



8.

The Nutrients

ENERGY IS AN ABSOLUTE NECESSITY, but to supply energy isn't the only reason we eat. We need materials for the body's growth, repair, and upkeep. During growth we must have large amounts of every kind of building material for muscle, bone, blood, vital organs, and other tissues. When growth is complete, smaller amounts of the same materials are needed for upkeep and repair. Also we need materials to regulate body processes, to keep everything about the body running in an efficient, orderly fashion.

All these different needs require different kinds of materials, called *nutrients*. There are at least fifty nutrients — many vitamins and minerals, amino acids from protein, fatty acids from fat, and starches and sugars.

Our plan of action to reach the goal of good eating and good health is first to choose foods containing calories which keep company with an abundance of these nutrients until all of our nutritional needs — except energy — have been supplied. After that we can choose calories from any source until our energy requirement is met.

To carry out this plan we need to know something more about foods than just their calorie values. If we choose our foods with thought for only their calorie values, we can wind up a day having had all the food our stomachs will hold, but obtaining very little nourishment for our health and vitality.

TOGETHERNESS!

Many of the nutrients occur together in our foods, and this fact greatly simplifies the job of selecting a nutritionally adequate diet.

Knowing about the nutrients, what foods supply them, and why we need them adds purpose and interest to our everyday eating habits.

You probably will recognize the names of the ten prominent nutrients as they are listed in the first column of the table on pages 88 and 89. Their special jobs in the building, upkeep, and operation of the body are listed in the second column. These are the jobs that cannot be done by other nutrients. Having an extra supply of one nutrient cannot make up for having a shortage



of another. In addition to these individual jobs, there are also jobs, not described here, that require several nutrients to work together to perform some services for the body that no one nutrient can do alone.

The foods we can depend on to supply the nutrients, and their followers as well, are listed in the third column. As you study the chart you will notice:

Some foods can be grouped together because they supply important amounts of the same nutrients. For examples: breads and cereals; meat, fish, poultry, and eggs; milk, cheese, and ice cream.

Some foods supply important amounts of several of these ten leader nutrients. Some of these foods are: milk, cheese, meat, fish, poultry, and eggs.

Since no one group of foods supplies important amounts of all ten of the nutrients, it takes many kinds of food to supply all the dietary essentials for good health. This makes eating more interesting!

THESE, TOO

Here are just a few of the other nutrients which you hear mentioned frequently and which also do important jobs for a well-nourished, well-functioning body:

Phosphorus is needed in the soft tissues of the body and to combine with calcium to make bones and teeth.

It is present in the foods that also supply protein and calcium.

Copper helps the body make iron into hemoglobin for the blood. It occurs in many foods.

Iodine is needed for the thyroid gland to make the hormone called thyroxin, which regulates the speed of

some of the body processes. Iodine follows protein in sea food. Most of the iodine comes from the air, which picks it up from the sea, carries it overland, and drops it on the soil, on garden foods, and into water supplies. In areas such as the North Central States where there is no sea air, there is not enough iodine in the food, and iodized salt has been developed to supply this essential nutrient.

Fluorine helps the teeth resist decay. It is present in some water supplies and not others.

Niacin, a vitamin, is needed to maintain the health of the skin, tongue, and digestive system and to help the cells use oxygen. It is present in the foods that supply protein.

Folic acid, pyridoxine, pantothenic acid, and vitamin B₁₂ are other essential vitamins that occur in many foods.

Water is an essential although people do not usually think of it as a food. We must have it to help carry nutrients to the cells, to carry waste products away, to build tissue, to regulate body temperature, to aid in digestion of food, to replace daily water loss, and to sustain the health of all body cells.

Scientists think it is most likely that foods contain other important nutrients which are as yet undiscovered. This is one of the many reasons why we need to get our nourishment from food instead of from vitamin and mineral pills or supplements which contain only the nutrients we know about.





