CHAPTER-III

An Overview of

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Nutrition (alsocalled nutrition or food) to support life (food form) material needed , to cells and organisms , of the provision . Many common health problems can be prevented or alleviated with a healthy diet .

Organism often inhuman food nutrition , meal planning , economics , and health professionals who have specialized preparation foods.Dietitians is determined by the perceived palatability , which he ate . The person ( health and disease ) , as well as institutions safe , evidence-based dietary advice and management are trained to provide . Clinical nutritionists by address nutritional deficiencies before resorting to drugs to prevent or cure chronic disease , including a special focus on the role of nutrition in the health practitioners . Government regulation of the use of the professional title " dietician " is universal for less than the field up to and including doctoral level is supported by many high- level educational programs , and its own voluntary certification board , professional associations , and peer- reviewed journals , for example . g. Nutrition , Nutrition Society of India , Association of Food Scientists and Nutritionists India , Indian Dietetic Association and the American Society of American Journal of Clinical Nutrition .

Dangerous to health conditions such as obesity and metabolic syndrome , and cardiovascular disease , diabetes , and osteoporosis , such as a poor diet, lack of common chronic diseases, systemic diseases such as scurvy andkwashiorkor reason , may have harmful effects on health .

Metabolic and physiological response of the body, nutrition, food science investigation . Molecular biology , biochemistry , nutrition, immunology , molecular medicine and genetics , with advances in the fields of nutrition, metabolism and metabolic pathways that are related to
more: biochemical sequence of steps through which substances in living things change a form.

Carnivore and herbivore diet and a diet of basic nitrogen is conflicting, with various levels of carbon. Measured in the same amount of vegetarians are less than the carbon, nitrogen, carbon consumption, while carnivores are more than nitrogen.

Compounds such as chemical or water as a human body, carbohydrates (sugar, starch, and fiber), amino acids (protein), fatty acids (in lipids), and nucleic acids (DNA and RNA) that contains. Turn consist of elements such as the compounds of carbon, hydrogen, oxygen, nitrogen, phosphorus, calcium, iron, zinc, magnesium, manganese, and so on. All of these chemical compounds and elements of the human body and the humans that eat both plant and animal life in various forms and combinations (eg hormones, vitamins, phospholipids, hydroxyapatite).

Elements and compounds in the human body, smoked digestion, absorption and digestive system of the unborn child is the system. In a typical adult the bloodstream feed. Moving through the body’s cells, seven liters of digestive juices enter the digestive tract. The digestive juice of chemical bonds, molecules in the body, and improve their conformations and energy states is broken. metabolism, is eliminated from the body with feces.
Some of the food matrix molecules into the bloodstream unchanged, are absorbed in the digestive process. Unabsorbed matter, waste products of.

The study of nutritional status, as well as the food and the dissolution of the body (in urine and faeces) away from the chemical composition of all materials as experiments before and after the state body must take into account. Food waste compared to the absorption and metabolism in the body to determine the specific compounds and elements can help. All food and waste analysis of the effects of nutrients that may be visible during the extended period. Experiments such as the number of variables involved in the science of human nutrition is still slowly evolving explains why, time-consuming and expensive, which makes the study of nutrition, are high.

In particular, the consumption of whole plant foods slows digestion and better absorption, and cell growth, maintenance, and mitosis (cell division) of a well-managed, well-regulated and essential nutrients per calorie as a result of a more favorable balance, which allows food and blood sugar. A recent study of colon cancer in men with a high risk of more frequent meals is linked, however, regularly scheduled meals (every few hours), but it has proven to be healthier than those irregular or haphazard.
Nutrient

Carbohydrates, fats, minerals, protein, vitamins, and water: the six major classes of nutrients.

These nutrient classes either macronutrients (needed in large amounts) or micronutrients (required in small quantities) can be classified as.

(Including fiber) of the macronutrients carbohydrates, fats, proteins, and water included. The micronutrients are minerals and vitamins.

The (excluding fiber and water) macronutrients structural material (amino acids from which proteins are built, and lipids in cell membranes and some signaling molecules are built) and provides energy. Some of the structural material used to generate energy internally, and in either case can be (often a little 'c' calories to separate them with a Capital C "Calories" is called and written) Joules or kilocalories is measured. Net energy from fat, however, is different, which is dependent on factors such as absorption and digestive effort, either per g 37 kJ (9 kcal). Provides energy per gram while carbohydrates and proteins is approximately 17 kJ (4 kcal), which provides a significant example is from the example. Vitamins, minerals, fiber, and water do not provide energy, but are required for other reasons. The exact cause remains unclear, however, a third class of dietary material, fiber (ie, non-digestible material such as cellulose), but, for reasons both mechanical and biochemical, are required.
Carbohydrates and fat molecules of carbon, hydrogen, and oxygen atoms are. Carbohydrates simple monosaccharides (glucose, fructose, galactose) from the complex polysaccharides (starch) range. Mixed fatty acid monomers bound to glycerol backbone of a fat are triglycerides. Some fatty acids, but all the food is needed: they can not be synthesized in the body. Protein molecules of carbon, hydrogen and oxygen and nitrogen atoms are. Proteins are fundamental components of the nitrogen that humans can not make them an inner sense of some of the necessary amino acids. Some amino acids in a process known as gluconeogenesis, glucose as the only thing, for glucose (energy cost) are convertible and can be used for energy production. Existing proteins are broken down, the various amino acids can be metabolized to carbon skeleton intermediates in cellular respiration; remaining ammonia are emitted mainly in the urine as urea. This usually occurs only during prolonged starvation.

Other micronutrients (or protection) is known to be influenced by several body systems that include antioxidants and phytochemicals. As well as the vitamins they need, for example, as in the case are not installed.

In most foods, such as various types of toxicity with other substances, some or all of the classes is a mixture of nutrients. Others may require more or less constant, while some nutrients (eg, fat-soluble vitamins) can be stored internally. Poor health due to lack of required nutrients or, in extreme cases, can be the most essential nutrients. For example, salt and water (both absolutely required) will cause illness or death of the excess.

