



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai

Accredited by NAAC-UGC with 'A++' Grade (Cycle III) &

Accredited by NBA (B.E - CSE, EEE, ECE, Mech & B.Tech.IT)

COIMBATORE-641 035, TAMIL NADU



19FTO302 - FOOD NUTRITION

What is Food:

Food, substance consisting essentially of protein, carbohydrate, fat, and other nutrients used in the body of an organism to sustain growth and vital processes and to furnish energy. The absorption and utilization of food by the body is fundamental to nutrition and is facilitated by digestion. Plants, which convert solar energy to food by photosynthesis, are the primary food source. Animals that feed on plants often serve as sources of food for other animals.

Define Nutrition

Nutrition, the assimilation by living organisms of food materials that enable them to grow, maintain themselves, and reproduce.

Food serves multiple functions in most living organisms. For example, it provides materials that are metabolized to supply the energy required for the absorption and translocation of nutrients, for the synthesis of cell materials, for movement and locomotion, for excretion of waste products, and for all other activities of the organism. Food also provides materials from which all the structural and catalytic components of the living cell can be assembled. Living organisms differ in the particular substances that they require as food, in the manner in which they synthesize food substances or obtain them from the surrounding environment, and in the functions that these substances carry out in their cells. Nevertheless, general patterns can be discerned in the nutritional process throughout the living world and in the types of nutrients that are required to sustain life. These patterns are the subject of this article. For a full discussion of the nutritional requirements of humans in particular, *see* the article nutrition, human.

Define Nutritional patterns in the living world

Living organisms can be categorized by the way in which the functions of food are carried out in their bodies. Thus, organisms such as green plants and some bacteria that need only inorganic compounds for growth can be called autotrophic organisms; and organisms, including all animals, fungi, and most bacteria, that require both inorganic and organic compounds for growth are called heterotrophic. Other classifications have been used to include various other nutritional patterns. In one scheme, organisms are classified according to the energy source they utilize. Phototrophic, or photosynthetic, organisms trap light energy and convert it to chemical energy, whereas chemoautotrophic, or chemosynthetic, organisms utilize inorganic or

form reduced coenzymes consist of inorganic compounds, the organism is said to be lithotrophic; if organic, the organism is organotrophic.

1. Define Nutrients

“Nutrients are the compounds in food that provide us with energy that facilitates repair and growth and helps to carry out different life processes.”

Not all nutrients provide energy but are necessary for some form or the other. These nutrients are divided into two categories:

- Macronutrients, which are required by the body in large amounts.
- Micronutrients, which are required by the body in small amounts.

Macronutrients provide energy to a living being for the function of the metabolic system. They provide massive energy has it is converted used to obtain energy. Macronutrients include fats, proteins, and carbohydrates. Micronutrient provides essential components for metabolism to be carried out. They also build and repair damaged tissues in order to control the body process. Micronutrients include calcium, iron, vitamins, iron, minerals and vitamin C.

Define Important Nutrients in Food

There are several nutrients that cannot be synthesized by the body and have to be taken externally through food. These are vital for the proper functioning of the body. The important nutrients and their functions include are mentioned below:



Carbohydrates

It is one of the main sources of energy for human beings. It comprises of three types of carbohydrates and they include fibre, sugar, and starch. They are usually low calories and thus help in maintaining a healthy diet.

Calcium

It is a mineral that is vital for building strong bones and teeth. In very fewer quantities it is also needed to our nerves, muscles work and heart. Sources of calcium include pudding, milk, yoghurt, tofu, canned fish, and fresh leafy green vegetables. Lack of calcium leads to a disease called Osteoporosis.

Cholesterol

It is essential for the brain, nerves, and development of cells. It plays an important role in the forming of enzymes and hormones. Foods include cheese, milk, chicken, beef, and fish.

Fats

It is one of the most important sources of calories. One gram of fat consists of 9 calories. It is almost twice of calories that we get from carbohydrates and proteins. Fat is usually found in foods that we use in cooking, as spreads on bread and it also found in snacks, pastries.

Iron

It is a constituent of our red blood cells. Its function is to carry oxygen from our lungs to organs, muscles, and cells. Food sources include spinach, soybeans and other leafy vegetables.

Protein

They are made of amino acids. We can obtain protein in foods such as nuts, lentils, beef, rice, chicken, beef etc.

Sodium

Foods like milk and fresh vegetables contain sodium. Lack of sodium might lead to high blood pressure.

Define Dietetics

An academic program that prepares students to use advanced knowledge about food and nutrition to help prevent and treat disease and maintain and promote health. It is...

- People-oriented and science-focused
- Evidence-based
- The first step toward a professional credential

Define Balanced Diet

A balanced diet is one which provides all the nutrients in required amounts and proper proportions. It can easily be achieved through a blend of the four basic food groups. The quantities of foods needed to meet the nutrient requirements vary with age, gender, physiological status and physical activity. A balanced diet should provide around 50-60% of total calories from carbohydrates, preferably from complex carbohydrates, about 10-15% from proteins and 20-30% from both visible and invisible fat.

