Useful and harmful nutrients and non-nutrients in some common foods
By Faraz Shahbazian, Ph.D.

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“There are more than 20,000 different phytonutrients in fruits and vegetables, and each has a unique role in fighting age-related damage in our bodies.” (From AARP The Magazine)

**Fiber:** Fiber or roughage is a type of plant-derived carbohydrates that body cannot digest. It passes through the body undigested.

Fiber comes in two varieties, both beneficial to health. **Soluble fiber**, which can dissolve in water, contains pectin (a soluble gelatinous polysaccharide present in many fruits, used to thicken preserves), gums (an adhesive substance), mucilage (a thick gluey polysaccharide from plant), and some hemicellulose (similar to cellulose but more random). The following food contain soluble fiber: Oatmeal, nuts, beans, and apples. Soluble fiber has the following benefits: lowering glucose levels and cholesterol. **Insoluble fiber** (insoluble in water) contains cellulose (a polymer of glucose), lignin (a class of complex organic polymers that makes up cell walls and wood), and some hemicellulose. The following foods contain insoluble fiber: Whole wheat, whole grain couscous, brown rice, legumes, carrots, cucumber, and tomatoes. Insoluble fiber has the following benefits: Help food move through one’s digestive system, and help preventing constipation. This is why children and adults need at least 20 to 30 grams of fiber everyday for good health, but most people get much less fiber.

**Milk:** Milk is a nutritious liquid formed from mammary glands of mammals. It is rich in calcium, a mineral essential for healthy bones and teeth. Cow’s milk is fortified with vitamin D, needed for bone health, and prevents osteoporosis, gives you smoother skin, stronger immune system, lowers the chance of respiratory problems and cancer. Milk also contains Vitamins A, B12, riboflavin, phosphorus, selenium, magnesium, and zinc. It also contains carbohydrates and proteins. The major carb in milk is lactose (milk sugar), a disaccharide made up of two monosaccharides, glucose and galactose. Lactose causes lactose intolerance in some people. At early stage of life, we have a lot of the enzyme, lactase, for digesting lactose so that it can be absorbed. However, after a few years, most of us do not make the enzyme, lactase, and we actually do not need it, due to not drinking too much milk and milk products so we become
lactose intolerant. This causes diarrhea, gas, and dehydration, when we consume milk and milk products. For these people, there is lactose-free milk available.

Milk is available as whole milk (3.25% fat), reduced-fat milk (2% fat), low-fat milk (1% fat), and skim milk (no fat). 70% of milk fats are saturated but they are not bad for health.

Milk is also a rich source of proteins. The major proteins in milk are either casein, a fibrous protein, insoluble in water (80% of proteins in milk), or globular whey proteins (20%). Casein increases the absorption of minerals such as calcium and phosphorus and promotes lower blood pressure. Whey proteins cause a decrease in blood pressure, improve mood during stress, and good for maintaining muscle. Milk allergies are rare but more frequent in young children. Most allergies are due to lactoglobulins (another protein in milk), and casein. Its symptoms are: skin rash, swelling, breathing problems, vomiting, diarrhea, and blood in stool. Also, it is associated with acne (pimples on face, chest and back).

Milk is usually pasteurized. Pasteurization destroys potentially harmful bacteria which is found in raw milk. Pasteurization involves slowly heating the milk at 145 degrees of Fahrenheit for 30 minutes, cooling it, and refrigerating it. Milk is also usually homogenized. Homogenization break fat globules into smaller units (in raw milk the globules stick together and float on the surface). Homogenization is done by heating the milk and pumping it through narrow pipes at high pressure. The pasteurization and homogenization increase the shelf life of milk and give it whiter color.

**Milk products (dairy)** are: Butter, Cheese, cultured dairy (yogurt), cottage cheese, sour cream, dips, ice cream, custard, milk shakes, half and half, whey, milk powder, clotted cream (thick cream made by indirectly heating full-cream cow’s milk using steam and water bath and then leaving it in a shallow pan to cool dry), filled milk (any milk or cream that has been reconstituted with fats or vegetable oil, from sources other than dairy), and junket (milk-based desert made from sweetened milk and rennet, which causes curdling).

**Cheese:** There are thousand variety of cheeses in a wild range of flavors and textures, formed by coagulation of milk proteins, casein from milk of cows, buffalo, goats, and sheep, to get consolidated curd of milk solids in which milk fat is entrapped by coagulated casein.

How cheeses are made: Start with fresh warm milk. Acidify the milk with vinegar and /or citric acid. Add and mix a coagulant, rennet, and lactic acid bacteria (or other kinds of bacteria, such as propionic acid bacteria for Swiss cheese), until a gel is formed. Test the firmness. It takes time for rennet to solidify it. Cut the curd. Stir, cook, and wash the curd. Drain the curd. Salt and age the cheese.


Cheese and fermented dairy give you good gut microbiota which produces healthy gut bacteria. In these dairies there is glutathione, an antioxidant, good for brain health, and calcium to reduce blood pressure.

One risk of dairy is the saturated fat in these products, which increases the risk of diabetes, obesity, and cardiovascular problems. Estrogen and steroid hormones cause disruption of endocrine system, sinus congestion, skin rashes, acne, migraine headaches, and increase of risks of cancer. Sensitivity to casein trigger inflammation throughout the body.

**Yogurt:** Yogurt, that is fermented milk with lactic acid bacteria, and other fermented foods contain a probiotic, the beneficial bacteria, which strengthen the immune system, and cover inner linings of intestines. This is one of the best ways to be healthy, both physically and mentally, having good bacteria on the intestines.

**Soy milk:** Soy (and other plant-based milks) are produced by soaking and grinding soy beans (or other material), boiling the mixture, filtering out the particulates, forming stable emulsion of oils, water, and proteins. The same procedure is used for making tofu and kefir.

