Unit V – Wellness, Fitness and First Aid

Chapter 4 - Nourishing Your Body

Section 1 – Nourishing Your Body

What You Will Learn to Do

Analyze how well you meet nutrient guidelines

Objectives

1. Explain the six nutrients your body requires
2. Explain the difference between simple and complex carbohydrates
3. Describe the role fat and cholesterol play in body functions
4. Compare saturated and unsaturated fats
5. Describe ways to reduce cholesterol levels
6. Compare the functions of vitamins, carbohydrates, fats and proteins
7. Identify food sources of vitamins and minerals

Key Terms

Simple Carbohydrates -	A sugar that is found in food and the body in its simple state, which supplies the body with short-term energy
Complex Carbohydrates -	A carbohydrate that is formed by the body or by plants after the conversion of simple carbohydrates, which supplies the body with long-term energy

Key Terms

Fat Soluble Vitamin -	A vitamin that is absorbed through the intestinal tract with the help of fats and is stored in the body
Monounsaturated Fats -	An oil or fat that is liquid at room temperature and is low in hydrogen, which can lower the level of blood cholesterol

Key Terms

Polyunsaturated Fats -	An oil or fatty acid containing more than one double or triple bond and is, therefore, cholesterol defensive
Saturated Fats -	A fat that does not melt at room temperature and can raise the blood cholesterol level
Amino Acids -	The basic units of proteins, produced by living cells or obtained as an essential component of a diet

Key Terms

Water Soluble Vitamin - A vitamin that is dissolved in the water of tissues

Referenced Daily Intake (RDI) - Standards developed by the US government for the regulation of vitamin and mineral requirements

Introduction

Nutrition is the science of nourishing the body properly to reach higher levels of dynamic living.

You can provide yourself with the six nutrients in a well rounded, diversified diet.

By reading labels and choosing your food carefully, you can help maintain a lean body, free from excess personal fat.

Introduction

Diets have radically changed in the last 35 years. Proper eating habits now take a back seat because of busy lifestyles and lack of time.

Other factors:

- Fast-food outlets
- Dual-career parents
- Skyrocketing number of single parent families

Introduction

There are Six Nutrients:

- Carbohydrates
- Fats
- Proteins
- Vitamins
- Minerals
- Water

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- Vitamins
- Minerals
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The first three are foodstuffs. They give us energy for body processes.

The released energy is measured in calories.

We will also look at the last three in this chapter.

Carbohydrates

Carbohydrates are found in fruits, grains and vegetables.

With a value of 4 calories per gram, they supply short- and long-term energy for everything from thinking to breathing to running a race.

Carbohydrates

Long-term Carbohydrates	Short-term Carbohydrates
Complex carbs/ starches, which are combinations of sugars	Simple carbs/sugars that are quickly absorbed
Take longer to digest and convert to glucose. Extra glucose converts to glycogen to store in muscles and liver.	Glucose (blood sugar) is the most important simple sugar, but has few nutrients. Examples: candy and soda
Extra glycogen converts to fat for long-term energy	Fruit is excellent source of simple carbs, and has vitamins and minerals as well

Carbohydrates

Grains and starchy vegetables are:

- Good sources of complex carbohydrates
- Good sources for vitamins, minerals and fiber

Fiber provides no calories but aids movement of food through the digestive system

Nourishing Your Body's Fuel with Fats

Fats (lipids) maintain body temperature, insulate body organs, provide stored energy, and carry fat-soluble vitamins (A, D, E, & K) to the cells.

One gram of fat is equivalent to 9 calories of energy, more than twice the equivalent of carbohydrates (1 gram = 4 calories).

The most sensible approach to maintaining a lean level of body fat is to _____ your fat intake.

minimize

Nourishing Your Body's Fuel with Fats

Triglycerides are the primary fats we eat and store.