In addition, a balanced diet should provide other non-nutrients such as dietary fibre, antioxidants and phytochemicals which bestow positive health benefits. Antioxidants such as vitamins C and E, beta-carotene, riboflavin and selenium protect the human body from free radical damage. Other phytochemicals such as polyphenols, flavones, etc., also afford protection against oxidant damage.

What are nutrient requirements and recommended dietary allowances (RDA)?

Requirements are the quantities of nutrients that healthy individuals must obtain from food to meet their physiological needs. The recommended dietary allowances (RDAs) are estimates of nutrients to be consumed daily to ensure the requirements of all individuals in a given population. The recommended level depends upon the bioavailability of nutrients from a given diet. The term bioavailability indicates what is absorbed and utilized by the body. In addition, RDA includes a margin of safety, to cover variation between individuals, dietary traditions and practices. The RDAs are suggested for physiological groups such as infants, pre-schoolers, children, adolescents, pregnant women, lactating mothers, and adult men and women, taking into account their physical activity. In fact, RDAs are suggested averages/day. However, in practice, fluctuations in intake may occur depending on the food availability and demands of the body. But, the average requirements need to be satisfied over a period of time.

Our diet must provide adequate calories, proteins and micronutrients to achieve maximum growth potential. Therefore, it is important to have appropriate diet during different stages of one's life . There may be situations where adequate amounts of nutrients may not be available through diet alone. In such high risk situations where specific nutrients are lacking, foods fortified with the limiting

Define the term Health

Health, in humans, the extent of an individual's continuing physical, emotional, mental, and social ability to cope with his or her environment.

This definition is just one of many that are possible. What constitutes "good" health in particular can vary widely. The rather fragile individual who stays "well" within the ordinary environment of his or her existence may succumb to a heart attack from heavy shovelling after a snowstorm; or a sea-level dweller may move to a new home in the mountains, where the atmosphere has a lower content of oxygen, and suffer from shortness of breath and anemia until his or her red blood cell count adjusts itself to the altitude. Thus, even by this definition, the conception of good health must involve some allowance for change in the environment.

Bad health can be defined as the presence of disease, good health as its absence—particularly the absence of continuing disease, because the person afflicted with a sudden attack of seasickness, for example, may not be thought of as having lost good health as a result of such a mishap.

Define Energy

Energy, in physics, the capacity for doing work. It may exist in potential, kinetic, thermal, electrical, chemical, nuclear, or other various forms. There are, moreover, heat and work—i.e., energy in the process of transfer from one body to another. After it has been transferred, energy is always designated according to its nature. Hence, heat transferred may become thermal energy, while work done may manifest itself in the form of mechanical energy.

Define Adequate Nutrition

To maintain an active and healthy lifestyle, one needs to consume a diet in adequate quantity to meet our body's nutritional and energy requirements. Scientific research has said that for healthy growth and development of an individual, it is necessary to take an adequate amount of at least 50 nutrients. When any of these nutrients are inadequately taken, an individual's growth and development are impaired, leading to health issues. A healthy diet reduces the risk of cancer, diabetes, heart disease, and stroke. Increased production of packaged and processed foods has changed many people's lifestyles and dietary patterns.

What Is an Adequate Diet?

An adequate diet is a diet that should meet all the nutritional and energy requirements that a person needs, and it can be of any form, such as carbohydrates, proteins, fats, etc.

The adequate level of needs is different for infants, children, girls, boys, men, and women, as per recommended dietary allowances.

Define Optimal Nutrition

Optimal nutrition refers to the intake of a well-balanced and nutrient-dense diet that meets the individual's specific nutritional needs. It is the cornerstone of a healthy lifestyle and plays a crucial role in the prevention of chronic diseases, maintenance of a healthy weight, and overall well-being. Optimal nutrition is not just about eating a sufficient amount of calories; it focuses on consuming the right nutrients in the right proportions to support the body's functions and promote optimal health.

Key Components of Optimal Nutrition


Balanced Diet: A balanced diet is the foundation of optimal nutrition. It involves consuming a variety of foods from different food groups in the right proportions. A balanced diet should include whole grains, fruits, vegetables, lean proteins, healthy fats, and low-fat dairy products. This ensures that the body receives a wide range of essential nutrients.

Macronutrient Distribution: The distribution of macronutrients in the diet is crucial for optimal nutrition. The recommended distribution is approximately 45-65% of calories from carbohydrates, 20-35% from fats, and 10-35% from proteins. This ensures an adequate intake of energy, essential fatty acids, and amino acids.

Micronutrient Adequacy: A diet that is rich in vitamins and minerals is essential for optimal nutrition. Including a variety of colorful fruits and vegetables, whole grains, and lean proteins can help ensure an adequate intake of essential micronutrients. Additionally, fortified foods and supplements can be used to fill any nutrient gaps.

Malnutrition

Malnutrition, physical condition resulting either from a faulty or inadequate diet (i.e., a diet that does not supply normal quantities of all nutrients) or from a physical inability to absorb or metabolize nutrients.



Malnutrition may be the result of several conditions. First, sufficient and proper food may not be available, because of inadequate agricultural processes, imperfect distribution of food, or certain social problems such as poverty or alcoholism. In these instances, the cause of malnutrition is most often found to be a diet quantitatively inadequate in calories or protein.