There are many plant-based non-dairy products. They include: Almond milk, Oat milk, Rice milk, Potato milk, Hemp milk, and Soymilk. These drinks contain low amount of saturated fat, and no cholesterol. They also contain plant-based proteins. However, they have less calcium than cow milk. They lower LDL (bad cholesterol) in the body. They reduce cholesterol level, help lose weight, strengthen blood vessels, and lower chance of prostate cancer.

While dairy milk can increase uric acid excretion and help people with gout, soy milk does the opposite. It causes deposits of uric acid in the joints. Gout is due to excessive uric acid (uric acid is formed from metabolism of purine bases, existing in DNA and RNA. It has low solubility in water and precipitate in joints, causing pain). Soy will not cause lactose intolerance because it does not contain lactose.

Soy and other plant-based non-dairy milks may contain herbicides. The herbicides, residual from the agriculture of plants, are toxic and disrupt endocrine signaling system by increasing certain kinks of cancer and non-Hodgkin lymphoma, chronic kidney disease, DNA damage, and disrupt intestinal flora.

Soy also contains a class of carbohydrate-binding proteins (agglutinins), called lectins, macromolecules that are highly specific for sugar moieties. They perform recognition at cellular and molecular levels and play important role in biological recognition phenomena involving carbohydrates and proteins. Lectins reduce the body’s ability to absorb nutrients, which would be what these non-dairy milks do.

**Fermented foods:** Not all bacteria are pathogenic (disease causing). Some bacteria are good for health such as the ones in your gut. People use probiotics (pills or food with good bacteria) to become healthier. Instead of probiotics, one can have fermented foods.

Fermentation is an ancient form of cooking but instead of flame, one uses good bacterium such as lactobacteria to cause “so called, cooking the food”. They break down the food and turn it sour or acidic. Sourdough bread, sauerkraut, cheese, yogurt, beer, coffee, and chocolate are fermented foods. Eating any of them puts good bacteria in your system. Anything which destroys the good Bactria, such as long-term antibiotics or having artificial sweeteners, can destroy good bacteria and cause physical and mental illness.
**Pomegranate:** This fruit contains much antioxidants, 3 times more than red wine, and vitamin C, which help removal of free radicals, and protect cells from damage, and reduce inflammation.

**Apples:** Apples contain 2 kinds of cancer-inhibiting compounds: Flavonoids and phenolic acids. They protect against malignancies and stop cancer cells from dividing any further. That is why it is said: An apple a day, keeps the doctor away.

Different types of apples are: Red delicious, Fuji, Golden delicious, Granny smith, Empire, Honey crisp, McIntosh red, Gala, Cortland, Braeburn, Jonagold, Cameo, McConn apple, Musto, Jazz, Ginger gold, Baldwin, Cripps pink, Northern spy, Ambrosia, Zester apple, Liberty, Jonathan, Graven stein, SweeTango, Rome apples, Cox’s orange pippin, Paula red, Arkansas blanch, Opal, Indared, Winesap, Aker, Melrose, Cosmic crisp, Kanzi, Enterprise, Grimes golden, Newtown pippin, Sweeties, Lodi, Ingrid Marie, Lady Alice, James Grieve, Jupiter, Elstar, Esopus Spitzenburg, and Golden spire, Empire apple.

**Aloe Vera:** Used by Egyptians as universal panacea, was called the plant of immortality, and also used by Greeks for 2000 years. Today, it is used as beauty, medicinal, and skin-care products. It contains many vitamins, A (beta carotene), C, E, Folic acid, and choline. Also, it contains antioxidants that help to fight free radicals. It contains 8 enzymes, some of which reduce inflammation when used topically, and others help breakdown of sugars and fats. The plant contains several minerals, such as calcium, chromium, copper, selenium, and many others that act as antioxidants. It contains the phenolic compound, anthraquinone, which acts as laxative. Also, it contains emodin, which has analgesic antibacterial, and antiviral effects. It also has mucopolysaccharides which moisturizes skin and has anti-aging properties.

**Sea weed:** Sea weed contains sodium oligomannate (GV-971), which alter microbiota profile of the intestines in such a way that decreases microbiota-driven neuroinflammation. This chemical improves health in such a way that reduces prion inflammation, which is a characteristic of Alzheimer disease.

**Plums and prunes:** The plums are juicy and sweet – tasting with variety of colors. They are relative of peach, nectarine, and almonds. They are considered “drupes”, fruits that have a hard- stone pit, surrounding their seeds. Prunes are dried plums. They are highly nutritious. They contain Vitamins C and K, minerals potassium and copper, and lots of fiber. They also contain significant amounts of phytonutrients neochlorogenic and chlorogenic acids that act as antioxidants, neutralizing a particularly dangerous oxygen-radical, called superoxide anion radical, helping to prevent oxygen – based damage to fats. They also prevent constipation, providing bulk, and decreasing the transmit time for fecal matter. Also, propionic acid in these fruits is responsible in cholesterol lowering properties of these fruits. The different kinds of plums are Japanese plums: black plums, black ruby, Friar, black beauty, “Owen T” and “John W”, red plums, yellow plums, European and Italian plums: Moyer plums,
Greengage plums, Mirabelle plums, and plumcots, pluots, apriplums, apriums, plumcots, which are hybrids of different plums.

**Beans and lentils**: Loaded with fiber, beans and lentils contain fiber, proteins, vitamins, antioxidants, and phytochemicals, which protect colon cells and promote brain health. Soybeans contain genistein, useful for some kinds of cancers. Different kinds of beans are chickpeas, lentils, peas, kidney beans, black beans, soy beans, pinto beans, and peanuts. Different kinds of lentils (edible legumes) are brown lentils, green lentils, yellow lentils, black or Beluga lentils.

**Turmeric**: Curry contains turmeric, which contains curcumin, the yellow ingredient, fight against cancerous cells, and also it is anti-inflammatory.