- Saturated fats
  - From animals
  - Do not melt at room temperature
- Monounsaturated fats
  - Usually liquid vegetable oil
- Polyunsaturated fats
  - Usually liquid vegetable oil

Too many calories = triglycerides = fat
Too many saturated fats = cholesterol

Cardiovascular Disease is the Main Killer of Americans

Your liver already produces about 1,000 milligrams (mg) of cholesterol daily, and diet adds another 400-500 mg.

Cholesterol, a waxy, sticky substance found in human and animal waste tissue, insulates nerves and forms hormones.

Your blood carries cholesterol by way of lipoproteins, with low density lipoproteins(LDL) carrying cholesterol that is not needed by the cells in the arteries. Bad Guys!

Cardiovascular Disease is the Main Killer of Americans

Cholesterol accumulated on the inside walls of the arteries is a factor in the development of atherosclerosis.

Eventually, cardiovascular disease, in the form of a heart attack or stroke, may result.

The high density lipoproteins (HDL) carry the extra cholesterol in your blood to the liver to dispose of it, thus preventing cholesterol from building up in the arteries. For this reason, HDLs are known as the "good guys."

Cardiovascular Disease is the Main Killer of Americans

To keep cholesterol at a normal level in the body, you must lower LDL levels and raise HDL levels.

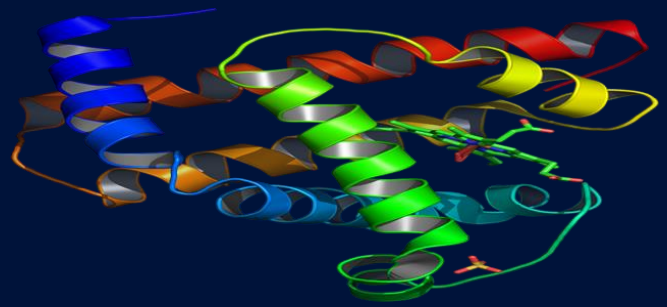
Steps you can take to accomplish this are to:

- Eat less fat (especially saturated fat)
- Maintain appropriate body weight
- Participate in a regular exercise program

Eating more fiber will also help because it binds with cholesterol and carries it out of the body. Consuming monounsaturated fats such as olive oil, canola and peanut oils, raises HDLs.

Nourishing Your Body with Proteins

Proteins:



- Are in every cell
- Aid development and
  maintenance of muscle,
  bone, skin and blood
- Keep the immune system strong
- Control chemical activities that transport oxygen, iron and nutrients
- Can be used for energy when low on carbohydrates and fat
- Have the same caloric amount as carbohydrates…
  1 gram = 4 calories

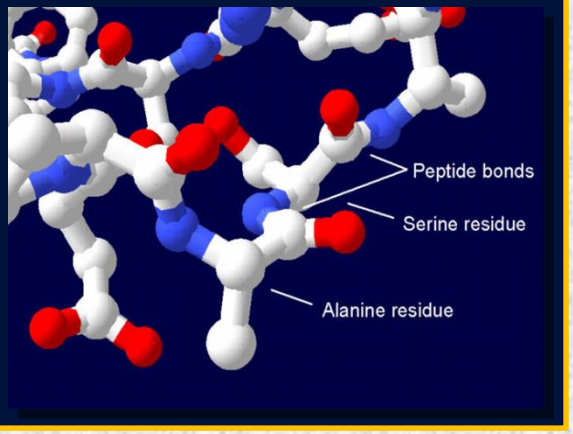
Nourishing Your Body with Proteins

The building blocks of protein are amino acids.

There are 22 amino acids found in human tissue, but the 8 (9 for children) *essential* amino acids must come from food.

