

# The dietary requirements necessary to maintain a healthy biology essay

[Science](#), [Biology](#)



## Assignment 2 Dietary Requirements Catherine Mongie

**THE DIETARY REQUIREMENTS NECESSARY TO MAINTAIN A HEALTHY BODY**

To help maintain or improve health is to have a healthy diet. A healthy diet needs to have a balance of proteins, carbohydrates and lipids (fats). The other important nutrients are water, vitamins and minerals. The following composition will summarize the nutritional elements that our bodies need. Proteins are found in plants as well as animals and they are composed of oxygen, hydrogen, carbon, nitrogen, sulphur and iron. The most crucial ingredient is nitrogen and is in the form of amino and nucleic acids. They are large molecules which are made up of amino acid subunits and these substances are part of cells, tissues and organs. Some proteins are nutritionally essential and it cannot be made or stored within the body. The two main functions of protein are growth and repair of body tissue and metabolic for the production enzymes, hormones, antibodies, neurotransmitters and energy. It also helps maintain the volume and composition of body fluids. Proteins are macronutrients and when digested, turn into amino acids which get absorbed into the digestive system to be rebuilt by the body into its own protein. There are three main groups of amino acids, non-essential, essential and conditionally essential amino acids. Non-essential amino acids are amino acids that can be synthesized by the body. There are eight essential amino acids which cannot be made or cannot make a sufficient quantity that is needed, therefore they are supplied by a diet containing protein and the body is unable to synthesise them. They have to be ingested on a daily basis. When a non-essential amino acid becomes

an essential amino acid under special circumstances, e. g. when the body uses phenylalanine (an essential amino acid) to make tyrosine ( a non-essential amino acid), it means that the diet fails to supply enough phenylalanine or it is an inherited disease such as Phenylketonuria, the tyrosine becomes conditionally essential. About 30 years ago, protein foods, such as poultry, meat, eggs, fish and cheese were called " first class proteins" because they contained all eight essential amino acids which are needed for growth and health. Nuts, beans, lentils and beans were known as " second class proteins", and although these contained all the essential amino acids, they are in small amounts. Now they are termed as " complete" and " incomplete" protein foods. A deficiency in protein is common among people living in developing countries living an impoverished lifestyle. It also can develop with people who are born with a genetic disorder to produce certain proteins. Marasmus is one of a few deficiencies which is caused by a lack of proteins and calories. This affects infants and young children which results in wasting and dehydration which leads to starvation. People who have Marasmus appear to be skeletal with little muscle tissue. An ideal source of energy for the body is carbohydrates which are converted more readily into glucose. This form of sugar is transported within the body via the bloodstream and is used by the body. A diet high in carbohydrates can upset the delicate balance of the body's blood sugar level which results in fluctuations in energy and moods, which can be left irritated and tired. Simple and complex are two types of carbohydrates. There are many natural foods which are complex carbohydrates which are a natural starch and this can be found in bananas, lentils, nuts, potatoes, root vegetables and many

more. Simple carbohydrates are foods that are processed and contain refined sugars and these are found in white bread, sugary process breakfast cereals, etc. When carbohydrates are digested, it changes into glucose, which is transported around the body via the bloodstream. Glucose is also taken into cells and is converted into energy. Insulin which is produced in the pancreas gland is secreted which controls the uptake of glucose by the cells in our bodies. Excess glucose is converted into glycogen and this is stored in the liver or as fat around the body. The pancreas also secretes a second hormone called glucagon and this is secreted when the body needs more energy. Glucagon converts glycogen back into glucose and is released back into the bloodstream to be used by the cells in the body. So the body's sugar metabolism is a cycle of glucose insulin and glucagon reactions. Energy levels of the body are more stable and sustainable when glucose and hormones are released slowly. When carbohydrates are more refined, glucose is released faster into the bloodstream and this causes peaks and drops in the blood sugar levels, leaving less stable energy levels in the body. So the difference in complex and simple carbohydrates is that complex carbohydrates provide slower and sustainable releases of energy than simple carbohydrates. So to have long term good health, sustained energy levels and appetite control, carbohydrates should be eaten in their natural form. Although obesity is a risk for health problems, it is not a disease. Carbohydrate deficiencies can lead to weight gain and potentially obesity, a lack of carbohydrates may directly and indirectly affect ones weight. According to Greg Landry, M. S., who writes for Worldfitness. org, reports that a lack of glycogen storage results in fatigue and this can result in a