**Tomatoes, watermelons, grapefruits, guavas, papayas, and goji berries**: The red ingredient is lycopene, which is an antioxidant stopping and destroying malignant cells. Different kinds of tomatoes: Cherry, Better Boy, San Marzano, Cherokee Purple, Early Girl, Black Krim, Kumato, Roma, Tigerella, Mortgage Lifter, Green Zebra, Super sweet 100, Mr. Stripy, Celebrity, Brandy wine, Raf, Gardner’s delight, Campari, Big Beef, Moneymaker, Big Rainbow, Hillbilly, Jubilee, Japanese Black Trifle, Santorini.

**Black-Eyed peas, pinto beans, peanuts, roasted pumpkin seeds, and wheat germ**: These nutritious legumes, are rich in zinc, a trace mineral that keeps your immune system in order.

**Carrots, dark green vegetables, sweet potatoes, pumpkin and winter squash**: They are rich in beta carotene, which an antioxidant, and ward off respiratory infections.

**Red, yellow, and orange produce**: Either fruits or vegetables, such as apricots, cantaloupes, carrots, squash, sweet potatoes, red peppers, or tomatoes contain antioxidants and carotenoids which support immunity, and decrease risk of cancer and cardiovascular disease. They also have beta-carotene, which decreases risk of age-related eye disease.

**Green vegetables**: The color of green in plants is due to existence of chlorophyll, a green pigment. It can be used as health supplement to improve health, boost energy, and fight illness.

**Coffee, tea, and cocoa**: These are beverages that people enjoy, all have a group of chemicals called xanthenes, which are caffeine, theophylline, and theobromine. They are all stimulants, vasodilator, bronchodilator (for treatment of asthma), heart stimulant, and diuretic. When ripe (color of bright deep red), coffee beans (called cherries) of certain coffee species are picked, processed and dried (spread them under the sun), and then roasted and ground. Coffee contains all the xanthenes, specially caffeine. **Cocoa or chocolate**: The ripe cocoa pods are removed, cut open with machetes (a utility tool with sharp edges like knife), and the white pulp is scooped out, fermented in wooden containers for 5 days to bring out the chocolate flavor, dried under the sun, roasted, cracked, winnowed (blow a current of air to remove the chaff or husks), ground, tempered (process of
altering chocolate fat composition so that it hardens at room temperature), molded, and wrapped.
Chocolate contains xanthenes, especially theobromine.

**Black, oolong, green, and white tea:** The leaves of the plant camelia sprout are dried and oxidized (exposed to oxygen) and then sometimes fermented with some kind of bacteria. White tea is not oxidized at all, green tea is slightly oxidized, oolong tea is somewhat oxidized, and black tea is completely oxidized. They contain xanthenes too. All kinds of tea contain quercetin, a powerful antioxidant, and L-theanine, a useful amino acid.
All of the above drinks have compounds which act as antioxidant (deactivate oxidants) such as chlorogenic acids, and melanoidin.

**Alfalfa:** Alfalfa is one of the legume family and herb, its seeds, dry leaves, and sprouts are used as supplement. It is low Calorie, but high in vitamins K, C, and folate, and minerals copper, and manganese. It has been shown to lower cholesterol.

**Mushrooms:** These fungi, are nutritious powerhouses that heighten the body’s resistance to infections by increasing the activity of natural killer cells. They are rich in selenium, linked to resistance to flu.
There are many different kinds of mushroom: Common mushroom (Table or Champion mushrooms), Portabella mushrooms, Shiitake mushrooms, Oyster mushrooms, Enoki mushrooms, Chanterelle mushrooms, Porcini mushrooms, Shimeji mushrooms, and Morel (Marchella) mushrooms.

**Almonds, walnuts, and other nuts and seeds:** These nuts and seeds are rich in antioxidant, vitamin E, to ward off body viral infection, and omega 3 fatty acids good for heart health.
The different kinds of nuts are: Almond, Walnut, Peanut, Cashew, Brazil nut, Pistachio, Pecan, Pine nut, Hazelnut, Chest nut, Acorn, and Macadamia.
The different kinds of seeds are: Quinoa, Bread nut, Pumpkin seed, Sesame, Sunflower seed, Poppy seed, Lotus seed, Chia seed, Flax, Hemp seed, pine nut, and Buckwheat.

**Grapes and red wine:** These contain antiaging compound, resveratrol, which extend the life span.
Different kinds of grapes: Red Grapes: Moon Drops, Concord, Pinto Noir, Lemberger, Sweet Jubilee, Valiant, Champagne, Crimson Seedless, Kyoto, White: Cotton Candy, Riesling, Gewürztraminer, Moon Balls, Sultana.

**Wild salmon:** This fish contains heart-healthy omega-3 fatty acids, which fight against premature aging. New research shows that a diet rich in omega-3 fatty acids, help preserve bits of DNA, on the ends of chromosomes, called telomers. Shorter telomers are the sign of premature aging.

**Eggs:** Eggs are the most nutritious food on the planet. Even though they have some cholesterol, they are perfectly safe and healthy.
**Grapefruit and citrus fruits:** These fruits contain pectin which reduces blood fat. Also, they contain lots of vitamin C, as well as micronutrients, polyphenols and terpenes, which are powerful anti-inflammatory agents that inhibit the growth of cancer cells, reduce cholesterol levels, improve blood sugar levels, and increase blood flow. There are so many kinds of citrus fruits. Some of the major ones are: Mandarin orange, Bitter orange, Panama orange, Trifoliate orange, Valencia orange, Tangelo, Maye lemon, Kaffir lemon, Sweet lemon, Persian lime, Finger lime, Lemonade fruit, Grapefruit, Pomelo, and Clementine.

**Flavorful roots:** Flavorful roots are garlic, leeks, scallions, and onions. They are low in calories, and contain alliums, which improve overall heart health and decrease cancer risks. Also, they may be effective in lowering cholesterol. Also, spicy roots, such as horseradish, and turmeric contain powerful anti-inflammatory agents.

**Garlic:** Garlic contains allicin (diallyl sulfide) which help prevent blood clotting, lowers blood pressure, reduces fat and cholesterol, and suppresses cancer.