Food products that contain all 8 essential amino acids are referred to as complete proteins:

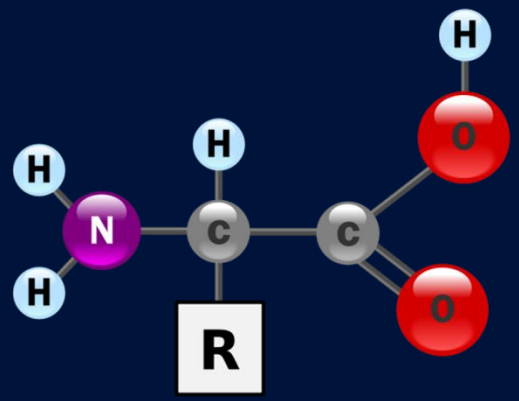
- Meat
- Fish
- Poultry
- Dairy Products



Nourishing Your Body with Proteins

Plant foods are generally incomplete since they are either low on or lack an essential amino acid.

However, when they are combined they will form complete proteins – such as the common combination of rice and beans.



The remaining 14 amino acids are the *nonessential* amino acids that are still necessary for body function, but which the body manufactures itself.

Nourishing Your Body with Proteins

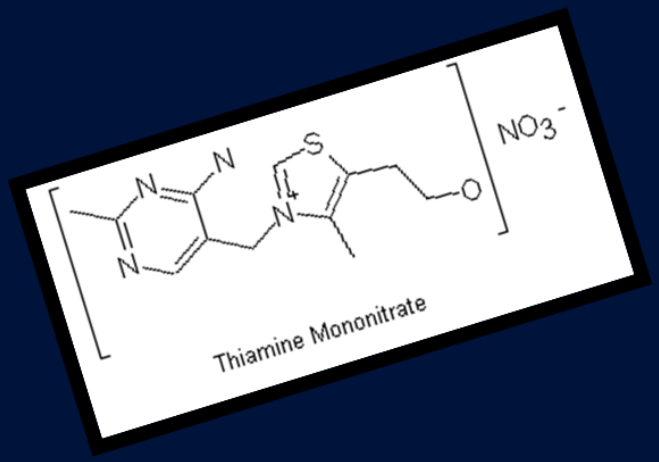
Animal and dairy products are sources of complete proteins but are also high in fat.

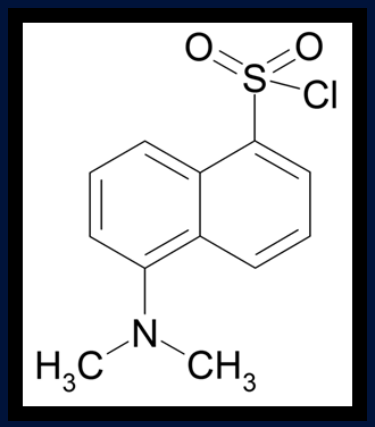
You will have a healthier diet if you meet your protein needs with carbohydrates from grains and vegetables.

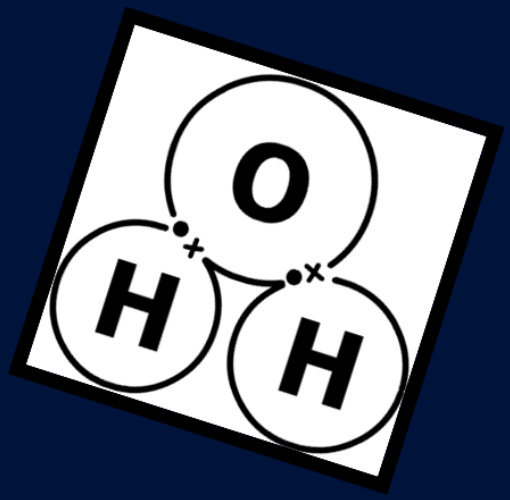
Regulating Your Body with Vitamins, Minerals and Water

Your body also needs vitamins, minerals and water to be healthy.

Vitamins and minerals come from food; water is essential for hydration.







Vitamins

Vitamins promote health and wellness.

The body does not digest vitamins like it does carbohydrates, fats and proteins; instead, the body tissues absorb them.

