'S OF NUTRITION

Nutrients are substances which are essential for the maintenance, repair, growth, and reproduction of all our body tissues. Our foods contain the following basic nutrients: carbohydrates, fats, proteins, and water.

Carbohydrates, our body's most efficient source of energy and an essential component in the production of many structural and functional materials, are produced by plants in the process of photosynthesis. They are made of compounds of carbon, hydrogen, and oxygen called sugars or saccharides. Molecules of these simple sugars attach together to make long branching chains that are called complex carbohydrates. These large carbohydrate molecules are also commonly referred to as starch.

Once you eat them, digestion by intestinal enzymes disassembles these chains back into the simple sugars, which then pass easily through the intestinal wall into the bloodstream, where they journey to the body's tissues. Metabolic processes change these simple sugars into energy, which provides fuel for the body's activity.

Dietary fibers are even longer chains of complex carbohydrates. Unlike starch molecules, these fibers resist digestion because of their chemical configurations. Therefore, most fibers eventually end up in the colon and form the bulk of your stool. Most people think that fibers are only the husks of grains and the long stringy components in fruits and vegetables, but actually, dietary fibers are present in all plant tissues. For example, after a potato is peeled, the white matter we eat has plenty of relatively indigestible fibers in it.

Fats too are complex molecules made up of carbon, oxygen, and hydrogen. Although they are not as easily digested as sugars are, fats are sources of energy and they provide important structural materials for building different components of the human body. Fats are divided into two categories: saturated fats (solid at room temperature), found mostly in animal tissues, and unsaturated fats (liquid), found mostly in plant tissues. Most fats can be synthesized by our own bodies from carbohydrates as they are needed. The fats that we can synthesize are said to be nonessential because they are not necessary ingredients in our diet. The only fats we cannot synthesize for ourselves are a few unsaturated fats. They must be provided to us, ready-made, in our foods and therefore are called essential fats.

Proteins provide the raw materials for a large part of the functional and structural components of

our bodies. Only as a last resort are they used as a source of energy. The building blocks that make up all proteins are called amino acids. Various combinations of the same twenty two- amino acids, put together as are the letters of the alphabet that can form a whole dictionary of words with different meanings, make all of the proteins in nature. Proteins are found in all foods derived from animals and plants, unless they have been removed or altered by refining processes. Only eight of the twenty-two amino acids are essential to us, because they cannot be made in human metabolism. These eight essential amino acids must be present in sufficient quantities in our food for us to enjoy good health.

Water makes up a large part of our foods. Although it yields no energy, for many reasons water is an essential element for life. It is not just a passive solvent in which salts, compounds and gasses interact; water participates actively in forming building blocks of cells and is the environment in which cells live. Approximately 60 percent of body weight is water.

Because the four nutrients discussed above - carbohydrates, fats, proteins, and water make up the largest portion of any foodstuff by weight, they are often referred to as macronutrients. Our foods also contain two micronutrients--vitamins and minerals--which make up only a tiny percentage of our food by weight.

Vitamins are organic compounds that are synthesized for the most part only by plants and bacteria. Humans and most large animals can synthesize vitamin D (with the help of sunlight), and some animal species can make vitamin C (ascorbic acid). Thus, our supply of vitamins must come from plant foods and our own bowel bacteria. Vita means life, and, as the name indicates, vitamins are essential for our existence. Without adequate amounts, disease can develop.

Minerals are also micronutrients, but they come from inorganic matter, primarily the earth. Their presence in adequate amounts in our foods is also essential for our good health. They participate in thousands of metabolic reactions that must take place throughout the body. For instance, iron in the enzyme hemoglobin transports oxygen in our red blood cells. Some minerals are important elements in our structural material. Calcium, for example, is a large part of bones and teeth.

Our foods also contain various non-nutrients, substances that are not necessary for life or good health. Many of these substances, such as cholesterol, pesticides, herbicides, and additives, present real threats to our health. Even though these non-nutrients make up a small amount by weight of our foods, their health significance can be great, causing problems such as heart disease, cancer and allergies.

Carbohydrates are made by plants and stored in their leaves, stems, roots, and fruits. Plant foods contain both simple and complex carbohydrates in various amounts. Fruits are often more than 90 percent carbohydrate, but most of their carbohydrates are the sweet-tasting simple forms of carbohydrate, such as glucose and fructose. Green and yellow vegetables store most of their calories

as complex carbohydrates, but since they contain very few total calories the amount of complex carbohydrate they provide in the diet is small. Whole grains (rice, corn) and the whole grain flours (wheat, rye) and whole grain pastas (wheat, soba) made from them, tubers (potatoes, yams), legumes (beans, peas), and winter squashes (acorn, hubbard) contain large quantities of complex carbohydrates and thus are known as starches. Rice, corn, and other grains, and potatoes typically store about 80 percent of their calories in the form of complex carbohydrates. Beans, peas, and lentils are approximately 70 percent complex carbohydrates.