**Onion:** Onions contain vitamin C, which protect cells against damage caused by free radicals, and vitamin B6 (pyridoxine) and vitamin B9 (folate), which help red blood cell production, and nerve function. Also, onions have two antioxidants, quercetin (a flavonoid), which fight against inflammation, and fisetin, which has cancer fighting properties. The color of red onions is due to anthocyanins, which is antioxidant and is a red pigment.

Onions should not be refrigerated; they should be kept in a cool dark place.

Different kinds of onions are: Yellow onions, Sweet onions, Red onions, White onions, pearl, Maui, Shallots, Scallions (Green onions).

**Garlic, onion, shallots, scallion (green onions), and leeks** all have organic sulfur compounds, which give them the bad odor, and have anticancer properties.

**Flaxseed:** Flaxseed contain linolenic acid, an essential unsaturated fatty acid, which reduces tumor formation.

**Dark-colored fruits or tree fruits, and grapes:** The fruits having the color red, purple, and green, such as grapes and berries, as well as apples, pears, and plums, contain polyphenols, which are antioxidant and anti-inflammatory. Also, they are rich in fiber, especially when eaten with skin. Examples of their good ingredients are resveratrol (wine and grapes) and catechins (tea, apples, and berries).

**Blueberries:** Blueberries contain pterosilbene which reduces cholesterol, and has anti-inflammatory and anticancer effects in animals

**Berries:** Berries contain phenolic compounds, such as flavonoids (anthocyanins, tannins), and vitamin C which prevent inflammatory disorders, and cardiovascular diseases, and lowers risk of various cancers. Different kinds of berries are Cloud berry, Black berry, Blue berry, Boysen berry, Elderberry, Gooseberry, Tayberry, Lingo berry, Cranberry, Vaccinium, Bram berry,
Strawberry, Acai berry, Salmonberry, Loganberry, Currants, Red mulberry, Whit mulberry, Wine berry, Young berry, Viburnum, Lentigo, Juniper berry, Goji, Choke berry, Black raspberry, Sugar berry, Mulberry, Bilberry, and raspberry.

**Cherries:** Cherries contain fiber, vitamin C, carotenoids, and anthocyanins, which help in cancer prevention and anti-inflammatory action, which lowers risk of gout. It also has melatonin, especially sweet cherries, which improves sleep. Tart cherries are also good for arthritis.

Different kinds of cherries: Balaton, Bing, Lambert, Maraschino, Morello, Rainier, Royal Ann, Sour or tart Cherries.

**Cruciferous vegetables (Broccoli, red and green cabbage, collard greens, cauliflower, Brussel sprouts, kale, and bok choy):** These vegetables contain much glucosinolates which convert to compounds that can slow breast cancer cells growing in the lab. When eaten as a part of balanced diet, they lower the chance of Alzheimer disease. They also are rich in vitamin B, especially folate.

Broccoli contains indole carbinol, which breaks down estrogen (a hormone that promotes tumors).

**Kale and spinach:** Rich in vitamin K, essential for blood clotting, also contain lutein, or xanthophyll, that reduces the risk of cataracts, and eye disorders.

**Avocados:** Although avocados are rich in fat, they contain glutathione, an antioxidant that improves overall hormone function.

**Basil and mint,** a basil relative: Useful to aid digestion, and diminish inflammation, used for 1000’s of years in China, they are a good source for luteolin, a flavonoid, which may boost the immune system.

**Celery:** Celery contains Phthalide, which reduces cholesterol and causes mild sedation.

**Coconut:** Coconut belongs to Palm family which is grown in Southern Asia. It is used as a fruit which is confused for being a nut.

**Coconut flesh** (the white part of whole coconut) is highly nutritious and rich in fiber, vitamins C, E, B1, B3, B5, B6, and also many minerals such as iron, selenium, sodium, calcium, magnesium, and phosphorus. It also contains significant amounts of fats (called coconut oil), with medium-chain saturated fatty acids, in particular lauric acid, with antiviral, antifungal, and antibacterial properties. The melting point of coconut oil is around room temperature, which makes it solid in winter and liquid in summer. This is an excellent choice for frying.

**Coconut milk** is creamed coconut which is made when coconut flesh is grated and soaked in water. The coconut milk is white liquid which is squeezed out. Coconut milk has many benefits such as stimulating weight loss and lowering cholesterol. It contains no lactose (milk sugar), which milk has and causes lactose intolerance in some people. It is a great choice for vegans.
**Coconut water** is different from coconut milk. It is the clear liquid in center of coconut. It is low in fat but rich in easily digested carbs. It has a lot of health benefits especially in treatment diarrhea due to its electrolyte content.

**Cucumbers**: Cucumbers are the world most popular vegetable. It is low in carbs and Calories. It contains a number of nutrients including vitamin K, and lots of water. Different kinds of cucumbers: Armenian, Diva (F1), English Telegraph, Green Burpless- Mucher, G.B. Straight Eight, Homemade pickles, Lemon, Market more 86, Persian, Sayo Long.

**Apple cider vinegar**: Scientific name for vinegar is 5% acetic acid. Vinegar means sour wine, which is formed from fermentation of wine. It helps lower blood sugar, cholesterol, and blood pressure, acts as antibiotic, alleviates GI distress, fight ich, and causes moderate weight loss. Different kinds of vinegar, besides apple cider vinegar are: Distilled white vinegar, White vinegar or Champagne vinegar, Rice vinegar, Sherry vinegar, Malt vinegar, Balsamic vinegar, and Black vinegar.

**Sumac**: This herb, also called sumac, sumach, or sumaq (in Persian, we call it somaagh), is one of the 35 species of genus Rhus. It is grown in subtropical and temperate regions, especially East Asia, Africa, and North America, places like Sicily, South Italy, Middle East (particularly Iran).

This herb is used for its sourness and astringency (slight acidity and bitterness), preferred to lemon. It has many properties including regulating cholesterol levels, treating diabetes by regulating blood sugar, antifungal and antibacterial properties, helping treatment of skin inflammation and disorders.

