

## Nutritious Diet

A nutritious diet is important in the prevention and cure of numerous diseases and is also essential for maintaining the energy and productivity of employees. A nutritious diet, while ensuring overall well being, helps to maintain a healthy body mass index (BMI), reduces the risk of several comorbidities such as cancer, cardiovascular disease, hyperlipidemia, diabetes, osteoporosis, and stroke. A balanced diet consisting of whole grains, fresh fruits and vegetables, lean protein, healthy fats, and low fat calcium rich products can give the body the nutrition it needs for daily function and long-term health. These are the macro and micro nutrients that the body needs to sustain a quality life.

Macronutrients are the essential nutrients that the body needs in large (macro) amounts. These nutrients include carbohydrates, protein, and fat. While it is essential that these nutrients work together, separately they all play significant roles in maintaining a healthy body.

### Carbohydrates

Not all carbohydrates are created equal. This category of food contains sugar, starch, and fiber, while providing a vast array of vitamins, minerals, protein, and some healthy fat.

This macronutrient is the primary source of energy for the human body. The liver breaks down carbohydrates into glucose (blood sugar) and uses this sugar for energy for cells, tissues, and organs. Since this job is so essential to basic brain and body function, we need this macronutrient in the largest amount.

1. **Complex Carbohydrates.** The classification of carbohydrates depends on how quickly the sugar is digested and absorbed. Complex carbohydrates contain three or more double bonds in its chemical structure compared with only one or two in the simple sugars. The extra bonds in complex carbohydrates take longer to hydrolyze (break down in water), so they keep individuals feeling fuller longer. Good sources of carbohydrates include:
  - Breads such as whole grain, multi-grain, oat bran, spelt, or buckwheat;
  - Bulgur, quinoa, brown rice, whole grain pasta enriched with omega 3 fatty acids;
  - Sweet potatoes, corn, rutabagas, parsnips, beets, carrots;
  - Oatmeal, popcorn, barley, and edamame and other soybeans.
  - Vegetables such as green beans, spinach, broccoli, brussel sprouts, asparagus, zucchini, tomatoes, and cauliflower; and

- Black beans, garbanzo beans, lentils, navy beans, and split peas.

2. Simple Carbohydrates or Simple Sugars. Simple carbohydrates have become known as the bad carbs because the grain has been removed of all bran, fiber, and nutrients. They are more readily and knowingly found in refined sugar and in processed foods that are broken down before being put back together again in an unnatural way such as to produce a sweet product like soft drinks and candy. These types of sugars can promote unwanted weight gain, elevate triglyceride levels, increase risk for heart disease, and spike blood sugar levels, causing the pancreas to work harder in producing insulin, which is relevant in those predisposed to Type 2 diabetes.

It is natural to like sweets. And it is okay to enjoy them as a healthy indulgence, but it is fundamental to keep consumption in moderation. Choose sweet treats that are homemade or have a naturally occurring sugar such as fruits. Try making a favorite dessert with half or one-third less sugar than usual. When purchasing sweet treats look for corn syrup, dextrose, sugar, sucrose, maltose, fruit juice concentrates, or molasses on the label, if any are the first 5 ingredients, consume sparingly.

3. Fiber. Dietary fiber is found in plant foods such as fruits, vegetables, and whole grains, and is essential for maintaining a healthy digestive system. Fiber helps individuals feel fuller faster and longer, which can help prevent overeating. Fiber also slows digestion and absorption so that glucose (sugar) enters the bloodstream slowly and steadily, keeping blood sugar levels even. The simple organic acids produced when fiber is broken down in the digestive process helps to nourish the lining of the colon, maintaining a healthy colon. A healthy diet should contain approximately 25 to 30 grams of fiber a day, but most of us only get about half that amount.

## **Protein**

This complex organic chemical makes up parts of every cell, tissue, and organ in the body. It is important to get enough, but not too much low fat protein, on a daily basis. Every enzyme in the body is a protein molecule that plays significant and vital roles in development, metabolism, and gene expression. Much like carbohydrates, all proteins are not created equal either.