Malnutrition may also result when certain foods containing one or more of the essential vitamins or minerals are not included in the diet. This commonly leads to specific nutritional deficiency diseases. Aging, sickness, and other factors that contribute to poor appetite can result in inadequate food consumption. Likewise, poor eating habits and food preferences may lead to malnutrition through the habitual consumption of certain foods to the exclusion of others or of large quantities of nonnutritious foods. In certain parts of Africa, for example, the practice of weaning breast-fed infants to a diet consisting chiefly of one kind of starchy food, such as cassava, may lead to protein deficiency (*see* kwashiorkor). In parts of East Asia, a restricted selection of foods and a preference for white polished rice as a dietary staple has led to the prevalence of a deficiency of thiamin (vitamin B₁), which is found mainly in the germ and bran of grain (*see* beriberi). Multiple deficiencies are more likely to occur than single deficiencies, though the manifestations of one type usually predominate.

Role of metabolic defects

Malnutrition can also arise from acquired or inherited metabolic defects, notably those involving the digestive tract, liver, kidney, and red blood cells. These defects cause malnutrition by preventing the proper digestion, absorption, and metabolism of foodstuffs by organs and tissues.

Symptoms and treatment

Symptoms of malnutrition typically are self-apparent, with affected individuals commonly exhibiting weight loss, fatigue, and muscle weakness. Decreased immune function, dry skin, tooth decay, osteoporosis, dizziness, and mental disturbances (e.g., inability to concentrate) may also be present. Children who experience malnutrition over a prolonged period tend to be chronically underweight and may not develop normally, resulting in long-term consequences such as short stature.

Treatment for malnutrition depends on the cause. Food or meal delivery services may be used to ensure access to food, particularly in the case of elderly individuals. Persons who are severely affected may require hospitalization and use of a feeding tube. In many cases, however, simple dietary adjustments can readily reverse most harmful effects of malnutrition. Dietary supplements, such as vitamins and minerals, may be taken to aid recovery. Pastes or meals made from a specific combination of foods, with ingredients such as chickpeas, peanuts, bananas, and healthy oils, can greatly benefit the rehabilitation of normal gut microbial populations. Research in malnourished children has shown that such combinations of nutrients and accompanying improvements in the gut microbiome not only promote weight gain but also help restore overall metabolic function, which can impact bone growth, immunity, and other factors.

Define Under Nutrition:

Undernutrition is usually thought of as a deficiency primarily of calories (that is, overall food consumption) or of protein. Deficiencies of vitamins and deficiencies of minerals are usually considered separate disorders. However, when calories are deficient, vitamins and minerals are likely to be also. Undernutrition, which is often used interchangeably with malnutrition, is actually a type of malnutrition.

Protein-energy undernutrition (also called protein-energy malnutrition) is a severe deficiency of protein and calories that results when people do not consume enough protein and calories for a long time.

Worldwide, the most important preventive strategy is to reduce poverty and to improve nutritional education and public health measures.

Protein-energy undernutrition has three main forms:

- Marasmus
- Kwashiorkor
- Marasmic kwashiorkor

Marasmus

Marasmus is a severe deficiency of calories and protein. It tends to develop in infants and very young children. It typically results in weight loss, loss of muscle and fat, and dehydration. Breastfeeding usually protects against marasmus.

Kwashiorkor

Kwashiorkor is a severe deficiency more of protein than of calories. Kwashiorkor is less common than marasmus. The term is derived from an African word meaning “first child–second child” because a first-born child often develops kwashiorkor when the second child is born and replaces the first-born child at the mother’s breast. Because children tend to develop kwashiorkor after they are weaned, they are usually older than those who have marasmus.

Kwashiorkor tends to be confined to certain areas of the world where staple foods and foods used to wean babies are deficient in protein even though they provide enough calories as carbohydrates. Examples of such foods are yams, cassava, rice, sweet potatoes, and green bananas. However, anyone can develop kwashiorkor if their diet consists mainly of carbohydrates. People with kwashiorkor retain fluid, making them appear puffy and swollen. If kwashiorkor is severe, the abdomen may protrude.

Marasmic kwashiorkor

Marasmic kwashiorkor occurs when a child with kwashiorkor does not consume enough calories. People with this disorder retain fluid, and their muscle and fat tissue waste away.

Starvation

Starvation is the most extreme form of protein-energy undernutrition. It results from a total lack of nutrients for a long time. It usually occurs because food is unavailable (for example, during a famine), but it occasionally occurs when food is available (for example, when people fast or have anorexia nervosa).

Define Over Nutrition

Overnutrition happens when you take in more of a nutrient (or nutrients) than you need every day. While many people think malnutrition means a lack of nutrients, overconsumption is also considered malnutrition because it has negative health consequences.

Energy Overnutrition

Consuming too many calories (or energy) will cause you to gain weight over time unless you increase your physical activity. It doesn't matter if those extra calories come from macronutrients (fat, carbohydrates, or protein), because the body takes whatever it doesn't need and store it as fat.