**Ginger**: Ginger, which is cousin of turmeric, contains volatile oils, such as camphene or citral, and phenolic compounds, such as gingerol. These compounds have antioxidant function, digestive function, and immune function.

**Cinnamon**: This herb contains cinnamaldehyde which has antibacterial and antifungal properties. These properties cause fighting tooth-decay, bad breath, and infections. It also has antioxidants such as polyphenols, which can be used as natural preservative.

**Vanilla**: Vanilla is a spice which has many active ingredients, such as vanillin. It has several useful effects in their use. It is a powerful antioxidant, and has antibacterial and anti-inflammatory effects, and is mental health booster, fever reducer, and cholesterol stabilizer.

**Nutmeg**: This spice contains volatile oils, called terpenoids, like myristicin, eugenol, and elemicin. The hallucinogenic properties of nutmeg are due to myristicin and elemicin. These oils improve brain health by activating many neurotransmitters such as serotonin, dopamine, and norepinephrine in hippocampus. This makes the spice to be antidepressant.
Saffron: Saffron is used as an herb to give color and as spice in many foods, especially rice. It contains corcin, picrocorcin, safranal, the compounds which give it its taste, odor and color. Also, it has anthocyanin, alpha and beta carotene, and zegxantin. These active ingredients give it the following properties: Antioxidant, antibacterial, anti-tumor activity, and make it hepatoprotective. It can also be used for ADHD (attention-deficit/hyperactivity disorder) and depression.

Chia seeds: These seeds are the most nutrient dense food. They contain magnesium, manganese, calcium, and other nutrients, which makes it a useful food in drinks.

Grains: Grains are excellent source of starch and fiber. They include whole wheat, wheat flakes, wheat germ, bulgur, wheat, millet, oat bran, oats, popcorn (raw and cooked), barley and pearl barley, barley flakes, rye, whole-wheat flour, malt, rolled oats, brown rice, long-grain rice, short-grain rice, and cornstarch. Whole-grain bread contain fiber, which creates butyrate, a beneficial fatty acid with anti-inflammatory powers. Butyrate also crosses the blood-brain barrier and may help prevent neurological decline.

Flours: Flours are formed from grinding grains. They include: amaranth, arrow wheat (made from maranta roots, most digestive flour), barley, buckwheat (made from the same seeds as kasha, high in lysine), cornmeal, cottonseed flour, fish flour (produced from whole dried fish), oat, potato, rice, rye, soy, and triticale (hybrid of wheat and rye).

Breads: The different kinds of bread are: All white bread, wheat bread, whole wheat bread, and high-fiber bread. Also, there are: bagel, brioche, chapati, ciabatta, cornbread, English muffin, focaccia, matzo, multigrain bread, naan, pita, pumpernickel, quick bread, rye, sourdough, and tortilla. There is also a bread called Ezekiel, which is the healthiest bread, made up of organic sprouted whole grains and also, several types of legumes. In Iran, we have many other kinds of flat bread: Sangak, taftoon, barbari, and lavash.

Wheat: Wheat is one of the world most commonly consumed cereal grains. White and whole wheat flour are key ingredient in baked food such as pasta, noodles, semolina, bulgur, and couscous. Bread wheat or common wheat is the primary species. Several other closely related species include durum, spelt, einkorn, and Khorasan wheat. For people who tolerate it, whole-grain wheat can be rich in antioxidants, vitamins, and minerals. Also, it contains protein, carbs, sugars, fiber, and fat. 90% of the total carb in wheat is starch. Wheat, similar to white rice and potatoes rank high on the glycemic index, making them unsuitable for people with diabetes. On the other hand, some processed wheat products, such as pasta, are digested less efficiently, and do not raise sugar levels to the same extent.

Whole wheat is high in fiber, but refined wheat has none. The fiber is cellulose and hemicellulose. These fibers are insoluble in water, passing through digestive system almost intact, adding bulk to stool and making defecation easier. These fibers also feed your gut bacteria. Wheat has low percentage of proteins, which are gluten, a family of proteins responsible for the unique elasticity of wheat dough, making it good for bread-making.
Wheat also has selenium, manganese, phosphorus, copper and folate. It contains polyphenols, which are antioxidants. Another antioxidant of wheat is lutein, an antioxidant carotenoid, which give it yellow color, and it improve eye health. It has also been shown that whole grains reduce risk of colon cancer.

**Rice:** Rice is the seed of grass species Oryza sativa (Asian rice) and Oryza glabrmima (African rice). It has been used from 7000 – 5000 B.C. in Southeast Asia. Today, rice is one of the major foods consumed all over the world. It is made up of inedible covering, hull or husk, which needs to be removed before it can be consumed. What is under the hull is called kernel which has a multilayer outer skin, called bran, which is also removed in white rice. It has a tan color, reddish, or black, and is rich with antioxidants, B vitamins, and fiber. Inside, there is a small part, called germ, which is the embryo, has potential to sprout into a new plant. It contains B vitamins, some protein and fat, and minerals. The largest part of kernel is endosperm, the germ’s food supply, which contains starchy carbs, proteins, and small amounts of vitamins and minerals.

As far as texture, we have sticky rice, and parboiled rice, which has been through steam pressure before milling. As far as the shape, it is either long, medium, or short grain rice.

As far as color, one kind is polished rice, which outer layer of bran is removed, and is white, brown rice, which sheds its outer husk, keeping its bran and germ layer, and is tan colored. It has longer cooking time and is rich in vitamins and minerals. Then we have forbidden rice with high nutritional value, also called black rice, and has nutty flavor. We also have wild rice which is not a true rice but a different species of grass. It has lower Calories than brown rice, and 40% more proteins. All kinds of rice are gluten-free.

Different kinds of rice are Arborio rice, a medium grain rice, that is wide. When cooked, it is slightly chewy and sticky, with creamy texture, Basmati rice, which is long grain and separate, when cooked, and Jasmine rice, which has aroma of jasmine.

