific foods Aroused by environmental cues triggering good memories Brain produces hunger sensation by the hypothalamus.

Different sources effect the hypothalamus nerve cells hormones amount/type of food we eat nerve cells lining stomach and intestines detect pressure changes to see whether hungry' or full.

Hormones produced to target organs in other parts of the body; some stimulate food intake others stimulate fullness One Of your 5 senses because stimulated by food to trigger appetite. Social and cultural events could stimulate. Social events give permission to eat unhealthily, cake at a

birthday party. Location, traveling, and emotions can all trigger Digestion- breaks down food to small molecules able to travel throughout DOD and cross into cell to build larger structures. Chemically and mechanically.

Absorption- takes products of digestion through intestinal wall. Removed from the GIG tract into the body. Elimination- undigested food gets excreted; chat it out. Nutrient molecules fuel cells and the body to perform actions Organ Systems perform integrated functions GIG Tract Begins at the mouth and ends at the booty hole. 30 feet long.

Nutrient transport Mouth Mechanical Bite and chewing breaks down foods Chemical Salivary gland excretes salivary amylase enzymes that assists body digestion Esophagi Epiglottis closes off wind pipe when you swallow

Runs from the back of the mouth to the stomach Peristalsis- waves of squeezing/pushing/moving food down. Happens in the throat and intestines. Only mechanical digestion Stomach J shaped organ where food partially digested. Can be stored for up to 2 hours.

Mechanical digestion churning around in the stomach Gastric juice- acidic liquid secreted by stomach to separate foods. When food leaves stomach its chem. (semisolid containing water, gastric juice, and partially digested food. Small Intestine Most digestion and absorption occur here Food broken down into molecules that body can absorb. Arts of the small intestine Duodenum- connects pyloric sphincter to stomach. (top) Jejunum-middle of small intestine Ileum- connects large intestine at illogical valve Accessory Organs Assist digestion but not part of the Gig tract.

Gall Bladder- sac tissue under liver secretes bile into small intestine. Liver fluid stored in the gall bladder. Emulsifies fats in small intestine. Pancreas (gland) behind stomach. Secretes digestive enzymes. Absorbs water throughout GIG tracts.

Villa- located in the small intestine that trap nutrients and absorb them into capillaries.

Absorbs vitamins as well, which aren't broken down. 2 main fluids that transport nutrients and waste products throughout the body blood- travels through the GI tract picks up nutrients absorbed through the villi of the small intestine and carries them to the liver for processing. Takes waste products to your kidneys lymphatic vessels- pick up fats and fat soluble vitamins. Transport to lymph.

Eventually enter blood stream Liver- largest organ of the GI tract. One of the most important organs of the body.

Main functions- production of bile and processing of nutrient- rich blood from the small intestine Largest digestive organ and performs 500 functions function- receive the products of digestion and then release into the bloodstream needed nutrients processes, stores and regulates blood levels Alcohols- liver filters toxins from blood, 1 drink per hour, exceeds rate, liver becomes overwhelmed and cells are damaged. Chronic alcohol abuse causes lasting issues. The Large Intestine Thick, tube like structure that frames from the small intestine. Consists of cecum, colon, rectum and anal canal.

Mostly water and chemicals removed and sit formed. “ elimination”

Disorders Gastrointestinal reflux- hydrochloric acid from stomach will seep into the esophagi and burn it. More than twice per week. Caused by smoking pregnancy, alcohol use, overweight and lying down too soon after meals.

Peptic ulcer- area Of the gig tract that’s been eroded away by gastric juice in tummy.

Usually in stomach. Caused by non-steroidal anti-inflammatory drug and pylori infection. Specific food disorders Food intolerance- gig symptoms occur after consumption of specific food but isn’t a immune response.

Food allergy- true inflammatory reaction caused by an immune response to a hypersensitivity to a protein component in the food. Limited-to-body wide inflammation. 150 die a year due to food allergy.

GIG attach to mast cells making these cells excrete histamines Celiac Disease- genetic disorder inability to absorb gluten. Causes an inflammatory immune response that damages the lining of the small intestine. Gluten IS found in wheat, rye, barley but corn is gluten free. Irritable bowel syndrome- colon functions interfered with. Causes cramps, bloating, and constipation or the opposite. : 6 Americans.

Moves too quickly through system, fluid isn’t absorbed. Or it moves too slow and too much fluid is absorbed. TREATMENT- stress management, physical activity, dietary strategies I. E.