**Carbohydrates**

Carbohydrates monosaccharides, disaccharides, or they contain a monomer (sugar) depending on the number of units can be classified as
polysaccharides. They such as rice, noodles, bread, and other grain-based products, food is a big part of the form. Monosaccharides, disaccharides, and polysaccharides, respectively, one, two, and three or more sugar units have. They usually sugar units long, multi-branch chains because often complex carbohydrates known as polysaccharides.

Traditionally, simple carbohydrates were believed to be absorbed quickly, and therefore more quickly than complex carbohydrates to increase blood glucose levels. This, however, is not accurate. Some simple carbohydrates (e.g., fructose), many complex carbohydrates are digested at essentially the same as in simple carbohydrates, glucose is the only one partial catabolism result, the various metabolic pathways (such as fructolysis) follow. Pancreatic beta cells, which are grasped by glucose in the bloodstream, stimulates the production of insulin by entering the food.

**Fiber**

Dietary fiber imperfect humans and some animals that carbohydrate is absorbed. Like all carbohydrates, when it is metabolized four calories per gram of energy (kilocalories) can produce. However, in most cases, because of its limited absorption and digestibility than. Humans do not have the enzymes necessary to disassemble it as a dietary fiber consists mainly of cellulose, a large carbohydrate polymer that is indigestible. Soluble and insoluble fiber: Subcategories of the two. Whole grains, fruits (especially plums, prunes, and figs), and vegetables, a good source of dietary fiber. A high fiber diet has many health benefits. Dietary fiber increases stool weight and size, and to alleviate the gastrointestinal problems such as diarrhea as constipation and helps reduce the possibility.
Oats, peas, beans digest move along the digestive tract of the intestine five rhythmic muscular contractions, and found in many fruits, soluble fiber slows the movement. Wheat flour, nuts and vegetables, especially insoluble fiber stimulates peristalsis in whole get food through the intestines, intestinal tract to produce a gel that dissolves in water. It can slow the absorption of sugar because these can help lower blood glucose levels. Additionally, fiber, perhaps especially from whole grains, may help reduce insulin spikes is believed, and therefore reduces the risk of type 2 diabetes. The link between increased fiber consumption and a decreased risk of colorectal cancer is still uncertain.

**Fat**

A molecule of dietary fat typically bonded to a glycerol fatty acids (carbon and hydrogen atoms consist of long chains), including. They usually triglycerides (three fatty acids attached to a glycerol backbone) as found. Fats include saturated or unsaturated fatty acids, depending on the detailed structure can be classified as. The carbon atoms of the double
bonds of unsaturated fat, saturated fatty acids, the same length so that their molecules are hydrogen atoms less than the saturated fats, all of the hydrogen atoms bonded to carbon atoms in their fatty acid chains. Unsaturated fats further classified as monounsaturated (one double bond) or polyunsaturated (many double bonds) may be. In addition, depending on the fatty acid chain of double bonds, unsaturated fatty acids omega-3 or omega-6 fatty acids are classified as. Trans fat with trans-isomer bonds are a type of unsaturated fat, the food from nature and natural resources are rare, they typically (partial) of hydrogen is produced from an industrial process. Each gram of fat has nine kilocalories. In addition to providing energy conjugated linoleic acid, catalpic acid, eleostearic punicic acid as acid and fatty acids, potent immune modulatory molecules is based on the.

Saturated fats (typically from animal sources), for millennia in many cultures around the world have been. Trans fats are to be avoided, while unsaturated fats (eg. vegetable oil), is considered to be healthy. Saturated and Unsaturated fats are usually liquid (such as olive oil or flaxseed oil) have some trans fat, at room temperature (such as butter or lard) is a particularly solid. Trans fats are very rare in nature, and to human health have been shown to be extremely effective, but such as rancidity resistance properties are useful in food processing industry.

**Essential fatty acids**

Fatty acids in the body, and always by expending energy to do so, usually from other fatty acids, may be required of them, which means that non-essential. However, in humans, at least two fatty acids are essential and must be included in the diet. Although there is a practical demonstration of the elusive essential fatty acids - omega-3 and omega-6 fatty proper balance, acid important for health - feel. The "omega" long-chain polyunsaturated fatty acids in the human body are the roles of the known eicosanoids asprostaglandins, for a class of substrates. In some
respects, are hormones. The omega-3 essential fatty acid alpha linolenic acid (ALA) in the human body, or to be taken by the marine food sources of omega-3 eicosapentaenoic acid (EPA), category 3 serves as a building block prostaglandin (PGE3 e.g. weak swelling). Arachidonic acid (AA), a building block for series 2 prostaglandins (as the United States, while the omega-6 dihomo-Gamma-linolenic acid (DGLA), series 1 prostaglandins (e.g. anti-inflammatory PGE1) serves as a building block for example. g. pro-inflammatory PGE2). In the human body, both DGLA and AA omega-6 linoleic acid (LA) can be made from, or can be taken in directly through food. Industrial society, people, especially omega-3 fatty acids relative to omega-6 fatty acids are essential fatty acids also significantly decreased, the process of vegetable oil, is used widely.

Omega-6 DGLA to AA conversion rate prostaglandins PGE1 and PGE2 production largely determines. Omega-3 EPA are anti-inflammatory PGE1 to the pro-inflammatory PGE2 (made from AA) (DGLA a) remove from the reduction in prostaglandin balance, free from membranes from AA. In addition, conversion of DGLA to AA (desaturation) in the insulin curve (up-regulated) and Glucagon (down-regulation) as the hormones are controlled by the enzyme delta-5-desaturase is controlled by. Some of the amount and type of carbohydrates consumed with amino acids, Insulin, Glucagon and other hormones may affect processes involving, therefore, the ratio of omega-6 versus omega-3 on the effects of general health, and specific effects of the immune function and inflammation, and mitosis (i.e. cell division).

**Proteins are chains of amino acids in the nutrition of the food.**

Proteins animal body (e.g. muscles, skin and hair), many of the structural material. They also form the enzymes that control chemical reactions throughout the body. Each protein molecule inclusion of nitrogen
and sometimes sulfur (these components, such as the keratin in hair, burning protein is responsible for the distinctive smell) is characterized by, which is made up of amino acids. The new body protein (protein retention) and to produce a damaged proteins (maintenance) is required to change the amino acid. No protein or amino acid storage provision, the amino acids must be present in the diet. Additional amino acids, especially urine, are discarded. All animals, some amino acids are essential (an animal can not produce them internally) and some are about twenty amino acids found in the human body (the animal can produce them from other nitrogen-containing compounds.) Is not required, and ten more, must be included in the diet, and it is necessary. Food of sufficient quantity of amino acids (which are needed in particular) is particularly important in certain situations: initial development and maturation, pregnancy, lactation, or (for example, a burn) injury, five. A complete protein source contains all the essential amino acids; Protein, essential amino acids, only one is less or more an incomplete source.