In some parts of the world, there is a shortage of food and is famine, which makes their food only rice. Rice lacks vitamin A, which is essential for vision in infant to be able to use their eyes. Without vitamin A, these kids go blind. To stop the vision loss, there has been genetically inserted beta carotene gene into the rice. This gives the rice an orange color. Beta carotene turns into vitamin A and keeps the children from going blind.

**Potatoes:** Even though the potatoes have been associated with Ireland, it was used by Peruvian Indians native to Andes Mountains, from 4000 years ago, and Spanish explorers brought them to Spain in 1500 A.D.

Potatoes are full of starch, making you full, and are very inexpensive. One should buy potatoes with few eyes and black spots, and avoid the ones with green tint, and remove any sprouts because of existence of solainine, a poison, with bitter taste, causing diarrhea, cramps and fatigue. They should be stored in a dark cool place, not in refrigerator. Also, potatoes and onions should not be placed together because the acid in onions causes decomposition of potatoes.

There are many kinds of potatoes:

Russet potatoes: Burbank, Norkotah, Ranger, Goldrush, and Centennial.

Yellow potatoes: Yukon Gold, Yellow Finn, Agata, Santina, Bontje.
Red potatoes: Chieftain, Norland, Red La Soda, Pontiac, Ruby.
White potatoes: White rose, Cascade, Superior, Kennebec, Cobbler.
Purple-Blue potatoes: Purple Peruvian, Purple Majesty, Adirondack.
Fingerling potatoes, petit potatoes, sweet potatoes, and yams.

Raw potato juice is used for stomach disorders, and water retention (edema). A purified protein powder made from potatoes is mixed with water and used to control appetite for weight loss. Potatoes are a good source of vitamins C, and B6, and minerals such as potassium, iron, phosphorus, calcium, magnesium, and zinc help body to build and maintain bone structure and strength and decrease blood pressure. Choline present in potatoes help in mood, and learning. It also helps to prevent some kinds of cancer.

**Fats and oils**: Fats and oils are a category of lipids, which are water-insoluble and exist in biological systems. Lipids include fatty acids, fats and oils, waxes, phospholipids, and steroid compounds (the major steroid is cholesterol, which turns into steroid hormones, such as cortisol, stress hormone, and sex hormones).

Since the lipids are hydrophobic (insoluble in water), when they are absorbed from intestines into blood, they are solubilized by making lipoproteins (lipids and proteins in a spherical moiety), such as LDL (low-density lipoprotein, or bad cholesterol) and HDL (high-density lipoprotein, or good cholesterol). They are called good cholesterol because their function is to remove cholesterol, and bad cholesterol because they deposit cholesterol everywhere including inside of blood vessels, causing arteriosclerosis and other cardiovascular diseases.

Fats are solid at room temperature, and oils are liquid. They are both formed from fatty acids and glycerol (glycerin), so called glycerides. Most glycerides have 3 fatty acids, so called triglycerides.

Depending on what kind of fatty acids triglycerides have, they are solid or liquid. Unsaturated fatty acids make the lipid oil, and saturated fatty acids make them fat. The fatty acid may be mostly saturated, or monounsaturated with one double bond, or polyunsaturated, with more than one double bonds. The essential fatty acid (the ones we cannot make in our system and need to get from diet) are linoleic acid and linolenic acid. If we do not take in these 2 essential fatty acids, arachidonic acid will not be made either, and will become essential.

The glycerides are listed below, according to be beneficial or be rejected:

**Animal fat**, higher ratio of saturated fatty acid, best for medium to high heat cooking:
- Butter, Ghee (clarified butter), Pork fat (lard), Beef fat (tallow or suet), Duck or goose fat, Chicken fat (schmaltz), Sheep fat (lanolin).

**Plant based**:
- Coconut oil, Red palm oil, Hemp oil.

**Monounsaturated**, should be stored in opaque bottle:
- Olive oil, Avocado oil, Macadamia nut oil, Hazel nut oil, Almond oil.

**Polyunsaturated**, store in refrigerator, in opaque glass bottle, never expose to heat:
- Sesame oil, Walnut oil, Rice bran oil, Flax seed oil.

**Should be avoided**, cause inflammation:
- Canola oil, Soybean oil, Corn oil, Vegetable oil, Grapeseed oil, Sunflower oil, Peanut oil, Rice oil, Palm kernel oil.
Run away from these oils:
Margarine, Vegetable shortening, Partially hydrogenated oils or hydrogenated oils in general, High stearate or stearic acid oils.

Harmful oils:
Trans fats (Naturally unsaturated fatty acids are cis. While hydrogenating oils, some trans fatty acid are produced. These are harmful for us, and raise LDL and lower HDL, bad for heart and blood vessels, cause inflammation, and can cause insulin resistance.
Mineral oil (large hydrocarbons, not glycerides), nonedible from petroleum, used as laxative in small doses.

Toxic oils:
Strong-flavored oils from spices:
Myristin from nutmeg, black pepper, carrots, parsley, and celery seeds: They are used in small amounts for flavoring (2 whole nutmegs can cause hallucination, headaches, nausea, and cramp).
Thujone: Anise flavored oil in wormwood, in banned liquor, absinthe.
Sassafras: Contains a toxic oil similar to thujone, no longer used in root beer.
High doses of menthol, from mint and peppermint, can cause dangerous irregularities in heart rhythm. (I am personally allergic to mint family and menthol, its active ingredient, which causes digestive disturbances, a great deal of flatulence).

Phospholipids: This category of lipids are good to be used moderately. They contain glycerol, phosphoric acid (or phosphate), and an alcohol base. These alcohol bases are choline, a brain food, which makes the phospholipid be called lecithin, and ethanolamine, which makes phospholipid called cephalin. These useful lipids are emulsifying agents (mix water and oil, into one phase, rather than separating from each other). This is why most candies, chocolates, cookies and cakes contain these phospholipids.
For the people who have lost their gall bladder (due to gall stones or other reasons), they should eat a lot of phospholipids with their meals so that the ingested lipid can be emulsified and better absorbed. Phospholipids are also the major part of cell membranes.