) smaller meals and increased fluids and fiber. Probiotics- live microorganisms found in ‘ Yogurts” Increase number and activity of immune

cells, prevents diarrhea BIBS and improves lactose intolerance symptoms, reduces risk of allergies and prevents urinary tract infections. Chapter 3: Crabs Crabs- Made of carbon, hydrogen and oxygen; derived from plants; provide energy. Kilo calories per gram. Main source of fuel for brain and red blood cells.

Crabs provide almost 100% of the energy for maximal effort. Sugars and sweeteners- simple crabs Macroeconomics-only one sugar molecule or such as glucose; aka sugar. Glucose- most abundant and preferred by brain. Calaboose- doesn't occur alone; joins with glucose to form lactose.

Fructose- sweetest natural sugar found in fruits and veggie. Disaccharide- two sugar molecules ex.) lactose-milk sugar; maltose- molecules in food to form starch molecules; and sucrose- sugarcane, sugar beets and honey.

Starch/Fibers/ Glycogen- complex crabs polysaccharides- Long chains of glucose molecules.

Glycogen- Animals store crabs as glycogen in liver and muscles. Breaks down into glucose. Not found in food. Starch- plants store glucose in the form of starch. Ex.

) grains (wheat rice corn SST), potatoes, legumes(peas beans and entitles). Our body breaks down starches into glucose. Alpha bonds in starch between glucose molecules easily broken down. Beta bonds in cellulose can't be broken down on body, indigestible. Fiber- non digestible parts of plants, leaves, stems and seeds.

Tight knit bonds.

Virtually no energy contributed. 25 grams/day for women and 38 grams/day for men. 14 grams for every 1 000 calories. Whole grains, veggie, fruits, nuts, and legumes. Make sure too drink lots of water when increasing consumption to avoid constipation. Fiber consumption reduces risk of gastrointestinal(makes it function better) and earth disease, controls glucose and cholesterol levels, improves weight control, and reduces obesity/type 2 diabetes risk.

Helps reduce risk Of chronic disease and maintains healthy GIG tract.

Dietary fiber- naturally occurring, fruits, veggie, whole grains Functional fiber- supplements, manufactured (out of a box), cellulose, Soluble fiber- dissolves in water, forms a gel when wet (viscous), easily digested by bacteria in colon, found in citrus fruits, berries, oats, and reduces cardiovascular disease. Insoluble fiber- doesn't dissolve in water, not digested, whole grains and veggie, promotes regular bowel movement.

Health benefits of high fiber diet Helps maintain bowel health because it isn't easily broken down so it creates bulk which aids in moving stool and harmful carcinogens.

Helps hemorrhoids divestitures disease and colon cancer.

Lowers cholesterol levels: Reduces low density of lepidopterist or “ bad” cholesterol levels. Helps control blood sugar level: soluble fiber can slow absorption of sugar and help improve blood sugar level. Aids in achieving healthy body weight: high fiber foods requires more chewing time which gives your body time to register when you're no longer hungry. Tends to make a meal feel larger and linger longer so you stay lull longer.

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Fewer calories for the same volume of food, less “ energy dense” Shopping for fiber: whole grains, fresh fruit and veggies, check labels of frozen fruits and veggie, be careful of sodium and sugar content in canned fruits and veggies, and lastly legumes. Glycogen-storage form of glucose for animals. Stored in our muscles and liver and we can break it down very quickly for energy. Not a dietary source of carbs. Complex Carb consumption way too low to maintain healthy levels while simple sugars way too high. Carb Digestion: Most chemical digestion of carbs occur in small intestine.

Not much in the stomach. Pancreatic amylase- produced by pancreas, secreted into small intestine and breaks down carbs into maltose. All carbohydrates are converted into glucose in the liver. Glucose in the blood is our primary energy source. Excess glucose converted into glycogen by the liver.

The Liver- it can store 70 grams of glycogen while muscles can store 1 20 grams of glycogen. Between meals the body draws from the livers glycogen to maintain blood glucose levels and support needs of cells including brain, spinal cords, and red blood cells. Glycogen in muscles provide energy to muscles.

Endurance athletes can't increase their storage of muscle glycogen from 2-4 times. Insulin- hormone secreted into the blood stream by beta cells in the pancreas when lots of glucose in blood stream. Insulin increases movement of proteins from inside the cell to the cell membrane which allows glucose to enter the cell assisting in the maintenance of blood glucose levels.