To make it a complete protein source, two incomplete protein sources (eg rice and beans) with the protein combinations are possible, and characteristic combinations are the basis of different cultural cooking traditions. However, complementary sources of protein in the body, can be used together in the same meal does not need to be eaten. Sources of dietary protein, meat, tofu and other soyPRODUCTS, eggs, beans, and dairy products are milk and cheese. Additional amino acids from protein into glucose and can be used for fuel through a process known as gluconeogenesis. Such as the conversion of the remaining amino acids are discarded.

**Minerals**

Dietary minerals are present in nearly all organic molecules of the four elements carbon, hydrogen, nitrogen and oxygen are the chemical elements required by living organisms than the other. The aim is to describe the elements of a diet low in general, because the word "mineral" is archaic. Some just as ions in the body, which is often
mentioned, including several metals are heavier than four. Some dietitians, this is the natural way in which food is provided from the recommendation, or as complex compounds, or (such as calcium carbonate from ground oyster shells), sometimes even natural inorganic source. Available resources such as some forms of ionic minerals are more easily absorbed. On the other hand, on minerals are often artificially added to the diet as supplements; most famous iodized salt to prevent goiter are iodine.

**Macrominerals**

Many factors are related to the amount, they generally "bulk minerals" is called. Some are structural, but many play a role as electrolytes recommended dietary allowance (RDA) of elements with more than 200 mg/day in alphabetical order (in the informal or folk medicine perspectives in parentheses) are:

- Calcium, a common electrolyte, but the infrastructure required (muscle and digestive system health, bone strength, and some forms neutralize acidity, may help clear toxins, nerve and membrane functions to provide the signal ions)
- Chlorine as chloride ions, the most common electrolyte, sodium, see below
- ATP and related processes necessary to process magnesium, (make bone, causes strong peristalsis, flexibility, increases alkalinity increases)
- Phosphorus bones, a necessary ingredient; necessary energy for the process.
- Potassium, a very common electrolyte (heart and nerve health)
• Sodium, a very common electrolyte; usually found in dietary supplements, foods ions are very common because of the large quantities required, though: usually sodium chloride, or common salt as a. Excessive sodium consumption leading to high blood pressure and osteoporosis, calcium and magnesium depletion can.

• Three essential amino acids and therefore many proteins (skin, hair, nails, liver, and pancreas), the sulfur is. Sulfur is a component alone, but in the form of sulfur-containing amino acids.

Trace minerals

Many factors are usually in alphabetical order in trace amounts (RDA <200 mg / day), in need of a catalyst plays a part, because they trace mineral elements enzymes. Some:

• Cobalt required for biosynthesis of vitamin B12 family of coenzymes. B is 12 biosynthesize animals and food must obtain this cobalt-containing vitamin. Cytochrome c oxidase is a required component of many redox enzymes.

• Copper,

• Chromium required for sugar metabolism

For this reason iodine is needed in large quantities than others in this list; • Iodine is only necessary for the biosynthesis of thyroxine, but probably, breast, stomach, salivary glands, thymus etc. (Extrathyroidal see iodine) as to other vital organs and sometimes classified with macrominerals

• Iron is essential for many enzymes, and for hemoglobin and some other proteins

• Manganese (processing of oxygen)
• MOLYBDENUM xanthine oxidase and related oxidases required for

• nickel present in Urease

• Selenium peroxidase (antioxidant protein) needed for

• Vanadium (Speculative: no established RDA for vanadium is the vanadium is required for some lower organisms, although no specific biochemistry works, it has been identified in humans.)

Such as carboxypeptidase, liver alcohol dehydrogenase, and carbonic anhydrase enzymes necessary for many

• Zinc

**Vitamins**

As discussed above, such as minerals, a vitamin essential nutrients needed for good health is known as the food. (Vitamin D is an exception. It in the presence of UV radiation, which can be synthesized in the skin) such as carnitine in food is recommended that a specific vitamin-like compounds, are thought useful for survival and health, but this is not "essential" food nutritional Compounds human body because they have the potential to generate. In addition, thousands of different phytochemicals recently antioxidant activity (see below) are the desirable properties may be, the food (particularly in fresh vegetables), have been discovered, however, experimental demonstration has been suggestive but inconclusive. Not classified as essential nutrients, vitamins and other essential amino acids (see above), choline, essential fatty acids (see above), and minerals are discussed in the next section.

Others.Excess levels of vitamin deficiencies among many, goitre, scurvy, osteoporosis, impaired immune system, disorders of cell metabolism, certain forms of cancer, premature aging symptoms, and
poor psychological health (including eating disorders), including disease conditions may result in some vitamin and health (notably vitamin a) are vulnerable to, and at least one vitamin B-6, is not toxic unless the level is above the required amount. Deficient or excess levels of minerals can have serious health consequences.

**Water**

Water is excreted from the body in multiple forms; urine and including feces, sweating, and six out of the water vapor in the breath. Therefore it is necessary to adequately rehydrate to replace lost fluids.

Early recommendations for the quantity of water needed to maintain good health 6-8 glasses of water daily to maintain proper hydration of the Minimum suggested. However, a person should drink eight glasses of water per day to imagine a credible scientific source that can not be found Food and Nutrition Board of the National Research Council in 1945 by the original water intake recommendation read: "An ordinary standard for each calorie of various persons, to 1 milliliter of food. This is typically the amount contained in prepared foods." well-known
recommendations on fluid intake compared to the more recent volumes of water we need to use for the good health of the public is the difference. Therefore, to help standardize guidelines, recommendations for water consumption two recent European Food Safety Authority (EFSA) documents (2010) included: (i) to have enough water or food-based dietary guidelines and (ii) Dietary Reference Prices daily intake (ADI). The specifics "of energy consumed per unit of desirable osmolarity values of urine and desirable water volumes.