1. Amino Acids. Once proteins go through the digestion process, they are broken down and become amino acids. Amino acids carry out virtually every cellular process in the human body. The 20 amino acids produced from protein are either known as essential amino acids or non-essential.
- Essential Amino Acids. The human body can provide 10 (non-essential) of the 20 amino acids. It is essential that the remaining ten of these come from the diet. The essential amino acids are threonine, valine, tryptophan,

isoleucine, leucine, lysine, phenylalanine, methionine, histidine, and arginine. Arginine and histidine are known as conditionally essential amino acids, meaning that they are only required in the diet during growing years, infancy, and childhood and in some stressed states, such as for those with wound healing needs.

- o Branched-Chain Amino Acids (BCAA). Of the essential amino acids, leucine, isoleucine, and valine are known as the branched-chain amino acids. The non-linear structure of their molecule gives them their name. These trios of amino acids are vital in the maintenance of muscle tissue, prevention of muscle breakdown during exercise, and preservation of muscle glycogen stores, and make up one-third of muscle protein.
- Non-Essential Amino Acids. The ten remaining amino acids are synthesized within the body. These ten are arginine, alanine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, proline, serine, and tyrosine. Of these non-essential acids, cysteine, glycine, glutamine, proline, serine, and tyrosine are considered conditionally essential. The significance of essential amino acids or non-essential amino acid is necessary for vital health. A deficit in only one can have significant impact on the human body.

2. Complete Proteins. Complete proteins are food sources that contain all of the nine essential amino acids listed above. These sources of food are found primarily in animal sources such as: meats, cheeses, milk, eggs, and yogurts. Soybeans are the only non-animal source of protein that contains all of the essential amino acids.

3. Incomplete Proteins. Plant proteins can be a significant source of protein when combined with other protein-containing plants. Plants that lack in one or more amino acids are defined as incomplete, but when combined with other protein-containing plants, can make a complete protein fit for any vegetarian! Examples of combined complete proteins include beans and rice. Beans lack in lysine and rice lacks in methionine, making them a perfect pair of complete protein. Other foods that are incomplete proteins include beans, peas, nuts, grains, and some vegetables.

4. High Biological Proteins. This term is used interchangeably with complete protein. The biological value (BV) of a protein indicates how closely matched the amino acids are in relation to the body's requirements. When mentioned that someone is consuming a high biological protein diet, it is assumed that their diet is high in complete proteins; however, within the realm of complete proteins, the

biological value of them can vary somewhat. Complete proteins broken down into order of highest biological value looks like this:

- Whey protein (BV 100+);
- Eggs, whole (BV 100); and
- Dairy, meat, fish, egg whites (BV 70-100).

These values measure the percentage of protein that is actually used for muscle and connective tissue growth and repair. That is why whey, protein, and eggs are staples in strength training.

## **Fat**

This macronutrient is a vital nutrient that is needed for the absorption of fat soluble vitamins, maintaining healthy skin and hair, aiding in body temperature control, and is essential for optimal cell health. The right type of fat (e.g., essential fatty acids) is essential to diets; in fact, its absence can create specific deficiency diseases. Like protein, fat is also known as essential or non-essential.

### 1. Non-Essential Fatty Acids.

- **Saturated Fatty Acids.** All available bonds of carbon are filled with hydrogen; in fact, it is saturated in hydrogen, making it solid or hard at room temperature. A diet high in this non-essential fat causes a soft waxy substance (cholesterol) to build up in the arteries. This increases the risk of heart disease, and because fat provides nine calories per gram (more than twice the number provided by carbohydrates or protein), foods high in fat content should be consumed in moderation to decrease unwanted weight gain and obesity-related health problems.

Saturated fats are the fats that come primarily from animal sources such as meats, eggs, and dairy products such as cream, cheese, and butter, although some tropical oils such as coconut and palm contain a significant amount as well. These oils are found mostly in the processing of packaged cakes, cookies, and snack foods. New research is now being conducted on coconut oil and the possible health benefits of it in the diet, so be sure to watch for changing nutrition information on this fat!

- **Cholesterol.** A soft waxy substance found in blood stream and all healthy cells. Not needed in the diet, the liver produces what the body needs to fulfill functions such as forming cells and hormones. When excess of dietary cholesterol is consumed [more than 200 milligrams (mg) per day], it can slowly build up in the walls of the arteries causing potential damage

to the heart and brain. Cholesterol is found only in foods of animal origin such as eggs, meat, poultry, fish, and dairy products.