Black and white peppers: These herbs contain piperine in the outer fruit and seeds. However, white peppers have more piperine. Black and white peppers are processed differently. Black peppers are picked when almost ripe, and sun-dried, turning the outer layer black. White peppers taste hotter than black pepper, but they are less complex, have less flavor, and are more expensive.
These peppers are related to chilies or hot peppers (a wrong name because their active ingredients are different). They are both from the Western hemisphere, brought to Europe by Spaniard explorers.
Black and white peppers make you lose weight, relieve cold and cough, increase metabolism, and treat skin problems.

Sweet peppers (bell peppers) have different colors, related to their ripeness. They are from white color, to green, to yellow, to orange, to red, to purple. They are excellent source of vitamins A and C. Deeply colored peppers are high in bioflavonoids, a plant pigment, phenolic acids, which inhibit the formation of cancer-causing nitrosamines, and plant sterols, precursor
of vitamin D, which all protect against cancer. Red peppers contain Vitamins A, C, B6, folate, which support night vision, and are packed with antioxidants such as lycopene, which increase rate of metabolism.

Chili peppers or red peppers: Red chilies (not correct to say red peppers because it has different active ingredient than black pepper), contain capsaicinoid substances (genus capsicum), the hot ingredient which act directly on the mouth pain receptors, resulting in teary eyes, runny nose, and sweating. Chilies are more nutritious than sweet peppers. The red varieties are good source of antioxidants, especially vitamins A and C, and bioflavonoids, the plant pigments that help prevent cancer. Capsaicin, also may act as anticoagulant, helping to prevent blood clots that can lead to heart attack and stroke. They have no connection to causing ulcers or producing other digestive problems. However, they can cause rectal irritations in some people with hemorrhoids. They also can be used to treat aches and pains of the muscles and joints, and also, they are stimulant. The variety of chilies, depending their hotness is:

MILD TO MODERATELY HOT:
Anaheim (long slender red or green chilies), Ancho or dried poblano (dark red, heart-shaped, usually dried), Cherry (small round red, usually pickled), poblano (green chilies with small, tapered -shape, usually roasted, or stuffed).

HOT:
Cascabel (the round red or green, usually dried)

VERY HOT:
Cayenne (long red, usually dried or ground), Habanero (shaped like red, yellow, or orange lanterns), Jalapeno (tapered green or red, used fresh, canned, or pickled), Serrano (small bullet-shaped, green or yellow, usually used in hot salsas).

Cannabis sativa plant (Marijuana): Marijuana is used for getting high, has many active ingredients, including THC (tetrahydrocannabinol), the ingredient which makes you high, and CBD (cannabidiol), which does not get you high.

THC has many benefits: It blocks pain signals, eases nausea and vomiting, protects brain cells (neuroprotectant), help treat PTSD (Post-traumatic stress disorder), increase appetite, has antibacterial, antioxidant, anti-inflammatory, and anticonvulsant properties, and is anti-tumor agent, and is bronchodilator, and muscle relaxant.

CBD is not psychoactive, which makes it a dietary and natural supplement, has the following properties: help with pain, multiple sclerosis, epilepsy, Parkinson’s, inflammation, psoriasis, depression, bacterial infections, diabetes, nausea, anxiety, ADHD, schizophrenia, and substance abuse.
Harmful nutrients and non-nutrients in some common foods

Even though the above foods have many useful ingredients, some have harmful ingredients:

**Carbohydrates or sugars:** Sugars are a group of carbohydrates, which depending on the number of units are monosaccharides (single sugars), disaccharides (double sugar), and polysaccharides (complex carbs). **Glucose**, **fructose**, and **galactose** are monosaccharides. **Sucrose** (table sugar, made up of glucose and fructose, we use them for sweetening), **maltose** (malt sugar, made up of 2 glucose units), and **lactose** (milk sugar, made up of glucose and galactose) are disaccharides. **Starch** (plants only, made up of glucose units, amylose and amylopectin), **glycogen** (animal starch, similar to amylopectin but more branched), and **cellulose** (made up of glucose units, a major constituent of fiber) are polysaccharides.

We can breakdown all the above sugars using our enzymes, except for cellulose, which we do not have the enzyme cellulase to break it down. Only certain kind of bacteria have this enzyme, which ruminants (such as cows, sheep, etc.) and termites have them in their gut. However, fiber, which is mostly cellulose helps in the movement of feces in the gut and makes you more regular. Most fruits and vegetables have much fiber, which is good to consume a lot of them. We should consume only small amounts of sugars since they are inflammatory. Too much sugar makes many health problems such as diabetes, obesity, fatty liver, and memory loss.

**Honey:** Honey is a sweet, viscous food, produced by bees. It is a sugary secretion and plant materials made by regurgitation, enzyme activity, and water evaporation. Bees store honey in wax structures called honeycomb. It contains much carbs, 38% fructose, 31% glucose, 5% dextrin (dextrin is soluble gummy substance obtained from hydrolysis of starch, used as adhesive and dietary supplement), and 1.5-3% sucrose. Since too much sugar is bad for you, one should use only small amounts of honey. It also contains small amounts of proteins, enzymes, vitamins, minerals, antioxidants, flavonoids, and alkaloids. In small doses it soothes cough, boost memory, treat wounds, and has antiseptic and antibacterial properties.

**Agave:** Agave syrup, inaccurately known as agave nectar, is a sweetener, commercially produced from several species of agave plant. The constituents of agave depend on the species. Blue agave contains 56 - 60% fructose, 20% glucose, and a trace of sucrose. Consumption of fructose is worse than plain sugar. Agave and honey have the same number of calories. They both should be used in small amounts because they are loaded with sugars and too much sugar is bad for health.

**Artificial sweeteners:** The natural sweetener is sucrose (**table sugar**). It is a disaccharide, made up of glucose and fructose (two major monosaccharides). The monosaccharide glucose is 0.7 times as sweet as sucrose, and fructose is 1.7 times as sweet. The alcohol sugar monosaccharide, sorbitol is almost half as sweet as table sugar.