"For persons with healthy hydration and adequate intakes of the state's population intakes were provided by calculations, the current EFSA guidelines recommend total water intakes for adult males, adult females and 2.5 L/day, 2.0 L/day. The reference values drinking water, other beverages, and food included. Approximately 80% of our daily water needs, with the remaining 20% coming from food, beverages we drink comes from. water content, for example, fruit and vegetables containing more than cereals with a margin varies depending on the type of food. The values we for healthy hydration, for example, the World Health Organization (have implications for the use of nutritional drinks for the Food and Agriculture Organization of the United Nations. Other guidelines published by the WHO estimated using country specific food balance sheets) added sugar Total energy intake should represent no more than 10% recommend.

The EFSA panel also determined intakes for different populations. Recommended intake volumes in the elderly as less energy consumption, however, is the same as for adults, the group reduced water requirement of renal concentrating capacity must go up. Pregnant and breastfeeding women need additional fluids to stay hydrated. The EFSA panel that pregnant women, breastfeeding women need extra, ML/day. To additional fluid output offset of 300 is equal to the volume of water as non-pregnant women, plus the high energy requirement should increase the

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amount proposed in the recommended intake values for non-lactating women and 700 mL / days.

For those who have healthy kidneys, it is somewhat difficult to drink too much water, but (especially in warm humid weather and while exercising) it is dangerous to drink too little. Overhydration are less common than dehydration, more water than it needs, it is possible that severe and fatal condition. In de drink water intoxication can occur - ionized water, especially large amounts, is hazardous.

Other nutrients

Other micronutrients include antioxidants and phytochemicals. These materials are commonly known as vitamin yet or may not be required is a more recent invention. Phytochemicals that act as antioxidants, but not all phytochemicals are antioxidants.

Antioxidants

Colorful fruits are important components of a healthy diet.

Oxygen needed as cellular metabolism / energy production potential damage ( eg mutation causing ) compounds known to the formation of radicals can asfree. Most of these are oxidizers ( ie
acceptors of electrons) and some react very strongly. Normal cellular maintenance, growth, and continued division, and these free radicals must be sufficiently neutralized by antioxidant compounds. Recently, some researchers suggested an interesting theory of evolution of dietary antioxidants. Adequate precursors (glutathione, Vitamin C) is made by, and with the body of the human body (Vitamin C in humans, Vitamin A, Vitamin K) or other compounds that production can be achieved only through direct source that can produce not the body (synthesized in the body from cholesterol by sunlight, vitamin D into vitamin A. beta-carotene).

Phytochemicals (section below) and their sub-group, polyphenols, antioxidants that are known to about 4,000, most of which are making. Different antioxidants are now known to work in a cooperative network. For example, the vitamin C or vitamin E by accepting the free radical free radical-containing glutathione can enable. Some antioxidants to deactivate free radicals are more effective than others. Can neutralize certain free radicals. Some (Vitamin A is fat soluble and protects fat areas, Vitamin C is water soluble and protects those areas.) May be present in certain areas of free radical development is interacting with a free radical, which is less than dangerous or more dangerous free radical, some antioxidants produce a compound of the compound. Having secured by way of a variety of byproducts antioxidants antioxidants to allow for more efficient action of free radical disable the butterfly effect.

Early studies of antioxidant supplements, health promotion may, however, benefit from a large clinical trial did not find, and can be more harmful supplements are suggested instead.

**Phytochemicals**.
Blackberries are a source of polyphenol antioxidants. Phytochemicals (Phyto Greek "plant" is) are chemical compounds that occur naturally in plants. The term usually antioxidants, for example, the biological significance is a reference to the chemicals used.

Research into the health effects of phytochemicals, but to date, based on the comparison of phytochemicals from dietary supplements, healthy foods that are believed to contain elements which are crucial in many fruits and vegetables evidence. While no one has proven health benefits are.

**Intestinal bacterial flora**

It is now a large population of gut flora in the gut of the animal is known. Humans, these among many others, such as Bacteroides, L. acidophilus and E. coli as a species are included. They are essential to digestion, but is also affected by the food we eat. Stimulating cell growth; suppress the growth of harmful bacteria, training the immune system to respond only to pathogens; producing vitamin B-12, and the preservation of gut bacteria to break in and to help in the absorption of otherwise indigestible foods, including many important functions for humans, some infectious against diseases.

**Advice and guidance**

**U.S. Government Policies**

Updated USDA food pyramid, published in 2005, recommended food consumption for humans is a general nutrition guide.

In the U.S., dietitians registered (RD) or licensed (LD) with the Commission on Dietetic Registration of the American Dietetic Association, and the only description for each respective business and professions, the title "Dietitian" are able to use state, the specific educational and experiential prerequisites for a national registration or licensure examination, respectively, and when. In California, registered dietitians
the "Business and Professions Code Section 2585-2586.8 of " must abide by. It is illegal for anyone to nutrition, including unqualified dietitians, can call. In some states such as Florida State, state licensing requirements title "nutritionist" are beginning to decline. Most governments provide guidance on nutrition, and some also follow the guidance in order to help consumers, food manufacturers and restaurants to process the mandatory disclosure / labeling requirements are imposed.

In the U.S., nutritional standards and recommendations Agriculture and U.S. Department of Health and Human Services has established jointly by the U.S. Department of. Dietary and physical activity guidelines from the USDA food pyramid four food groups, suppression, repression, which myPlate, the concept has been introduced. The USDA is currently responsible for oversight of the Senate Committee on Agriculture, Nutrition and Forestry Committee will. As shown here, the committee hearings are frequently broadcast on C-SPAN.

U.S. Department of Health and Human Services fulfills the nutritional recommendations, which provides a sample week-long menu. Canada's Food Guide is another governmental recommendation.

**Government Programs**

Federal and state government organizations, including some of the nutrition information in the U.S. to address the problem of non-primary health care settings has been working on nutrition literacy intervention:

The Family Nutrition Program (FNP) program, usually by local State Farm United States Department of Education (USDA), the Food Nutrition Service's (FNS) branch is funded by the U.S. around a free nutrition education program serving low-income adults are the program is run institutions. The FNP families to participate in the food stamp program and nutrition education, including the form of their food dollars stretch a healthy diet to help develop a series of tools.