- **Trans Fatty Acids.** Trans fat comes from adding hydrogen to vegetable oil through a process called hydrogenation. Once thought to be a healthy alternative to saturated fats, numerous studies have now found that partially hydrogenated fat both increase low-density lipoprotein (LDL) (raise bad cholesterol) and decrease high-density lipoprotein (HDL) (lower good cholesterol). Recent labeling laws require that trans fat content be listed on the label. The loop hole is that servings under 0.5 grams can be listed as 0 grams, so, read the labels! Even though that seems like an insignificant amount, numerous servings can exceed recommended limits. Food sources of trans fatty acids are typically found in commercial baked goods such as crackers, cookies, donuts, snack cakes, breakfast tarts, and fried foods such as French fries and donuts. Even though the cover reads, “no trans fat”, be sure to check the list of ingredients for the hidden truth.
  
- 2. **Essential Fatty Acids (EFAs).** These fats have become known as the good fats, or as some like to call them, good choices! Well known for their positive influence in cardiovascular, reproductive, and immune response, these fats are needed in the diet for optimal health. Two families of EFAs are needed for basic body functions such as regulating heart rate, blood pressure, blood clotting, and fertility. These classes of fats are long-chain polyunsaturated fatty acids (PUFAs) derived from linolenic (Omega-3), linoleic (Omega-6), and oleic acids (Omega-9) all containing different ratios of EFAs.
  
- **Omega 6.** This class of EFAs is crucial in the promotion of brain function as well as normal growth and development. A healthy diet should consist of 2-4 times more omega-6's than omega 3's. A typical Western diet contains 14-25 more times omega-6's than 3's. Although essential to the diet for vital function, this class PUFA should be used in moderation due to its ability to lower LDL cholesterol (a good thing) but also lower HDL cholesterol (not a good thing). This high intake of Omega-6 in the western diet may be attributed to the rise of inflammatory diseases within the United States. Types of Omega-6 include:
  - o Gamma linolenic acid;
  - o Linoleic acid; and
  - o Arachidonic acid.

Excessive intake of Omega 6 can also cause increased water retention, raised blood pressure, and raised blood clotting. Only a small amount of this fat is needed essentially and can also be provided through many Omega-3 sources. When selecting oils, concentrate on Omega-3's that generally include sources of Omega-6. Common food sources of Omega-6 include corn, soybean oils, sesame oil and seeds, and flax seed.

- Omega 3. Also known as PUFAs, these essential fats play a crucial role in brain function as well as normal growth and development.
  - o Eicosapentaenoic acid. Fish oil fatty acids are rich in this class of Omega 3's. Proven to reduce inflammatory response and aid in relieving pain caused by arthritis and prostatitis, eicosapentaenoic acid lowers cholesterol, triglycerides, blood pressure, and LDLs, while sparing or increasing good HDL cholesterol.
  - o Docosahexaenoic acid (DHA). Found in fish oils also, this Omega-3 benefits both the body and mind and is beneficial to pregnant and nursing mothers, impacting brain development in their young.
  - o Alpha-linolenic acid (ALA). Regulates blood clotting and dilation of blood vessels, and facilitates blood flow and pressure.

Common sources of Omega 3's include salmon, trout, white tuna albacore, anchovies, flax seed, canola oil, almonds, peanuts, pecans, and walnuts (the best nut source) (refer to list attached).

- Omega 9. A monounsaturated fat that is not harmful in moderation. Although not technically an EFA because the body can produce a certain amount, this minimal essential requirement can be picked up in one tablespoon of olive oil. Monounsaturated fats have been shown to lower LDL cholesterol while sparing or raising HDL. Primary sources are canola, olive, and peanut oil. Other good sources are avocados, olives, almonds, hazelnuts, and pumpkin and sesame seeds.

How much fat in the diet is too much? Many factors contribute to an individual's dietary fat needs. They include age, weight, lifestyle, and most importantly, the state of health. Focus on including monounsaturated fats and polyunsaturated fats in the diet, decreasing saturated fats, and avoiding trans fats as much as possible. The U.S. Department of Agriculture (USDA) recommends that the average individual:

- Keep total fat intake to 20-35 percent of calories;

- Limit saturated fats to less than 10 percent of calories consumed (200 calories for a 2000 calorie diet);
- Limit trans fat to 1 percent of calories consumed (2 grams per day for a 2000 calorie diet); and
- Limit cholesterol to 300 mg per day, less if high blood pressure, heart disease, renal problems, or diabetes is present.