The intestinal tract absorbs fat-soluable vitamins: A,D, E, K.

Water in the body tissues dissolves water soluable vitamins: B complex and C.

Vitamins

Many countries have established the daily amount of vitamins and minerals needed for good health.

In the US, it is the Referenced Daily Intake (RDI), which replaced the old Recommended Dietary Allowances(RDA).

The federal government will review and update these standards as research makes new discoveries.

Vitamins

Vitamin / US RDI	Function	Sources
VITAMIN A 5000 International Units (IU)	Helps eyes, skin, and linings of the nose, mouth, digestive, and urinary tracts	Liver, dairy products, fortified margarine, orange fruits and vegetables, and dark green vegetables
VITAMIN B1/ Thamine 1.5 mg	Helps convert carbohydrates into energy	Yeast, rice, whole-grain and enriched breads/cereals, liver, pork, meat, poultry, eggs, fish, fruits, and vegetables

Vitamins

Vitamin / US RDI	Function	Sources
VITAMIN B2/ Riboflavin 1.7 mg	Helps convert nutrients into energy; helps maintain skin, mucous membranes and nervous structures	Dairy products, liver, yeast, fruits, whole-grain and enriched breads/cereals, vegetables, meat and poultry
VITAMIN B3/ Niacin 20 mg	Helps convert nutrients into energy; essential for growth; aids in synthesis of hormones	Liver, poultry, fish, milk, eggs, whole-grain and enriched breads/cereals, fruits and vegetables
VITAMIN B5/ Pantothenic Acid 10 mg	Helps convert nutrients into energy	Liver, yeast, whole grains, eggs, beans and milk

Vitamins

Vitamin / US RDI	Function	Sources
VITAMIN B6/ Pyridoxine 2.0 mg	Aids in more than 60 enzyme reactions	Milk, liver, meat, green leafy vegetables and whole-grain and enriched breads/cereals
VITAMIN B7/ Biotin 0.3 mg	Helps convert nutrients into energy	Liver, yeast, milk, oatmeal, beans, nuts and egg yolks
VITAMIN B9/ Folic Acid 0.4 mg	Aids in blood cell production; helps maintain nervous system	Liver, green leafy vegetables and beans

Vitamins

Vitamin / US RDI	Function	Sources
VITAMIN B12/ Cobalmin 6 micrograms (mcg)	Helps form new cells	Meat, seafood, poultry, dairy products and eggs
VITAMIN C 60 mg	Helps maintain and repair connective tissue, bones, teeth and cartilage; promotes wound healing	Broccoli, brussel sprouts, citrus fruit, tomatoes, potatoes, peppers, cabbage, as well as other fruits and vegetables

Vitamins

Vitamin / US RDI	Function	Sources
VITAMIN D 400IU	Helps regulate calcium and phosphorus metabolism; promotes calcium absorption; essential for development and maintenance of bones and teeth	Fortified milk, eggs, fish-liver oils, and sunlight on skin
VITAMIN E 30 IU	An antioxidant (prevents oxygen from interacting destructively with other substances) that helps protect cell membranes, maintain fats and Vitamin A, and increase blood flow	Green leafy vegetables, whole grains, nuts, seeds, vegetable shortening, liver, egg yolks

Vitamins

Vitamin / US RDI	Function	Sources
VITAMIN K 60-80 mcg	Helps in blood clotting	Green leafy vegetables, liver, tomatoes, egg yolks, milk

Points of Interest: Vitamins

10-year study of the effects of Vitamin C: (11,348 adults)

- Group 1: 50mg or more per day in food + 500 supplement
- Group2: 50 mg or more per day; no supplement
- Group3: less than 50mg; no supplement

Results

Men: Group 1 showed 35% lower mortality and 42% lower death from heart disease/stroke

Women: Group 1 showed 10% lower mortality and 25% lower death from heart disease/stroke

Minerals

Minerals are elements found in the environment that help regulate the body process.