Expanded Food and Nutrition Education Program (ENFEP) Currently, all 50 states and American Samoa, Guam, Micronesia,
Northern Marianas, Puerto Rico and the Virgin Islands that operates in a unique program. The knowledge, skills, attitudes, and behavior change necessary for nutritional foods voice over limited resources in order to help the audience, and Their personal development and well-being of the family food and nutrition are designed to contribute to the improvement.

Smart nutrition literacy organizations, the state's largest university system and the health insurance company, Louisiana Louisiana State Agricultural Center Foundation and the Blue Cross and Blue Shield to promote the initiative example is a public private partnership. Began in 2005, the program for children and their families lifelong healthy eating patterns and physically active lifestyle is encouraged. They teach children healthy eating and physical exercise or classroom activities designed to help prevent childhood obesity is an interactive educational program.

Teaching

Nutrition is taught in schools in many countries. England and Wales Personal and Social Education and Food Technology curricula nutrition, balanced diet, including teaching how to read nutrition labels on packaging that emphasizes the importance of. Many school nutrition class family and consumer science or health departments will be inside. In some American schools, students must take a particular number of FCS or Health related classes. Nutrition is offered at many schools, and the like nutrition or other health classes, a class of their own, are not included in FCS: Life Skills, Independent Living, Single Survival, New Connection, Health etc. In many Nutrition classes, students daily food groups, food pyramid, recommended allowances, calories, vitamins, minerals, nutrition, physical activity, healthy food choices, portion sizes and healthy life is to know about it.

U.S. medical schools, 1985, the U.S. National Research Council report entitled Nutrition Education Nutrition Education inadequate. Only various medical schools is, of course, concluded that 20% of schools were taught as a nutrition survey. 2006 survey found that the number had risen to 30%.
Healthy Diet

Whole plant foods diet

Once these maladies are rarely referred to as heart disease, cancer, obesity, diabetes, and generally "Western" diseases seen in developing countries. Chinas international practice areas, as reflected in other parts, "to 100-fold increase" in the animal essentially no cancer or heart disease, while in the shift from the diet, respectively, are coincident with the PLANT-based. In contrast, cancer, and the United States, including heart disease, usually in the developed world, such as diseases of affluence. Adjusted for age and exercise as vegetables, fruits and whole grains are rich in their diet, and some dairy products and meat, the Chinas major regional clusters rare these "Western" diseases suffered. [45] Some studies have shown that high doses of some of the possible causes of cancer. Arguments for and against this controversial issue.

United Healthcare / Pacificare nutrition guideline recommends a whole plant food diet, and recommends using protein as a condiment with a meal. November 2005 National Geographic cover article, entitled Secrets of living longer, but also recommends a whole plant food diet. This article appears normal life, and three people, Sardinians, Okinawans, and Adventists, is a lifestyle survey "usually kill people in other parts of the developed world, and the diseases suffered a fraction more healthy years to enjoy life." Offers in three in a set of 'best practices' to emulate amount. The rest is up to you. Common to all three groups, "fruits, vegetables, whole grains and eat."

Between 1976 and 1988 National Geographic article, 34,000 Seventh-day Adventists, "... an NIH funded study, seeds, soy milk, tomatoes, and reduce their risk of cancer and other fruits Adventists' habit has been observed that some of the 's nuts but surprisingly, consuming four servings of heart disease risk, five glasses of water, suggested the whole grain bread to eat, to drink one day a week to reduce. noted and."
French "paradox"

Although relatively rich in saturated fat, French food, French observes relatively low incidence of coronary heart disease or are contraindicated. A number of explanations have been suggested:

• Saturated fat consumption does not cause heart disease.
• Junk food and other process • Reduced consumption of carbohydrates
  • Regular consumption of red wine.
• More active lifestyles involving plenty of daily exercise, especially walking; French are much less dependent on cars than Americans.

Greater lipoprotein effects per gram than saturated fats by Americans, • Higher consumption of artificially produced trans fats have been shown.

However, the incidence of heart disease in France may have been underestimated and statistics collected by the World Health Organization from 1990-2000 show, in fact, may be similar to that of neighboring countries.
Sports nutrition Protein

Protein milkshakes, made from protein powder (center) and milk (left), are a common bodybuilding supplement.

Protein is an important part of every cell in the body. Hair and nails are mostly made of protein. Protein is used to build and repair body tissues. In addition, protein is used to make hormones and other body chemicals. Protein in the bones, muscles, cartilage, skin, and blood is an important building block.

The protein requirement for each individual physically active people need more protein to what extent and opinions about what to do, as differ. That " no additional review panel stating that 1 gram of protein per kilogram of body weight (BMI according to the formula ) - is aimed at the general healthy adult population in 2005 recommended dietary allowances (RDA), 0.8 for the intake of dietary protein provides resistance or endurance exercise caution is suggested for healthy adults ". Conversely, Di Pasquale (2008), citing recent studies, 2.2 g / kg Minimum protein strongly recommends " that wants to be the maximum for anyone involved in competitive or intense recreational sports lean body mass, but " do not want to gain weight."
**Water and salt.**

Water sports are the most important nutrients. Helps control body temperature during activity and helps with digestion of food waste products away from the body. Maintaining hydration during periods of physical exertion is key to peak performance. Drinking too much water during physical activity, anxiety, body mass (weight) and more than 2% dehydration can lead to clearly hinders athletic performance. Additional carbohydrates and protein before, during and after exercise to exhaustion as well as speed recovery time is over. The amount of work needed water, lean body mass is made, and environmental factors, especially ambient temperature and humidity are based on. Maintaining the right amount is the key.

**Carbohydrates**

During exercise, a form of sugar used by the body’s main fuel is carbohydrate glycogen, stored in the muscle. Activities during exercise longer than 90 minutes, especially when muscle glycogen reserves can be used up. Athletes to replace glycogen by consuming a diet high in carbohydrates, because the amount of glycogen stored in the body is limited, it is important. The game needs to improve energy performance, as well as improve overall strength and endurance can help.