### **Vitamins and Minerals**

Vitamins and minerals are nutrients that the body needs to grow and develop normally. These essential nutrients are found in food because the body cannot make the majority of them. They are mandatory in the prevention of certain deficiencies and for maintaining a healthy body.

There are 13 vitamins that the body needs. They are vitamins A, C, D, E, K and the B vitamins (thiamine, riboflavin, niacin, pantothenic acid, biotin, vitamin B-6, vitamin B-12, and folate). The body can also make vitamins D (to a certain extent) and K.

Just like vitamins, minerals help the body grow, develop, and stay healthy. Common minerals include calcium, iron, zinc, phosphorous, magnesium, and many less-recognized minerals that are needed for good health.

### **Choosing Vitamin/Mineral-Rich Foods**

The following list can help you choose foods that are rich in vitamins and minerals.

#### 1. Foods rich in vitamin A

- |                  |                        |                  |
|------------------|------------------------|------------------|
| ▪ Apricots       | ▪ Kale                 | ▪ Sweet potatoes |
| ▪ Broccoli       | ▪ Orange winter squash | ▪ Swiss chard    |
| ▪ Cantaloupe     | ▪ Pumpkin              | ▪ Tomatoes       |
| ▪ Carrots        | ▪ Spinach              | ▪ Turnip greens  |
| ▪ Collard greens |                        | ▪ Watermelon     |

#### 2. Foods rich in vitamin D

- |                 |                  |                                 |
|-----------------|------------------|---------------------------------|
| ▪ Cod liver oil | ▪ Fortified milk | ▪ Fish bones (sardines, salmon) |
|-----------------|------------------|---------------------------------|

#### 3. Foods rich in vitamin E

- |                |                          |              |
|----------------|--------------------------|--------------|
| ▪ Fish         | ▪ Vegetable oils         | ▪ Legumes    |
| ▪ Nuts         | ▪ Green leafy vegetables | ▪ Wheat germ |
| ▪ Whole grains |                          |              |

#### 4. Foods rich in vitamin K

- Cauliflower
- Green tea
- Dark-green leafy vegetables
- Soybean oil

#### 5. Foods rich in thiamine (vitamin B1)

- Brewer's yeast
- Organ meats
- Whole grains
- Enriched flour
- Pork
- Legumes
- Wheat germ

#### 6. Foods rich in riboflavin (vitamin B2)

- Dry yeast
- Milk and dairy products
- Peanuts
- Green leafy vegetables
- Organ meats
- Whole grains
- Peanut butter
- Eggs

#### 7. Foods rich in niacin (vitamin B3)

- Brewer's yeast
- Meats
- Legumes
- Enriched white flour
- Whole-grain flour products

#### 8. Foods rich in calcium

- Soy products
- Cottage cheese
- Milk and dairy products
- Tofu
- Fish bones-sardines, salmon
- Plain low fat yogurt
- Dark-green leafy vegetables
- Calcium fortified orange juice

#### 9. Foods rich in magnesium

- Apricots
- Nuts
- Wheat bran
- Bananas
- Seafood
- Dark-green vegetables
- Coffee
- Soybeans
- Tea
- Whole grains

10. Foods rich in phosphorus

- Eggs
- Meats
- Soft drinks
- Legumes
- Milk and dairy products
- Whole grains

11. Foods rich in potassium

- Apricots
- Prune juice
- Oranges
- Bananas
- Spinach
- Peanut butter
- Broccoli
- Legumes
- Potatoes
- Tomatoes
- Meats
- Raisins
- Mango
- Chocolate
- Avocado
- Grapefruit
- Molasses
- Papaya
- Nuts, Seeds
- Milk and dairy products

12. Foods rich in sodium

- Salt

## Reference

[http://www.rd411.com/index.php?option=com\\_content&view=article&id=461:vitamins:-choosing-vitamin-rich-foods&catid=79:vitamins-and-minerals&Itemid=358](http://www.rd411.com/index.php?option=com_content&view=article&id=461:vitamins:-choosing-vitamin-rich-foods&catid=79:vitamins-and-minerals&Itemid=358)



Employee Health Promotion  
Disease Prevention

---

Center for Engineering & Occupational Safety and Health, and  
Occupational Health Strategic Healthcare Group, Office of Public Health (10P3)  
Veterans Health Administration, Department of Veterans Affairs  
[www.publichealth.va.gov/employeehealth](http://www.publichealth.va.gov/employeehealth)