Also Stimulates liver to take up glucose and store as glycogen. Glucagon- Hormone secreted by the pancreas in response to decreased blood level of glucose. Act oppositely on insulin. Secreted when you haven't eaten in a smooth minute.

Causes the liver to convert stored glycogen in the liver in to glucose which is secreted into the bloodstream and transported to cell for energy. Also assists in the breakdown of body proteins so the liver can stimulate gluconeogenesis.

Gluconeogenesis- if the diet doesn't have enough carbs/glucose then the body will make glucose from proteins. This process involves breaking down the proteins in the blood and tissue and converting the components to glucose. Using proteins for energy reduces the level of protein available to make new cells, repair tissue or performing other functions.

Lack of carbs over a period of time and deriving proteins from the body as energy will breakdown tissues from heart, liver, kidneys and muscles.

Glucose pathways immediately used. 60-90% stored in liver and muscles. A majority is stored but it depends on diet and previous activity. 0-30% Converted and stored as fat only excess will be stored as fat. Depends on total, type, and time carbs eaten.

IEEE) simple carbs and empty tummy. Either used for energy or changed into fat (fatty acid) and stored. Fat will stay as fat and can't be converted back to glucose.

Hypoglycemia- a condition marked by blood glucose levels being lower than normal fasting levels.

Caused by excess production of insulin which lowers blood glucose too far
Symptoms- about 3 hours after meal. Nervousness, shakiness, anxiety, sweating, irritability, weakness etc. True hypoglycemia is rare and happens if someone injects too much insulin, pancreatic tumor, liver infection
Glycerin Index-measurement of the potential of foods to raise blood glucose and insulin levels. Food w/ high glycerin index cause sudden spike in blood glucose and triggers a surge in insulin.

Ex) potatoes white rice Low glycerin index cause low to moderate fluctuations in blood glucose.

EX) Fruits veggies peas. Medium- carrots corn Glycerin load- amount of carbs times glycerin index more detailed info about food better indication of foods effect on glucose response because it factors in both carbs and index. Apple- 5.7 glycerin load. (carbs)/1 DO Low glycerin load food- Low to moderate changes in blood glucose better for diabetics higher in fiber reduce heart disease and colon cancer RD and AMOUR for carbs RD of carbs is based on the amount of glucose the brain needs Current RD for adults 19+ is 130 grams per day.

This doesn't cover the amount of carbs above brain activity.

Ex) exercise and sit. AMID for carbs is 45-65% of total energy intake. Most carbs eaten should be fiber rich and unprocessed. Like whole grains, fruits and veggies. Refined Carbs- simple sugars Added sugar- sugars and syrups that are added to food during processing or preparation.

High fructose corn syrup Nutritive sweeteners- sweeteners such as sucrose, fructose, honey and brown sugar that contribute empty calories. Non-nutritive sweeteners- manufactured sweeteners that provide little to no energy. Alternative sweeteners) Safe for adults children and people with diabetes within FDA guidelines Doesn't prevent weight gain. Saccharin- used in foods and drinks (sweetener's) Stevia- 175 sweeter than sugar.

Gums, candies gelatins Sucrose- 600 times sweeter used for cooking (spelled) Aspartame-most popular. 200 times sweeter than sucrose. Most common source of added sugars in the US is in sodas and soft drinks. One 12 oz. can of diet cola contains 38.5 grams of sugar almost 10 teaspoons.

16,420 grams of sugar or 267 cups of sugar per year.

Diets high in simple sugars: Cause dental issues Increase bad cholesterol Increases likeliness of disease Diabetes- serious chronic disease in which the body can no longer regulate glucose within normal limits and the blood glucose levels become ungenerously high or fall dangerously low. Effects include: Blindness, seizures, kidney failure, nerve disease, 18 million in US diagnosed with diabetes, estimated 5.7 million have it but aren't diagnosed some women develop gestational diabetes during pregnancy. Two main forms, type 1 and type 2. Type two more common among minorities excluding Asians, and amongst older adults.

Type 1: form Of diabetes in which body can't produce enough insulin. Cause unknown. Born with it and usually diagnosed around 10-14. Only treatment is insulin injections Type 2: the form in which body cells progressively

become less responsive/ assistant to insulin or the body doesn't produce enough insulin.

Obesity is often the trigger of type 2 diabetes Risk Factors- A waist circumference greater than 35 inches for women and 40 for men Elevated blood pressure Unhealthful levels of certain blood lipids Abnormally high blood glucose levels. Most cases develop after 45. 23% of Americans over 60 have type 2 diabetes.