reduction of calorie expenditure which can cause weight gain. Glycogen is stored in muscle tissue and if not replaced with carbohydrates, muscles begin to atrophy (waste away of body tissue or an organ). So loss of muscle causes metabolism of the body to slow down which can affect the number of calories burned throughout the day. Lipids are a varied group of organic compounds and are large. They can dissolve in organic compounds such as acetone and alcohol, but are insoluble in water. There are two types of lipids, fats and oils (saturated fats) and liquid fats (unsaturated fats). Lipids are compounds produced by the reaction between a fatty acid and alcohol. They are an energy source which is stored for energy. Because fats conduct slowly, they are useful insulators. Fat surrounds delicate organs for protection. Saturated fats are mainly found in animal fats and dairy products. These fats are solid at room temperature. It is also found in hard margarine and is formed by the hydrogenation of vegetable oils. This is used to increase the shelf life of food which creates trans fatty acids that are harmful for health. If eaten in large amounts it can raise cholesterol levels and increases the risk of chronic diseases such as heart disease, strokes and certain cancers. Unsaturated fats are in liquid form at room temperature. These are found in vegetable sources and oily fish and cannot be manufactured by the body. This means that the body needs to get it from food. Good sources of unsaturated fats are found in avocados, unsalted nuts and seeds. Omega-3 fatty acids are found in oily fish and studies have shown that these protect against heart disease. Wolman's disease, also known as acid lipase deficiency is a severe lipid storage disease and is fatal by the age of one. It is the accumulation of cholesterol esters and

triglycerides that can build up significantly and cause damage in the cells and tissues. Babies that are born with this disease appear to be normal and active at birth, but quickly develop progressive mental deterioration, enlarged liver and spleen, distended abdomen, excessive amounts of fats in stools, jaundice, anaemia, vomiting and calcium deposits in the adrenal glands causing them to harden. Water is needed to rehydrate the body. It is needed for complicated biochemical reactions inside cells to the removal of waste products from the body. Even the smallest amount of water loss can diminish physical and mental functions. Our bodies have hundreds of metabolic activities which rely on enzymes and many of these are dependent on vitamins and minerals. Organic substances such as vitamins are obtained from food or dietary supplements. It is known up until now that there are thirteen vitamins and every one of them are needed to maintain a healthy body. To regulate our metabolism we need vitamins which we can get from food. Vitamins are also used as coenzymes to allow other chemical reactions to take place in the body. Vitamins are fat-soluble and water-soluble. Fat-soluble vitamins play a big role in the growth and maintenance of the body. There are four fat-soluble vitamins, namely A, D, E and K. Water-soluble vitamins do not provide the body with fuel for energy. Vitamin B and folic acid are considered as water-soluble vitamins and these help the body to use the fuel that has been ingested. Vitamin D is one of the most important vitamins there is. Vitamin D<sub>3</sub> is the main vitamin our bodies use and we need the sunshine to make it. It helps produce natural antibiotics and helps maintain the proper pH balance of cells and fluids in the body. Having a deficiency of vitamin D means that the body is unable to make enough and

this could be due to not getting enough sunshine or not being taken in the diet. Rickets is a deficiency that affects bone development in children and this causes bones to become soft and weak, eventually leading to bowed or curved bones. It is more common in children from Asian, African-Caribbean and Middle Eastern origins because of their skin. Minerals are inorganic substances and it is unknown how our bodies create or break down these substances. There are sixty different minerals that have been identified in the body. Twenty one of them are considered as essential and these must be supplied in food daily. They cannot be made in the body. The most common minerals are calcium, magnesium, zinc, iron and potassium. Calcium is the major mineral and this is found primarily in bones and teeth. For maximum calcium absorption, vitamin D is required. Calcium is needed to help build strong bones and teeth, regulates muscle contractions and ensuring that blood clots normally. Osteoporosis is caused by a lack of calcium in the diet. It is a degenerative bone disease that causes bone tissue to lose density. Recommended Daily Allowance is the recommended daily vitamins and mineral intake. Below is a table indicating the required intake of vitamins and minerals for men, women and children. <http://daddyblog.files.wordpress.com/2008/10/recommended-intakes.png>

Our bodies need energy to do just about anything. Without it our bodily processes cease. That is why it is important to eat a variety of foods and have a balanced diet, where the body will get all nutrients it requires. Exercise plays a vital role in keeping healthy and it is recommended that we do at least 30 minutes a day.

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