Energy overnutrition is common in developed countries. Sometimes, people with this type of overnutrition may also experience micronutrient undernutrition if the foods they eat are high in calories but low in micronutrients.

Micronutrient Overnutrition

Micronutrient overnutrition occurs when you consume too much of a certain nutrient. It's possible to get too much of most vitamins or minerals. Usually, this happens when you take megadoses of dietary supplements. Getting too much of any micronutrient from food is rare.

Micronutrient overnutrition can cause acute poisoning, such as taking too many iron pills at once. It can also be chronic if you take large doses of a particular vitamin (such as vitamin B6) over several weeks or months.

What are Phytochemicals

Phytochemicals are non-nutrient bioactive components that are primarily responsible for scavenging toxic radicals after oxidative stress by generating antioxidants, the main cause of most chronic diseases. Fruit phytochemicals displayed high antioxidant capacities linked to lower incidence of degenerative diseases and lower mortality average in humans.

What are Prebiotics

The concept of prebiotics was initially suggested by Glenn Gibson and Marcel Roberfroid in 1995. Prebiotic was defined as “a non-digestible food element that promotes host health by selectively encouraging the growth and/or activity of one or a restricted number of beneficial bacteria in the colon.”

There are numerous varieties of prebiotics. The majority of them are a subset of carbohydrate groups and are largely oligosaccharide carbohydrates (OSCs) (OSCs).

1. Fructans

This category includes inulin, fructo-oligosaccharides, and oligofructose. Their structure consists of a linear fructose chain with $\beta(2\rightarrow1)$ linkage. Typically, they have terminal glucose units connected by $\beta(2\rightarrow1)$ linkage. Inulin has a DP of up to 60 whereas FOS has a DP of less than 10.

2. Galacto-Oligosaccharides

Galacto-oligosaccharides (GOS), the outcome of lactose extension, are divided into two subgroups: I GOS with extragalactose at C3, C4, or C6; and GOS produced from lactose via enzymatic trans-glycosylation. This reaction produces mostly a mixture of tri- to pentasaccharides including galactose in $\beta(1\rightarrow6)$, $\beta(1\rightarrow3)$, and $\beta(1\rightarrow4)$ links. This form of GOS is also known as TOS or trans-galacto-oligosaccharides. GOSs can considerably boost Bifidobacteria and Lactobacilli. Infant Bifidobacteria have demonstrated strong GOS incorporation. GOS also stimulates Enterobacteria, Bacteroidetes, and Firmicutes, but to a lesser amount than Bifidobacteria.

3. Starch and Glucose-Derived Oligosaccharides

There is a type of starch called as resistant starch that is resistant to digestion in the upper digestive tract (RS). It has been claimed that RS should be categorised as a prebiotic because it produces a high level of butyrate. Diverse Firmicutes groupings have the highest incorporation of RS. In vitro research indicated that *Ruminococcus bromii*, *Bifidobacterium adolescentis*, *Eubacterium rectale*, and *Bacteroides thetaiotaomicron* were also capable of degrading RS. In the mixed bacterial and faecal incubations, however, RS decomposition is impossible without *R. bromii*. Polydextrose is a glucose-derived oligosaccharide. It is composed of glucan with many branches and glycosidic bonds. Some data suggests that it can activate Bifidobacteria, however this has not yet been verified.

4. Other Oligosaccharides

Some oligosaccharides are derived from pectin, a polysaccharide. This oligosaccharide is referred to as pectic oligosaccharide (POS). They are based on the elongation of galacturonic acid or rhamnose (rhamnogalacturonan I). The carboxyl groups can be methyl esterified, and the structure can be acetylated at C2 or C3. The side chains are connected to various sugars (such as arabinose, galactose, and xylose) or ferulic acid. Their topologies differ considerably based on the origins of POSs.

What is Probiotics

Probiotic, any of various live microorganisms, typically bacteria or yeast, that are ingested or otherwise administered as a means of potentially aiding the prevention and treatment of certain health conditions, primarily gastrointestinal disorders. The notion that the ingestion of certain microorganisms can benefit digestion as well as immune function emerged in the early 20th century, with the work of Russian-born zoologist and microbiologist Élie Metchnikoff. Interest in probiotics surged in the early 21st century, when more became known about the human microbiome.

Some of the most commonly used probiotics are lactic-acid bacteria, namely strains of *Lactobacillus* and *Streptococcus*, which are normal components of the human microbiome and

types of probiotics include certain strains of *Bifidobacterium* bacteria and the yeast *Saccharomyces boulardii*. Often, the various probiotic microorganisms, in addition to occurring naturally in certain foods, are sold over the counter as capsules, powders, liquids, or chewable tablets.

What is carbohydrate

Carbohydrates are macronutrients and are one of the three main ways by which our body obtains its energy. They are called carbohydrates as they comprise *carbon*, *hydrogen* and *oxygen* at their chemical level. Carbohydrates are essential nutrients which include sugars, fibers and starches. They are found in grains, vegetables, fruits and in milk and other dairy products. They are the basic food groups which play an important role in a healthy life.