Increase in type 2 among children and young teens posing serious health consequences. More than 6% of college students have pre-diabetes and every year 3, 700 Americans under 20 get diagnosed Treatments- Lose weight Eat healthy Exercise regularly Medications-improve sensitivity of cells Daily insulin injections Decrease risk of type 2- Daily exercise and eat healthier Fats: essential energy supplying nutrients. Fats are a group of substances called lipids.

They are insoluble, they don't dissolve in water. Classified as fats and oils. 3 different types of lipids. Triglyceride 95% of the fats we eat are triglycerides.

Consisting of 3 fatty acids attached to a 3 carbon glycerol backbone Fatty acid- long chain of carbon atoms bound to each other as well as to hydrogen contain an acid group at the end Glycerol- a sugar Fatty acids can differ in length of chain; short medium or longer.

Also differ in amount of saturation; how many hydrogen's atoms surround each carbon Differ in shape. Saturate or unsaturated fats. Saturated- contain Max amount of hydrogen. Each carbon bonded to two hydrogen don't have a

kink in them Long chain of carbon atoms bonded to other carbon atoms and to hydrogen atoms.

A fatty acid w/o double carbon bonds and saturated with hydrogen.

Butter, red meat, lard, cream, whole milk, cheeses coconut oils and palm oils. Solid at room temperature. Because they stack up tightly packed due to not having kinks. Diets high in saturated fats increase risk for heart disease. Saturated and trans fats are most associated with increased risk of heart disease Recommended intake for saturated fat 7-10% of total energy; average American intake is 11-12% unsaturated fatty acid- at least 1 double carbon bond creating a kink.

Liquid at room temperature. Because they're kinky and don't stack well Monounsaturated fats- lack hydrogen in 1 region.

Contain one double carbon bond. Olive oil and canola oil. Polyunsaturated fatty acid- lacks more than 1 hydrogen.

More than 1 double carbon bond. Corn, canola and safflower oils.

Hydrogenation- the addition of hydrogen atoms to unsaturated fatty acids to aka solid- refers to the number of hydrogen atoms Converts liquid fats into a more solid form used to create margarine from Oils This often creates a trans fatty acid. Be wary.

Try not to consume trans fats. Developed through hydrogenation Straightens out the chain of an unsaturated fat making it more solid and preserving it longer.

More detrimental to our health than saturated fats because they change the cell functioning and makes it more difficult to remove cholesterol from the blood. FDA allows any product with less than 1 gram of trans fat to claim 0 grams of trans fat. Partially hydrogenated oils-trans fats. Essential Fatty acids- Essential nutrients- Body requires it to function Body cannot make it So it must be consumed in the diet Fatty acids have to be consumed in the diet because our body can't produce them Building blocks to other elements that the body needs (precursors) Linoleum acid- omega 6 fatty acid.

Found in veggies or nut oils Alpha-linoleum acid- omega 3 fatty acids. Found in green veggies, fish oil, fish products, other oils. Makes 2 important fatty acids: EPA and DHA that protect against heart disease by improving function of blood vessels, clotting, blood pressure, irregularities. Butter vs.. Margarine Butter: 65% saturated fats 1 tabs= 30 grams of cholesterol Margarine: filled with trans fats that increase risk of heart disease, weaken immune system function, harm cell membranes.

Many trans fats contain toxic metals like aluminum and nickel.

Solution to butter vs.. Margarine: try nut butters instead of butter like peanut butter, cashew butter, almond butter, etc. However, they are high in calories but are rich in essential fatty acids and other heart healthy unsaturated fats.

Phosphoric Type of lipid in which a fatty acid is combined with another compound that contains phosphate. Soluble in water Assist in transporting fats in our bloodstream Present in peanuts, egg yolks, and some processed foods. They aren't essential fats, our body can produce.

Phosphate backbone with lipid tails Stereos Type of lipid found in foods and body with a ring structure. Found in plants and animal foods Fatty parts of animals: butter, egg yolk, whole milk, meats and poultry.

Cholesterol is the most common stereo that occurs in diets and our body Has a bad rep because often associated with saturated fatty acids which can increase blood and cholesterol levels and increased risk of heart disease. Body does require cholesterol for neural cells (brain, spinal cord, etc), synthesis of hormones, bile and vitamin D Essential to human health.