**Nutrition literacy**

At the entrance, we at the national level the U.S. was not able to identify any specific nutrition literacy study, " to understand the essential services - healthy people 2010 and the nutritional literacy can be considered as a significant subset of an object. Below basic, basic, intermediate and proficient, Nall on a scale of 13 percent of adult Americans are proficient in health literacy is 44%, intermediate literacy is basic literacy is 29 percent and 14 percent are below basic health literacy. In this study, health literacy, education and poverty levels are higher than those of people living below the low health literacy is.

Lower Mississippi Delta residents, health and nutrition status of literacy tests Another study, 52 percent of participants, mainly because of methodological differences between studies, a high Nall and Delta
skills. While limited literacy have found it difficult to accurately compare Zoellner et al. Mississippi Delta region of the U.S. general population is different from the rate of health literacy and health literacy among adults in the Delta region to help establish the scope of the problem suggests. For example, only 12 percent of study participants was launched by the USDA My Pyramid graphic identity after two years. The study of nutrition and nutrition literacy and income levels of literacy and educational attainment found significant relationship between for a further description of the priorities of the region.

The figures, health / nutrition, lack of literacy and points around the complexities embedded in the social structure and other problems are associated with each other to reveal a degree. The problems between the food choices, lack of understanding of nutrition information and its application to individual circumstances, limited or difficult access to healthy food and cultural influence of the socio-economic constraints such as low levels of education and high poverty level, or lack of knowledge about healthy eating and living opportunities for reduction.

Links between low health literacy and health outcomes widely documented and some interventions to improve health literacy in the primary care setting, the evidence produced successful results. More In order to obtain better health outcomes for the non-specific intervention in primary care settings nutrition literacy should further our understanding.

**Malnutrition**

By an organism nutrient malnutrition, inadequate, excessive, or imbalanced consumption refers. In developing countries, malnutrition, nutritional imbalances or excessive consumption of most of the diseases are associated with.

Nutritionism excessive reliance on food science and nutrition studies, paradoxically, lead to poor nutrition and ill health can have a view. It was originally credited to György Scrinis, and has been popularized by Michael Pollan. Nutrients are invisible, because policy makers nutrition experts to advise on food choices depend on. Science of
how food affects the human body has an incomplete understanding, because Pollan argues, nutritionism today in the Western world can be blamed for a lot of food-related health problems.

**Inadequate**

Under consumption generally inadequate in relation to the maintenance of long-term access to the energy mentions that lead to poor health of an organism expends or expels.

**Excessive**

On the use of animals in general poor health and energy, leading to an organism expends or expels, in relation to obesity, long-term consumption of excess sustenance refers. The excessive hair loss, brittle nails, and irregular premenstrual cycles for women may cause.

**Unbalanced**

One or more nutrients in the diet to exclude other nutrients are present in the correct amount, the food is said to be unbalanced.

**Mental agility**

Some organizations must improve the Nutritional content to teachers, policy, and managed Foodservice worked with contractors and university level institutions, primarily from increased resources for nutrition in school cafeterias. Health and nutrition have been proven to have close links with overall educational success. Currently, American college students is less than 10% of the daily recommended five servings of fruits and vegetables to eat. Better nutrition has an impact on both cognitive and spatial memory performance has been shown, in a study with high blood sugar level that was better on certain memory tests. Compared to those who consumed caffeine free diet soda or confections, while another study, those who consumed yogurt concept works well. Nutritional deficiencies as far back as 1951, the behavior of mice have been shown
to have a negative impact on learning." Better learning performance is associated with diet induced effects on learning and memory ability of the "Nutrition - education relationship", showing the relationship between diet and learning and has application in a higher education setting. 91% of college students, only 7% of the recommended daily allowance of fruits and vegetables to eat, when they are in good health and feel.

Nutrition education is effective and workable model in a higher education setting. Encompass nutrition more "engaged " learning models that are picking up steam at all levels of the learning cycle, it is an idea.

Directly to their overall nutritional health of a student's grade point average (GPa) of the link is limited research available. Overall intellectual health is closely additional original data rather than just another correlation fallacy, is linked to a person's diet, it is necessary to prove.

**Mental disorders**

Nutritional supplement in the treatment of major depression, bipolar disorder, schizophrenia, and obsessive-compulsive disorder, the four most common mental disorders in developing countries may be suitable for. Have been studied most for mood elevation and stabilization acid and Docosahexaenoic acid or eicosapentaenoic supplements (which are all included), including, vitamin B 12, folic acid, and inositol an omega-3 fatty acids contained in fish oil are but flaxseed oil.

**Cancer**

Cancer is now common in developing countries. International Agency for Research on Cancer in the developing world, " according to one study, liver, stomach and esophagus cancers are often treated as carcinogenic food or salted preserved foods, consumption, and parasitic infections linked, were more common in the attack organs. " Lung cancer because the increase in tobacco use rates in poor countries is growing rapidly. Developing countries" - colon, rectum, breast and prostate cancer - affluence or a 'Western lifestyle ' is the cancer appears to be
associated with obesity may be due to that, exercise, diet and lack of ages"

**Metabolic Syndrome**

Several lines of evidence indicate lifestyle-induced hyperinsulinemia and a major factor in many disease states decisively reduced insulin function (ie insulin resistance) suggests. For example, hyperinsulinemia and insulin resistance, such as arterial microinjuries strong stress curve and clot formation (ie heart disease) and exaggerated cell division (ie cancer) as a variety of The chronic inflammation linked to the adverse development of abdominal obesity, are linked. Hyperinsulinemia and insulin resistance (the so-called metabolic syndrome), elevated blood sugar, elevated blood pressure, elevated blood triglycerides, and reduced HDL cholesterol are characteristic of the mixture. PGE1/PGE2 negative impact of hyperinsulinemia on prostaglandin balance may be significant.

In turn can cause type 2 diabetes, insulin resistance, obesity clearly, the state contributes. Virtually all obese and most type 2 diabetic individuals with insulin resistance. Weight and insulin resistance, a clear association between insulin resistance, although the exact (likely multifarious) causes are less clear. Importantly, appropriate exercise, more regular food intake and reducingglycemic load (see below), all the more overweight individuals (and thereby lower blood sugar in type 2 diabetes who are level) can reverse the insulin resistance has been demonstrated.