How starch occurred in plants

The primary function of starch is to serve as energy storage and as a carbon source for *de novo* biosynthesis of macromolecules. Starch can accumulate temporarily in the chloroplast of cells found in photosynthetic tissue. Most starch is found in the storage organs such as the endosperm of seeds or in roots and tubers.

How cellulose are made

Commercial sources of cellulose include wood pulp and cotton linters. Cotton linters are the short fibers remaining on cottonseeds after the long fibers have been removed. Cotton fibers are about 98% cellulose; while, wood is 40%–50% cellulose, 30% hemicellulose, and 20% lignin. Wood requires extensive processing to solubilize and remove the hemicellulose and lignins.

What are the food uses of galactomannans

Galactomannans such as guar gum and locust bean gum might have some therapeutic applications in treating obesity, hypercholesterolemia, gastritis, gastroduodenal ulcer, and constipation

What are healthful properties of starch

Starch and/or starch derivatives are nearly ubiquitous in food systems. Starch affects the sensory and textural properties of food. Starch is used to stabilize structure by acting as a bulking agent. Starch can function as a thickening agent for sauces and pie fillings and as a colloidal stabilizer for salad dressings. Starch is used as coating, glazing, and gel-forming agents for gum confections.

What are monosaccharides

Monosaccharides are chemically grouped into two families: aldose sugars and ketosesugars. The most common sugars are pentoses and hexoses. The most common pentose sugars are d-xylose and l-arabinose, which are both aldoses. The most common hexosesugars are d-glucose, d-galactose, d-mannose, and d-fructose. d-Glucose, d-galactose, and d-mannose are aldoses.

What are oligosaccharides

Oligosaccharides are composed of up to 20 monosaccharide units. Oligosaccharides often have colligative properties; which means that they can cause freezing point depression and boiling point elevation in food systems.

What are polysaccharide

Polysaccharides are composed of more than 20 monosaccharide units. Polysaccharides often are classified as being starch or non starch. Starch polysaccharides represent a source of energy in human beings while non starch polysaccharides generally are nondigestible and are important in maintaining intestinal health.

What are the stages of glycolysis cycle

Energy investment phase

Pay off phase

How many ATP are formed from TCA cycle

30

What are the lipids

The lipids are a heterogeneous group of compounds, including fats, oils, steroids, waxes, and related compounds, which are related more by their physical than by their chemical properties. Lipids are a class of compounds distinguished by their insolubility in water and solubility in nonpolar solvents. Lipids are important in biological systems because they form the cell membrane, a mechanical barrier that divides a cell from the external environment.

What are classification of lipids

Simple lipids

Compound lipids
Derived lipids

What is simple lipids

Simple lipids: Esters of fatty acids with various alcohols.

- Fats: Esters of fatty acids with glycerol. Oils are fats in the liquid state.
- Waxes: Esters of fatty acids with higher molecular weight monohydric alcohols.

What is compound lipids

Complex lipids: Esters of fatty acids containing groups in addition to an alcohol and a fatty acid.

- Phospholipids: Lipids containing, in addition to fatty acids and an alcohol, a phosphoric acid residue. They frequently have nitrogen containing bases and other substituents, eg, in glycerophospholipids the alcohol is glycerol and in sphingophospholipids the alcohol is sphingosine.
- Glycolipids (glycosphingolipids): Lipids containing a fatty acid, sphingosine, and carbohydrate.
- Other complex lipids: Lipids such as sulfolipids and aminolipids. Lipoproteins may also be placed in this category.

What is derived lipids

Precursor and derived lipids: These include fatty acids, glycerol, steroids, other alcohols, fatty aldehydes, and ketone bodies, hydrocarbons, lipid soluble vitamins, and hormones. Because they are uncharged, acylglycerols (glycerides), cholesterol, and cholesteryl esters are termed neutral lipids.

What are fatty acids

A fatty acid is a molecule characterized by the presence of a carboxyl group attached to a long hydrocarbon chain. Therefore these are molecules with a formula $R-COOH$ where R is a hydrocarbon chain.

What is meant by essential fatty acids

If a fatty acid can only be obtained from the diet (for humans) then the fatty acid is an essential fatty acid. Two fatty acids cannot be synthesized in the human body and are therefore essential. These are linoleic and linolenic fatty acids, which are both unsaturated.

What is saturated fatty acids

Saturated fatty acids do not have any double bonds. A fatty acid is saturated when every carbon atom in the hydrocarbon chain is bonded to as many hydrogen atoms as possible (the carbon atoms are saturated with hydrogen). Saturated fatty acids are solids at room temperature. Animal fats are a source of saturated fatty acids. In addition, fatty acids pack easily and form rigid structures (e.g., fatty acids are found in membranes).

What are unsaturated fatty acids

Unsaturated fatty acids can have one or more double bonds along its hydrocarbon chain. A fatty acid with one double bond is called monounsaturated. If it contains two or more double bonds, we say that the fatty acid is polyunsaturated. The melting point of a fatty acid is influenced by the number of double bonds that the molecule contains and by the length of the hydrocarbon tail. The more double bonds it contains, the lower the melting point. As the length of the tail increases, the melting point increases. Plants are the source of unsaturated fatty acids.