Foods are the best sources of the nutrients we need. The grocery store, the meat market, the dairy, the bakery, the garden, the frozen food locker, and the food storage cellar are the supply houses of good nutrition.

HOW MUCH?

Good nutrition must concern itself with the *amounts* as well as with *kinds* of nutrients. Neither can substitute for the other. A large quantity of one nutrient cannot make up for the lack of another nutrient. The body must have a large enough supply of each nutrient to meet all of its different needs all of the time. A reserve supply of some nutrients in the body for use during emergencies is desirable also.

Recommendations for the amounts of different nutrients needed for good nutrition are made by a group of scientists who are members of the Food and Nutrition Board of the National Academy of Sciences-National Research Council. The Board has the responsibility for interpreting the results of research and setting up *Recommended Daily Dietary Allowances*. These are the amounts of calories and certain nutrients that are needed for the maintenance of good nutrition in healthy persons in the United States. Amounts are not specified for two of the nutrients (fats and carbohydrates) because supplying enough of these need not require special care in making food choices. The allowances are higher than the least amounts required for health; they provide a margin of safety for the nutrients but not for calories. They do not cover the additional requirements associated with disease or with recovery from malnutrition.

These recommended allowances are the goals toward which to work in planning adequate diets. They are also the goals used in planning our country's food supplies.

The Recommended Daily Dietary Allowances for men, women, and children of different ages are given

RECOMMENDED DAILY DIETARY ALLOWANCES
FOOD AND NUTRITION BOARD, NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL*
DESIGNED FOR THE MAINTENANCE OF GOOD NUTRITION OF HEALTHY PERSONS IN THE UNITED STATES
(ALLOWANCES ARE INTENDED FOR PERSONS NORMALLY ACTIVE IN A TEMPERATE CLIMATE)

	Age (years)	Weight (lb.)	Height (in.)	Calo- ries	Pro- tein	Cal- cium	Iron	Vita- min A	Thia- mine	Ribo- flavin	Ascor- bic acid	Vita- min D
					gm.	gm.	mg.	I.U.	mg.	mg.	mg.	I.U.
Men	25	154	69	3200	70	0.8	10	5000	1.6	1.8	75
	45	154	69	3000	70	0.8	10	5000	1.5	1.8	75
	65	154	69	2550	70	0.8	10	5000	1.3	1.8	75
Women	25	128	64	2300	58	0.8	12	5000	1.2	1.5	70
	45	128	64	2200	58	0.8	12	5000	1.1	1.5	70
	65	128	64	1800	58	0.8	12	5000	1.0	1.5	70
	Pregnant (second half)			+300	+20	1.5	15	6000	1.3	2.0	100	400
	Lactating (28 ounces daily)			+1000	+40	2.0	15	8000	1.7	2.5	150	400
Infants (age in months)	2-6	13	24	lb. x 55	†	0.6	5	1500	0.4	0.5	30	400
	7-12	20	28	lb. x 45		0.8	7	1500	0.5	0.8	30	400
Children	1-3	27	34	1300	40	1.0	7	2000	0.7	1.0	35	400
	4-6	40	43	1700	50	1.0	8	2500	0.9	1.3	50	400
	7-9	60	51	2100	60	1.0	10	3500	1.1	1.5	60	400
	10-12	79	57	2500	70	1.2	12	4500	1.3	1.8	75	400
Boys	13-15	108	64	3100	85	1.4	15	5000	1.6	2.1	90	400
	16-19	139	69	3600	100	1.4	15	5000	1.8	2.5	100	400
Girls	13-15	108	63	2600	80	1.3	15	5000	1.3	2.0	80	400
	16-19	120	64	2400	75	1.3	15	5000	1.2	1.9	80	400

*Revised 1958.

†Recommendation not given but formulas furnishing 1.6 grams of protein per pound of body weight are in common use.