Starches contain sufficient calories to easily meet the energy requirements of the active person, and they are abundant in proteins (with all their essential amino acids), essential fats, fibers, and minerals required to meet our daily dietary needs, Many starches, such as the maligned potato, have a full complement of vitamins as well. (Grains and legumes need the help of fruits or green and yellow vegetables in order to provide adequate vitamin A and C.)

You have probably heard that marathon runners and other endurance athletes "load up" on carbohydrates before an event, devouring large meals of spaghetti, rice, and potatoes in order to store energy-providing carbohydrates for the long race. Carbohydrate-loading several times a day will give you too the energy to race through your busy life.

The only food from animals in which a carbohydrate is found in significant amounts is milk, which contains a simple sugar called lactose. However, lactose cannot be digested by most adults,* and consequently, when they drink milk, they suffer assorted evidences of indigestion, such as diarrhea, stomach cramps, and hurtful amounts of gas. In the sense of total amount of carbohydrates in their diet, Americans eat far too few calories from this source--only about 40% of their diet is carbohydrate. To make things worse the kinds of carbohydrates eaten are mostly "empty calories" in the form of white sugar, corn syrup, and fructose. A healthy diet, like the McDougall diet, is more 80% carbohydrate from nutritious foods--starches, vegetables and fruits.

Percent of calories found as carbohydrates in various foods

Almonds	13	Beans (kidney)	72	Beef	0
Bread (whole wheat)	75	Brussels Sprouts	74	Cabbage	85
Carrots	92	Cheddar Cheese	2	Chicken	0
Corn	94	Eggs	2	Grapefruit	93
Lobster	1	Milk (whole)	30	Oatmeal	71
Oranges	88	Peanuts	16	Peanut Butter	15
Pork	0	Potatoes	90	Rice (brown)	89
Spaghetti (whole wheat)	81	Sugar*	100	Sweet Potatoes	92
Tofu	23	Tomatoes	85	Turkey	0

*When we hear or read the word sugar most of us think of granular white table sugar. Unlike the simple sugars found in ripe fruit, this kind of sugar should be eaten only in limited quantities. After the refining process, it contains no fibers, proteins, essential fats, vitamins, or minerals. It is purely concentrated sugar. Nothing could better deserve the descriptive term "empty calories," because calories is all it provides. Although refined sugar can provide energy, too much refined sugar in the diet can lead to tooth decay, contribute to obesity, and raise triglycerides. A nutritional imbalance, weakening the body's defense and repair system making us susceptible to disease processes from infection to cancer, may result when "empty calories" make up a substantial part of the diet.

Fibers are made only by plants and FOUND ONLY IN VEGETABLE FOODS. There is no fiber in beef, pork, chicken, lobster, cheese, egg, or other animal-derived foods.

Grams of fiber present in portions of food that yield 100 calories

Beans (kidney)	1.5	Bread (whole wheat)	0.7	Brussels Sprouts	4.4
Cabbage	4.3	Carrots	2.3	Cauliflower	3.7
Corn	0.7	Green Beans	4.0	Grapefruit	0.8
Kale	3.4	Oatmeal	0.3	Oranges	0.9
Peas	2.4	Peanuts (with skin)	0.8	Peanuts (without skin)	0.3
Potatoes	0.6	Radishes	4.1	Rice (brown)	0.2
Scallions	2.0	Soybeans	1.4	Spaghetti (whole wheat)	0.6
Sweet Potatoes	0.6	Tomatoes	2.3	Tofu	0.1
Yams	0.9				

THE FOREGOING IS OFFERED by **LORRAINE DAVERSA**, MFT,
NUTRITION, SPORTS AND LIFESTYLE COACH AND CONSULTANT
CERTIFIED WHOLE FOOD, PLANT-BASED NUTRITIONIST
BACHELOR DEGREE IN NUTRITION AND DEVELOPMENT,
MASTER DEGREE IN PSYCHOLOGY,
CERTIFIED YOGA INSTRUCTOR,
AVID CROSS-TRAINED ATHLETE,
MOTHER OF TWO WONDERFUL SONS, ONE AN INTERNATIONAL GOLD MEDAL GYMNAST.
LORRAINE@LORRAINEDAVERSA.COM OR CALL ME AT 609-502-0880