Name the enzymes associated with digestion of lipids

Lipolysis

What are the vitamins

Vitamins are organic compounds that people need in small quantities. Vitamins are either soluble in fat or water; otherwise, they are dissolvable.

What are hormones

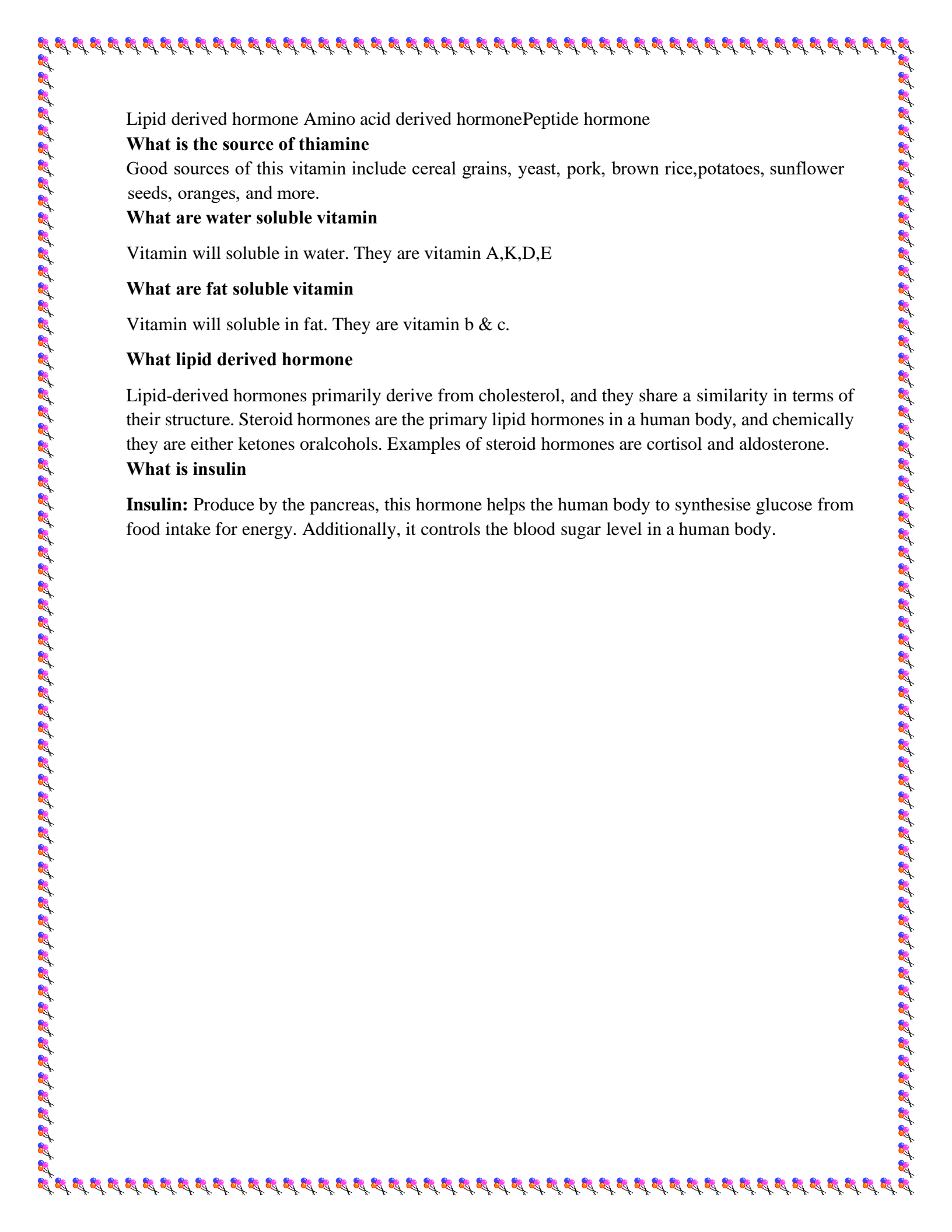
Hormones are various chemicals released within a human body that regulate and control the activities of multiple organs. The introduction of hormones to the blood takes place via endocrine glands.

What are the types of

Vitamins Two types

Water soluble Fat soluble

What are the types of hormones



Lipid derived hormone Amino acid derived hormone Peptide hormone

What is the source of thiamine

Good sources of this vitamin include cereal grains, yeast, pork, brown rice, potatoes, sunflower seeds, oranges, and more.