The body needs minerals to absorb vitamins.

Macro-minerals are minerals needed in large amounts:

- Calcium
- Sulfur
- Sodium
- Chloride
- Phosphorus
- Magnesium
- Potassium

Minerals

Mineral / US RDI	Function	Sources
Calcium 1000 mg	Structure of bones and teeth, muscle contraction, maintenance of cell membranes, blood clotting, nerve impulse transmission, heart activity, helps convert carbohydrates into energy	Dairy products, small fish(ex, sardines) with bones, dark-green vegetables, dried beans and peas
Phosphorus 1000 mg	Structure of bones and teeth, release of energy from nutrients, formation of enzymes	Meat, poultry, fish, eggs, dried beans and peas, dairy products

Minerals

Mineral / US RDI	Function	Sources
Magnesium 400 mg	Building bones, release of energy from muscle glycogen, conduction of nerve impulse to muscle	Green leafy vegetables, nuts, soybeans, seeds, whole grains
Potassium 3500 mg*	Muscle contraction, maintenance of fluid and electrolyte balance, transmission of nerve impulse, release of energy from nutrients	Orange juice, bananas, dried fruit, meat, bran, peanut butter, potatoes, coffee, tea, cocoa
* No US RDI established - amount is estimated		

Minerals

Mineral / US RDI	Function	Sources
Sultur 140 mg*	Part of sulfur-containing amino acids; firm proteins of hair, nails, skin	Meat, wheat germ, dried beans and peas, peanuts
Chloride and Sodium(Table Salt is Sodium Chloride) No more than 2400 mg*	Regulate blood and fluids; nerve impulse transmission; heart activity; metabolic controls	Many canned soups and processed foods; pickles, soy sauce, sauerkraut, celery
* No US RDI established - amount is estimated		

Minerals

Sodium is a macromineral, but many Americans consume too much. This can contribute to high blood pressure which can lead to cardiovascular disease.

Calcium is also a macromineral, but many American consume too little, which can lead to osteoporosis.

Trace Minerals

The body also needs trace minerals in very small amounts. They are essential to proper functioning of the body.

An iron deficiency can reduce the number and size of red blood cells, causing weakness, sleepiness and headaches.

Trace Minerals

Mineral / US RDI	Function	Sources
Selenium 50-75 mcg*	Prevents breakdown of fats	Seafood, whole-grain cereals, meats, egg yolks, milk, garlic
Manganese 5 mg*	Central nervous system, normal bone structure, reproduction	Nuts, whole grains, vegetables, fruits, tea, cocoa powder
Fluoride 1.5-4 mg*	Tooth and bone formation	Drinking water in some places, seafood, tea
Molybdenum 75-250 mcg*	Part of enzymes	Legumes, cereals, liver, kidneys, dark-green vegetables

Trace Minerals

Mineral / US RDI	Function	Sources
Iron 18 mg	Formation of hemoglobin, part of respiratory enzymes	Liver, kidneys, meat, egg yolks, green leafy vegetables, dried fruit, dried beans and peas, whole-grain and enriched cereals
Copper 2 mg	Formation of red blood cells, part of respiratory enzymes	Oysters, nuts, cocoa powder, liver, kidneys, beans, corn oil, margarine
Iodine 150 mcg	Functioning of the thyroid gland and production of the thyroid hormones	Iodized salt and seafood

Trace Minerals

Mineral / US RDI	Function	Sources
Chromium 50-200 mcg*	Helps the body use carbohydrates and fats; aids in digestion of protein	Liver, nuts whole grains, Brewer's yeast, meat, mushrooms, potatoes, apples with skin, oysters
Zinc 15 mg	Part of many enzymes, essential to synthesis of DNA and RNA; metabolizes carbohydrates, fats and proteins, dispose of carbon dioxide, strengthen immune system, helps wounds heal, helps body use VitaminA	Meat, liver, eggs, poultry, seafood
* No US RDI established.. Amount is estimated recommendation for dietary intake. 150 mcg		

Points of Interest: Minerals

Study of the effects of Chromium

A study found that heart disease patients who received 150 mcg of chromium daily had a dramatic jump in HDL cholesterol, the “good stuff” that helps keep arteries clear.