Leptina obesity advocate of hormonal and metabolic status via resistance to the hormone change, and insulin / leptina resistance and obesity aggravate one another, which can be a vicious cycle. The vicious cycle is putatively strongly insulin / leptina exciting food and energy increased due to the continuously high insulin / leptina is fueled by excitement and fat storage. Insulin and satiety signals to the hypothalamus in the brain as both leptina function normally, however, insulin / leptina resistance may reduce the symptoms and despite large
body fat stores more food will continue to be granted to allow. In addition, normal effect to maintain an appropriately high metabolic rate can reduce leptina signaling in the brain is reduced.

And how factors such as total protein intake of processed carbohydrates, fats, and carbohydrates to be saturated and trans fatty acids and low in vitamins and dietary variety / development debate is the extent to which minerals contribute to insulin resistance and leptina. Modern man-made pollution may potentially overwhelm the ability of the environment to the corresponding maintainhomeostasis in any case, a high glycemic index and processed foods into the human diet has the potential to introduce the recent explosion (which can overwhelm the body's ability to maintain the same level of health), as evidenced by the metabolic syndrome epidemic.

**Hyponatremia**

Without replenishment of sodium and potassium salts, excessive water intake, water intoxication can lead to more dangerous levels, which can lead to hyponatremia. While taking part in a water-drinking contest in a well-publicized case occurred in 2007 when Jennifer Strange died. More generally, the state long-distance endurance events (such as marathon or triathlon competition and training) is seen in the gradual mental dulling, headache, weakness, and confusion that; extreme cases, coma, convulsions, and death may result are. Primary damage to the brain caused by increased osmosis as blood salinity decreases, the swelling is. Effective fluid replacement techniques races, team sports such as soccer, and, as a person without making it too hard for water to provide water as the Camel Baks, devices meet the trainers in the water running / cycling in the Water Aid stations are included.

**Antinutrient**

Antinutrients interfere with the absorption of nutrients that are natural or synthetic compounds. Source of food and beverages commonly found in nutritional studies focus on antinutrients.
Processed foods

Since the Industrial Revolution some two hundred years ago, the food processing industry for a long time, both helping to keep food fresh and the food looks fresh state the nature of that change is many technologies search. More often last longer without becoming spoiled food technologies allow for the discovery has been made, while cooling, the primary technology used to maintain freshness.

The latter technology pasteurisation, autoclavage, drying, salting, and food, all of which appear to alter the original nutritional contents of various factors, including different. Pasteurisation and autoclavage (heating techniques), no doubt, preventing epidemics of bacterial infection is the most common food safety improvement. But the (new) food processing technologies undoubtedly some of the downfalls.

Such as milling, centrifugation, and pressing as the modern separation techniques are capable of feeding, providing flour, oil, juice and so on, and even separate fatty acids, amino acids, vitamins, minerals and concentration of specific components. Is essential, such as large-scale concentration of certain nutrients while removing other savings, nutritional content of food changes. Heating techniques, certain vitamins and phytochemicals, many heat-labile nutrients in the diet can reduce the material, and perhaps others yet to be discovered substances. Because reduced nutritional value, processed foods are often 'enriched' or some with a 'fortified' were lost during the process the most critical nutrients (usually certain vitamins). However, a high-nutrition processed foods, sugar and high GI starches, potassium/sodium, vitamins, fiber, related to both the content of the fresh food compared to the profile, and intact, unoxidized (essential) fatty acids have. In addition, processed foods often as oxidized fats and trans fatty acids are potentially harmful substances.

A dramatic example of the effect of food processing on population health of people living on polished rice, Barry-Barry is the history of epidemics. Removing the outer layer of rice by polishing it Barry-Barry, which eliminates the essential vitamin thiamine. Another example of the
United States in the late 19th century is the development of scurvy among infants. The majority of sufferers to control bacterial disease (as suggested by Pasteur) was heat-treated milk was fed or not. Pasteurisation was effective against bacteria, but it destroyed the vitamin C.

As mentioned, lifestyle and obesity-related diseases all over the world are becoming more and more prevalent. Some modern food processing technologies has contributed to a more comprehensive program for the development of a doubt. The food processing industry is a major part of modern economy, and therefore political decisions (e.g., nutritional recommendations, agricultural subsidies) are impressive in. Any known profit-based economy, health considerations are hardly a priority; effective long shelf life of food product with a cheaper trend. In general, whole, fresh foods have a relatively short shelf life and more than processed foods are less profitable to produce and sell. Thus, the customer is more expensive, but superior nutritional, whole, fresh foods, and cheap, usually nutritional quality, with a choice between the processed food is placed. Processed foods often cost more convenient (in both purchasing, storage, and in preparation), and more are available, because the nutritional quality of food consumption is increasing all over the world, with nutrition-related health complications.
Humans have evolved in the last 250,000 years as omnivorous predators. Early modern human diet significantly varied depending on the environment. On the feeding of animal products tended toward higher altitudes in the tropics of food, plants tended to be based more heavily on food. Detailed study of bone changes with the human and animal postcranial and dental remains from the Neolithic, analysis of cannibalism was also prevalent among prehistoric humans that have shown.

Agriculture such as wheat, rice, potatoes, and corn, such as bread, pasta as with everything, and corn tortillas to provide as many places throughout the world, began about 10,000 years ago. Milk and dairy products are also provided, and a sharp rise in a variety of meat and vegetable farming availability. Bulk storage led to infestation and contamination risks, the importance of food purity was recognized. Adherence to strict recipes and procedures necessary due to efficiency and reliability concerns, one often religious activity Cooking developed, and in response to demands for food purity and consistency.

**Ancient to 1900**

475 years ago, Anaxagoras of food absorbed by the human body and therefore "homeomerics" (generative components) contained, he said, suggesting the existence of nutrients. AD Around 400 BC, Hippocrates said, "Let food be your medicine and medicine your food".

A burning candle to the 16th century, scientist and artist Leonardo da Vinci is compared metabolism. In 1747, Dr. James LIND, a physician in the British navy, scurvy had been at sea for years that lime juice saved sailors, a deadly and painful bleeding disorder discovered, was the first scientific nutrition experiment. This discovery became known as British sailors, who, after forty years was ignored, "limeys." Essential vitamin C within lime juice can be recognized by scientists since 1930.