What are water soluble vitamin

Vitamin will soluble in water. They are vitamin A, K, D, E

What are fat soluble vitamin

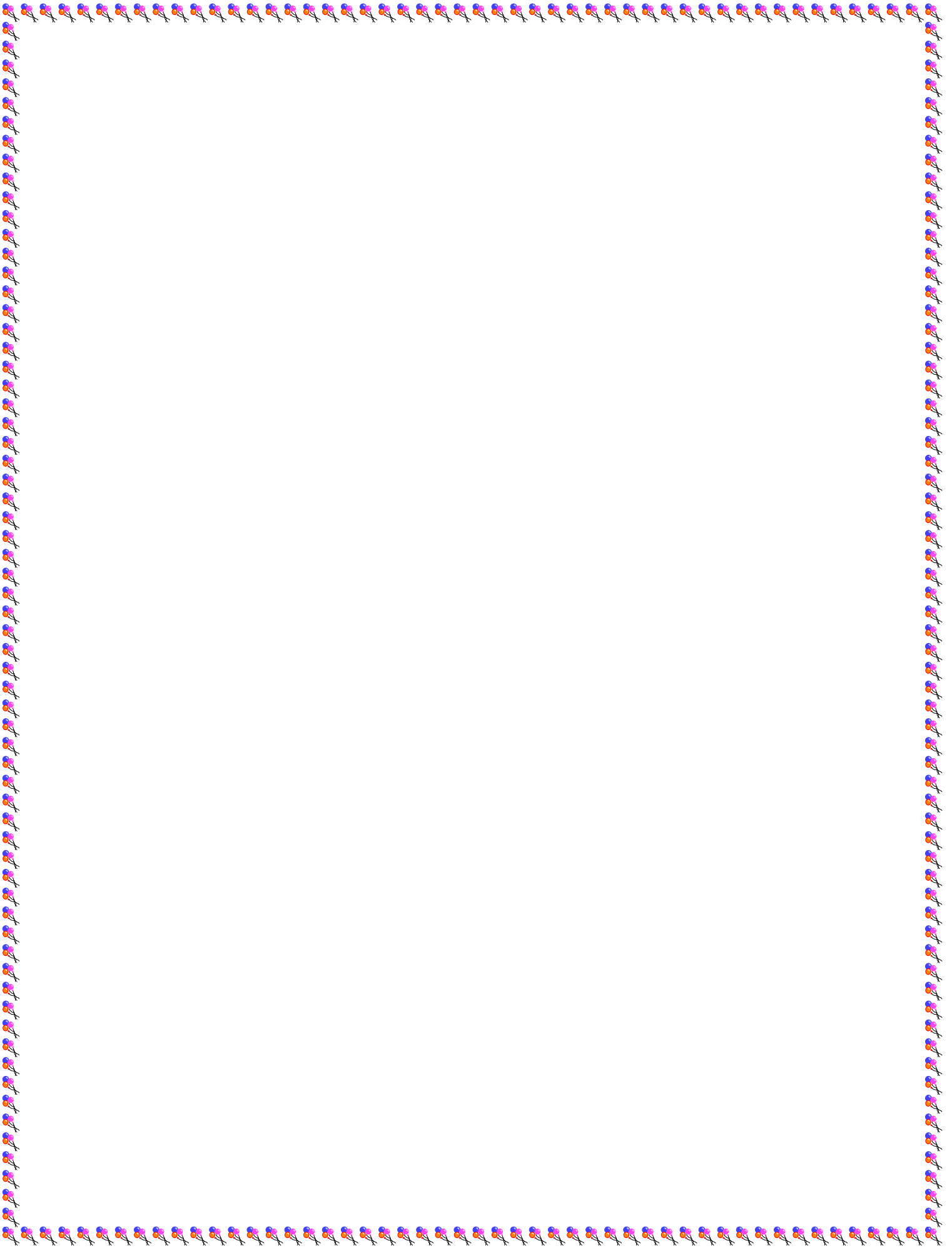
Vitamin will soluble in fat. They are vitamin b & c.

What lipid derived hormone

Lipid-derived hormones primarily derive from cholesterol, and they share a similarity in terms of their structure. Steroid hormones are the primary lipid hormones in a human body, and chemically they are either ketones or alcohols. Examples of steroid hormones are cortisol and aldosterone.

What is insulin

Insulin: Produce by the pancreas, this hormone helps the human body to synthesise glucose from food intake for energy. Additionally, it controls the blood sugar level in a human body.



What are fatty acids

A fatty acid is a molecule characterized by the presence of a carboxyl group attached to a long hydrocarbon chain. Therefore these are molecules with a formula $R-COOH$ where R is a hydrocarbon chain.

What is meant by essential fatty acids

If a fatty acid can only be obtained from the diet (for humans) then the fatty acid is an essential fatty acid. Two fatty acids cannot be synthesized in the human body and are therefore essential. These are linoleic and linolenic fatty acids, which are both unsaturated.

What is saturated fatty acids

Saturated fatty acids do not have any double bonds. A fatty acid is saturated when every carbon atom in the hydrocarbon chain is bonded to as many hydrogen atoms as possible (the carbon atoms are saturated with hydrogen). Saturated fatty acids are solids at room temperature. Animal fats are a source of saturated fatty acids. In addition, fatty acids pack easily and form rigid structures (e.g., fatty acids are found in membranes).

What are unsaturated fatty acids

Unsaturated fatty acids can have one or more double bonds along its hydrocarbon chain. A fatty acid with one double bond is called monounsaturated. If it contains two or more double bonds, we say that the fatty acid is polyunsaturated. The melting point of a fatty acid is influenced by the number of double bonds that the molecule contains and by the length of the hydrocarbon tail. The more double bonds it contains, the lower the melting point. As the length of the tail increases, the melting point increases. Plants are the source of unsaturated fatty acids .