Water

Your body is 60-70% water.

Most of your blood, brain and muscles are made of water, along with 20% of your bones.

Without water you would die in a few days.

To maintain body functions, you should drink 6-8 glasses per day, and even more when you exercise .

Hunger and Malnutrition

If you can obtain an abundant and varied diet, you can easily meet your nutritional needs.

However, for many people in the world, hunger is a way of life.

Poor nutrition is a serious worldwide problem.

Malnutrition

Malnutrition defined:
Any condition in which a person's nutrient consumption is inadequate or unbalanced, but usually involves consuming too little of one or more nutrients.

Malnourished people:

- Often have harm to every body system
- Often have damaged emotional well-being
- Do not have energy to perform well
- Are more susceptible to disease
- As children, grow much more slowly
- If pregnant, may deliver low birth weight babies with serious health issues

Malnutrition

There are various types of malnutrition. An especially serious one is protein-energy malnutrition, which means not enough protein or calories.

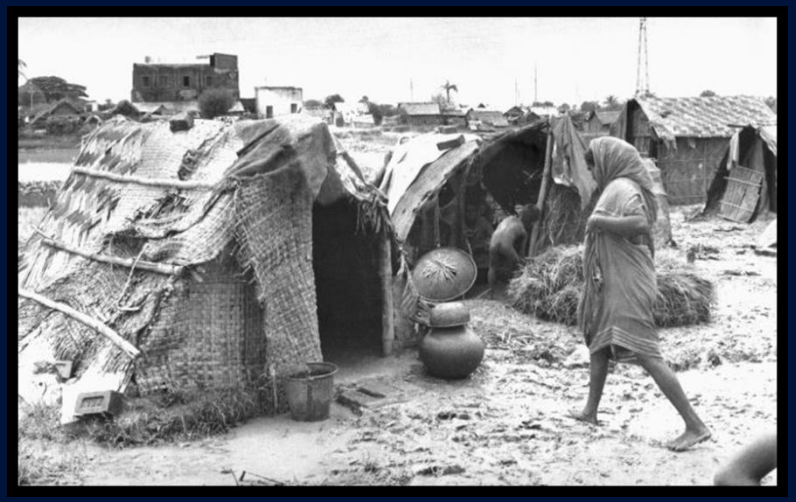
Especially severe in children, it can cause death directly or through diseases.

It is the most serious problem today in developing countries.

Malnutrition

Malnutrition has various causes (lack of knowledge, digestive system condition), but poverty is by far the most common.

People in severe poverty cannot afford to buy or grow the food they need.



A World Problem

Hunger and malnutrition are severe in many poorer nations, but they are also problems in prosperous countries.

Hungry people in the United States often include those with little or no income, such as:

- Homeless people
- Runaway teenagers
- Families with unemployment
- Some elderly people

A World Problem

Efforts to solve world hunger are going on at both international and national levels, including the United Nations.

The Food Stamp Program is one example of US Government help, as well as local efforts of ordinary people volunteering to help wherever they can.

Conclusion

Understanding your body's nutritional needs is essential to maintaining your physical and emotional health.

You may open the door to health problems without the proper balance of the six nutrients:

- Carbohydrates
- Fats
- Proteins
- Vitamins
- Mineral
- Water

Even with a fast-paced lifestyle, you can eat correctly and give your body the fuel it needs to be healthy and active.

Questions?


Which one of these
correctly identifies th
number of fat cells ar
weight adult has?
A. 20 million
B. 200 million
C. 30 billion
D. 200 billion