<i>Nutrient</i>	<i>Some Reasons Why We Need It</i>	<i>Foods That Supply Important Amounts</i>
PROTEIN	To build and repair all tissues in the body To help form substances called antibodies which help fight infection To supply food energy	Meat, fish, poultry, eggs Milk, cheese Breads, cereals, other grain products Dry beans, dry peas Peanut butter, nuts
FAT	To supply a large amount of food energy in a small amount of food To supply substances called essential fatty acids	Butter, margarine, cream Salad oils, oil dressings Cooking fats, oils Peanut butter Bacon, other meat fats
CARBOHYDRATE (starches and sugars)	To supply food energy To help the body use other nutrients	Grain products, including breads, cereals, flours, cornmeal, rice, macaroni, spaghetti, noodles Potatoes, sweetpotatoes, corn Dried fruits, sweetened fruits, bananas Sugar, syrup, jelly, jam, honey
CALCIUM	To help build the bones and teeth To help blood to clot To help the muscles and nerves react normally	Milk, cheese (especially cheddar-type cheese), ice cream Collards, kale, broccoli, turnip and mustard greens
IRON	To combine with protein to make hemoglobin—the red substance that carries oxygen to the cells	Meat—liver, heart, and kidney are especially good sources Poultry, eggs, shellfish Dark green leafy vegetables, peas, beans Breads, cereals, and other grain products—whole grain, enriched or restored Dried fruits

<i>Nutrient</i>	<i>Some Reasons Why We Need It</i>	<i>Foods That Supply Important Amounts</i>
VITAMIN A	To help keep the skin and the mucous membrane (linings) of the nose, mouth, and inner organs healthy and resistant to infection To protect against night blindness	Dark green and deep yellow vegetables: broccoli, chard, collards, kale, spinach, turnip greens, other dark leaves; carrots, pumpkin, sweet potatoes, winter squash Apricots, cantaloup Liver, eggs, butter, margarine, cream
THIAMINE (vitamin B ₁)	To keep the appetite and digestion normal To keep the nervous system healthy To help the body change certain substances in the food into energy for work and heat	Breads, cereals, other grain products if whole-grain, enriched, or restored Meat, especially pork, liver, heart, and kidney Poultry and eggs Milk Peas, black-eyed peas, lima beans
RIBOFLAVIN (vitamin B ₂)	To help the cells use oxygen To help keep vision clear To help keep the skin smooth and prevent scaly skin around the mouth and nose or cracking at the corners of the mouth	Milk, cheese, ice cream Meat, especially liver; poultry and eggs, fish Dark green vegetables Enriched bread, cereal products
VITAMIN C (Ascorbic acid)	To make a cementing substance that helps to hold body cells together and makes the walls of blood vessels firm To help resist infection To help in healing wounds and broken bones	Orange, grapefruit, other citrus fruits and juices, strawberries, cantaloup Tomatoes and tomato juice, green and red peppers Raw cabbage, broccoli, dark green leafy vegetables Potatoes and sweet potatoes, cooked in their jackets—especially new potatoes
VITAMIN D	To help the body absorb calcium from the digestive tract To help the body build strong bones and teeth	Milk with vitamin D added, eggs, butter Sardines, salmon, tuna Fish-liver oils

on this page. An average height and weight is given for persons in each group.

The amounts of the different nutrients in this table are in the same terms—grams, milligrams, and International Units—as are the amounts present in the foods described in the Table of Food Values. A gram (abbreviated gm.) is smaller than an ounce; there are 28.4 grams in one ounce. There are one thousand milligrams (mg.) in one gram. An *International Unit* (abbreviated I.U.) is the measure of concentration or strength for vitamins A and D.

We can be well fed and have good food habits without knowing about this table of recommended allowances. It is given here to show the scientific basis for the Daily Food Guide which we do need to know about and which will be given in the next chapter. For this Guide the allowances have been translated into servings of the different foods which contain these nutrients. A *balanced diet* is the term often used for the combination of the right amounts of the right kinds of food to provide all of the nutrients in sufficient quantities for good health.