Name the enzymes associated with digestion of lipids

Lipolysis

What are the vitamins

Vitamins are organic compounds that people need in small quantities. Vitamins are either soluble in fat or water; otherwise, they are dissolvable.

What are hormones

Hormones are various chemicals released within a human body that regulate and control the activities of multiple organs. The introduction of hormones to the blood takes place via endocrine glands.

What are the types of

vitamins

Two types
Water soluble
Fat soluble

What are the types of hormones

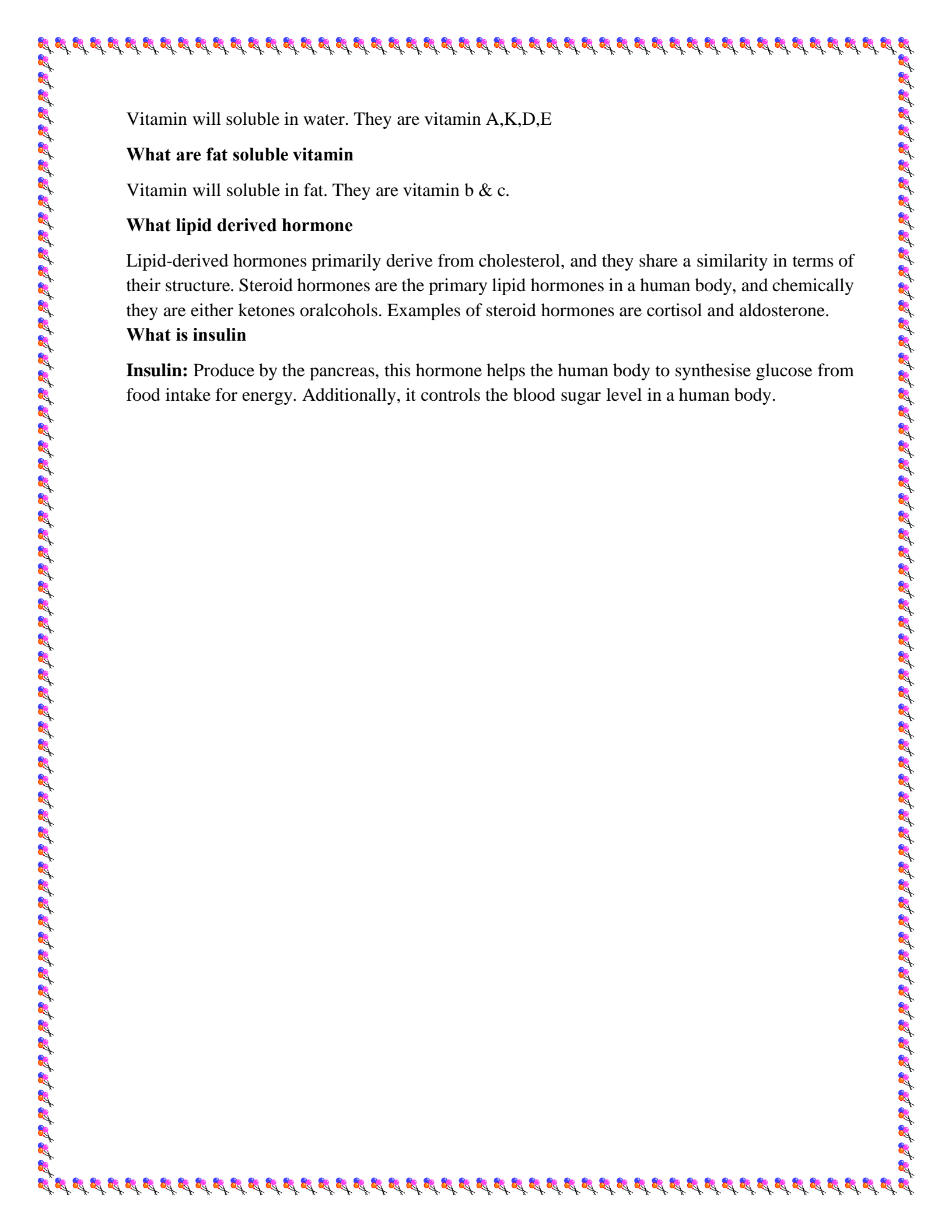
Three types

Lipid derived hormone
Amino acid derived hormone
Peptide hormone

What is the source of thiamine

Good sources of this vitamin include cereal grains, yeast, pork, brown rice, potatoes, sunflower seeds, oranges, and more.

What are water soluble vitamin



Vitamin will soluble in water. They are vitamin A,K,D,E

What are fat soluble vitamin

Vitamin will soluble in fat. They are vitamin b & c.

What lipid derived hormone

Lipid-derived hormones primarily derive from cholesterol, and they share a similarity in terms of their structure. Steroid hormones are the primary lipid hormones in a human body, and chemically they are either ketones oralcohols. Examples of steroid hormones are cortisol and aldosterone.

What is insulin

Insulin: Produce by the pancreas, this hormone helps the human body to synthesise glucose from food intake for energy. Additionally, it controls the blood sugar level in a human body.