The artificial sweeteners are **saccharin** (Sweet’N Low), **aspartame** (NutraSweet), and **sucralose** (Splenda) and **cyclamates**. These compounds are shown to change good bacteria in the intestines with harmful bacteria, which cause both physical and mental illnesses. Some such as saccharin and cyclamate are also carcinogens. Cyclamates have been banned and have been removed from markets. **All artificial sweeteners should be avoided as much as possible.**
Stevia: The only sweetener which is not bad for you is Stevia, which is a natural glucoside (a sugar connected to another group), 30 – 150 times as sweet as table sugar. It is derived from plants (Asteraceae, which is related to daisy and ragweed). The leaves of this plant have been chewed from 1800’s as a sweet treat. It is used for burns, colic, stomach problems, and sometimes as contraceptive. Up to 1991 it was banned because it was thought to be a carcinogen. However, it has been approved as a sweetener and safe, by FDA since then.

Cruciferous vegetables contain goitrogens, which cause hypothyroidism (goiter).

Kernels of stone fruits and several varieties of beans (such as bitter almonds, apricot and cherry seeds and pits) contain organic cyanides which are potent poisons. Laetrile (amygdalin or vitamin B17) is the active ingredient, which is used for treatment of cancer and increasing longevity. However, it is debatable that it works. Another organic cyanide is Linamarin, which is in the leaves and roots of cassava (an herbal remedy plant), is used to treat cancer. Too much of these compounds causes fever, headaches, dizziness, liver damage, and even death.

Bananas, pineapple, aged cheese, wine, and chocolate: contain pressor amines (methoxamine), which increase blood pressure.

Nutmeg, parsley, and carrots contain myristicin, which cause hallucinations.

Raw cashews, and pistachios, and skin of mangos: These foods contain urushiol, which is also in poison ivy, poison oak, and poison sumac. They cause itchy skin rash.

Carrots contain falcaranols, which cause neurotoxicity.

Potato skin contain solanine (a potent poison), which interferes with transmission of nerve impulses.

Rhubarb and spinach: These two herbs contain oxalic acid and calcium oxalate, which can cause stomach irritations, kidney problems, shock and death. Rhubarb leaves have much higher proportion of oxalates than the stalks, so stalks are safer to eat than leaves.

Brazil nuts: These nuts contain radium, a radioactive element, which is in some soils, and get absorbed to the plant. Radium can cause cancer. Brazil nuts also have much selenium, a nonmetal, a nutrient which the body needs to be healthy and helps prevention of cancer. However, too much selenium can cause selenosis. This condition can produce hair loss, nail loss, nausea, irritability, fatigue, and nerve damage.

Wheat: Small amount of the fiber in wheat is soluble in water (fructans) that cause problems in people with irritable bowel syndrome (IBS). It also contains gluten (a group of proteins) which has adverse effect in people with gluten intolerance. It causes celiac disease, which causes a harmful immune reaction, characterized with weight loss, bloating, flatulence, diarrhea,
constipations, stomach pain, and fatigue. Wheat also has phytic acid which impairs absorption of minerals.

White bread is low in fiber and causes unhealthy bacteria to gain the upper hand in your digestive system, contributing to leaky gut, in which toxins are allowed to pass through in your body rather than being swept away by digestive system.

**Deep fried foods:** When meats and grains are cooked in high heat (such as doughnuts, French fries, and fried chicken), inflammation-causing compounds such as advanced-glycation end products (AGE’s) are produced which are unhealthy.

**Processed foods:** Most processed foods such as puddings or other deserts, are low in fiber, high in sugar, and packed with chemicals, all of which are bad for your gut. The more you cook at home with fresh ingredients, the better it is.

**Bottled salad dressings:** If you read the ingredients in these products, by reading labels, you realize that they are loaded with water, sugar, and bad oils (soybean oil, soy and vegetable oils). The best way is to make your own salad dressing, with fresh lemon juice or vinegar, extra-virgin olive oil and herbs and/or seeds.

**BHA (butylated hydroxy anisole), and BHT (butylated hydroxy toluene):** These two compounds are used as preservative, in many products such as cereals. They are considered to be mildly carcinogenic. Vitamin E is a better choice as preservative than these two compounds.

**MSG (monosodium glutamate):** This food additive is sodium salt of glutamic acid, a neurotransmitter in nervous system. It is used mostly in Asian foods to enhance the savory, meaty umami flavor of foods. (Umami is the fifth basic taste (along with salty, sour, bitter, and sweet)). There is controversy about this additive. It is thought that its use causes asthma, headaches, and even brain damage. It has been shown to cause excessive stimulation of nerve cells, so called excitotoxin, and that high doses of MSG lead to destruction of nerve cells in young mice. It exists in most foods to some extent and FDA considers it to be safe. However, its use should be avoided as much as possible.

**Artificial fats:** Artificial fats are Olestra, Simplesse, and trans fats. **Olestra** is sucrose (table sugar), connected to many fatty acids. It is a giant hydrophobic (water-hating) molecule, which feels like fat but cannot be absorbed in intestines. It goes in and comes out.

**Simplesse** is a protein, made from whey proteins, which has lower Calories than fats. But it cannot be heated or frozen, because it loses its feeling like fat.

**Trans fats** are made from cis fats, which are the natural form of fat. Trans fats cause arteriosclerosis, deposits of cholesterol and other ingredient on blood vessels. **The artificial fats should be avoided as much as possible.**
**Belly fat:** Having a big belly means you have excess visceral fat, the fat that would be around your internal organs, especially intestines. This causes secretion of molecules that cause inflammation.

**Nicotine:** Cigarette smoking produces 7000 chemicals, including carbon monoxide (a potent poison), hydrogen cyanide (used in gas chambers), and nicotine, a carcinogen and addictive element in cigarettes. It is the worst thing you can do to yourself. **Avoid cigarette smoking or quit as soon as possible.**

*If you want to avoid these poisons, you should eat a variety of different foods rather than a lot of one kind of food.*