Around 1770, Antoine Lavoisier, the "father of nutrition and cosmetics", food oxidation of body heat source, citing the discovery of metabolism. In 1790, George Fordyce recognized calcium as necessary
for fowl survival. Early in the 19th century, the elements carbon, nitrogen, hydrogen and oxygen were recognized as the primary factors in the diet, and methods to measure their proportions were developed.

In 1816, François Magendie dogs fed only carbohydrates and fat lost their body protein and died in a few weeks in rats, but the dog must be fed protein-protein diet identify as component. In 1840, Justus Liebig Chemical Makeup detection of carbohydrates (sugar), fats (fatty acids) and the 1860 proteins (amino acids). Claude Bernard energy in blood glucose can be stored as fat or as glycogen that displays, body fat, carbohydrates and protein to be synthesized or discovered.

In the early 1880s, Kanehiro Takaki Japanese sailors (whose diets were almost exclusively white rice) (or local neuritis, a disease causing heart problems and paralysis), beriberi developed, but British sailors and Japanese naval officers were not observed that. To the diet of Japanese sailors prevented the disease include a variety of vegetables and meats.

In 1896, Eugene Baumann observed iodine thyroid glands. In 1897, Christiaan Eijkman also beriberi suffered the original of Java worked with. Eijkman white rice native food to feed chickens beriberi symptoms developed, but the whole fed unprocessed brown rice with the outer bran has observed while being healthy. Eijkman disease can be treated to food, basic cured by feeding them brown rice. Two decades later, nutritionists outer rice bran also known as thiamine, vitamin B1, which contains learned.

**Frederick Hopkins, vitamin researcher and Nobel laureate**

Early in the 20th century, Carl Von Voit and Max Rubner independently measured caloric energy cost of various species of animals, applying principles of physics in nutrition. In 1906, Wilcock and Hopkins amino acid tryptophan was necessary for the survival of rats. He was thought to be necessary for them to sustain the life of a special mixture of food containing all the nutrients are fed, but the rats died. The second group of rats fed with milk containing vitamins. Sir Frederick Hopkins as
organic materials essential to health, calories, protein and minerals other than "accessory food factors" are valid, but the body can not synthesize. In 1907, Stephen M. Babcock and Edwin B. Hart, a grain, which took four years to complete the experiment was conducted.

In 1912, Casimir Funk the unknown substances scurvy, beriberi, and Pellagra is stopped, because,, "amine" important and the words of the term vitamin, a vital factor in the diet has to be derived from ammonia then considered. The vitamins were studied in the first half of the 20th century.

Then unknown substance preventing scurvy and named vitamin C; 1913, Elmer McCollum first vitamins, fat soluble vitamin A, and water soluble vitamin B (now known to be a complex of several water-soluble vitamins in 1915) discovered. Lafayette Mendel and Thomas Osborne also cod liver oil can cure it with a dog, because a and b in 1919, Sir Edward Mellanby incorrectly identified rickets as a vitamin A. Vitamin A deficiency is the leading work. In 1922, Elmer McCollum destroyed the vitamin A in cod liver oil, but it is still cured rickets. Also in 1922, H.M. Evans and L.S. Until 1925, the original "food factor X" phone rat pregnancy to detect vitamin E as a bishop.

In 1925, the Heart of trace amounts of copper are necessary for the absorption of iron in the search. In 1927, Adolf Otto Reinhold Windaus he won the Nobel Prize in Chemistry in 1928, for which the vitamin D synthesized. In 1928, Albert Szent-Györgyi isolated ascorbic acid, and vitamin C by preventing scurvy in 1932 that proved to be. Synthesized in
1935, and in 1937, he won the Nobel Prize for his efforts. Szent-Györgyi simultaneously specify several citric acid cycle.

In 1930, William Cumming essential amino acids, the body cannot synthesize the necessary protein components were identified. In 1935, Underwood and Marston independently discovered the necessity of cobalt. In 1936, Eugene Floyd Dubois work and school performance are related to caloric intake showed. In 1938, Erhard Fernholz It was synthesized by Paul Karrer vitamin E in chemical structure search.

In 1940, during World War II and rationing in the United Kingdom drawn up by Elsie Widdowson and others took place in accordance with the principles of nutrition. In 1941, the proposed allowances (RDAs) were established by the National Research Council.

In 1992, the Department of Agriculture’s Food Guide Pyramid was released. In 2002, natural Justicestudy relationship between nutrition and violent behavior has been observed. In 2005, a full study of obesity can be caused by adenovirus in addition to bad nutrition.

World leaders to solve the problem of hunger and starvation in the world, is looking at genetically modified food options.

**Plant nutrition**

Plant nutrition is the study of the chemical elements that are essential for plant growth. Some of the principles that apply to plant nutrition. Some elements are directly involved in plant metabolism. However, this theory does not account for the so-called beneficial elements that clear positive effects on plant growth are not required to attend.

Can not complete its full life cycle of a plant without it Liebig Law of the Minimum is able to limit plant growth nutrients, the plant is considered an essential nutrient. There are 17 essential plant nutrients. Macronutrients:

- N = Nitrogen
Micronutrients (trace levels) include:

- Cl = Chlorine
- Fe = Iron
- B = Boron
- Mn = Manganese
- Na = Sodium
- Zn = Zinc
- Cu = Copper
- Ni = Nickel
- Mo = Molybdenum

**Macronutrients**

**Calcium**

Calcium in plant nutrient transport regulation is involved in the activation of certain plant enzymes. Calcium deficiency results in stunting.

**Nitrogen**

Nitrogen is an essential component of all proteins. Nitrogen deficiency most often results in stunted growth.
Phosphorus

Phosphorus is important in plant bioenergetics. As a component of ATP, phosphorus chemical energy during photosynthesis (ATP) is required for the conversion of light energy. Phosphorus by the phosphorylation activity of various enzymes can be used to modify, and can be used for cell signaling. Many plants can be used for the biosynthesis of ATP jaivikaanuo, because phosphorus plant growth and flower/seed formation is important.

Potassium

Potassium by a potassium ion pump opening and closing of the stomata are regulated. Stomata regulate water is important, because the leaves and increases drought tolerance potassium reduces water loss.