Educare: Journal Educational and Multimedia
Volume 02, Number 01, 2024
DOI 10.
2988-4969 (Online - Elektronik)

Learning Production, Formation of Internal Energy Human Body

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ABSTRACT

The body needs energy as a source of power for all activities to move, humans need a certain amount of energy that comes from food. Energy is obtained from daily food which consists of various nutrients, especially carbohydrates and fat. The energy used to carry out activities in the human body is released through the process of burning substances/food. By measuring the amount of energy released, we can find out how much food is needed to produce energy in the human body. In elementary school students it is important to understand the body's need to produce energy. This learning is included in one of the science subjects. This research method is descriptive qualitative. The aim of this research is to find out the process of energy formation in the human body and what are the benefits of energy for the human body.

Keywords:
Energy, Learning Production, Internal Energy, Human Body

INTRODUCTION

In learning, it is very necessary to learn how energy processes in the human body can be formed. Apart from simply increasing insight, it is also useful for students to fulfill the nutrition needed to fulfill the body's metabolism during the growth period. Teachers must provide direction to students to provide an understanding regarding the energy material in the human body. Teachers need to carry out strategies in studying energy in the human body. Teachers must combine learning concepts where the material is linked to everyday life, so that students will more easily understand the material. Teachers can develop learning methods by using various images of food sources that will produce energy in humans.

Humans in daily life need food for the process of forming energy in their bodies. Energy in the human body requires nutritional intake to be able to form sufficient energy to carry out activities. To form energy in the human body, adequate nutritional intake and rest are needed to get energy. Energy is the ability to do work, while work or activity can be defined as the power exerted over a certain distance. The human body really needs energy to carry out daily activities. Energy is obtained from food which consists of various nutrients, especially carbohydrates and fats through the process of burning food substances. According to the Big Indonesian Dictionary, energy is the ability to do work or can also be interpreted as the power (strength) used to carry out various activity processes. As a living creature, humans need energy to carry out their activities. For example, moving, breathing, pushing objects, and doing many other things. Humans have energy that comes from the food they eat, so food can be called an energy source. Not only humans, animals and plants also need energy to survive. Energy cannot be seen but its benefits can be felt, such as when you wash and dry clothes. To wash, you need muscle energy.

American Dietetic Association (2000), states that the need for carbohydrates, protein and fat are important nutrients for active people. The amount of carbohydrates, protein and fat needed depends on the intensity of physical exercise, time, frequency, body composition, age and gender. Carbohydrates, proteins and fats are recommended for daily physical activity. Energy is needed to support growth, development, muscle activity, other metabolic functions (maintaining

body temperature, storing body fat), repairing tissue and bone damage that can be caused by illness or injury. According to (Nurjanah 2012) sources of food energy come from carbohydrates, protein and fat. According to (Andriani and Wirjakmadi 2012) energy must be in accordance with the body's needs to prevent any disease due to metabolic disorders.

From the quote above, it can be concluded that learning about the energy formed in the human body needs to be emphasized by students. In phase B, students are expected to know how the energy process in the body can be formed, and they can apply ways to maintain this energy formation by eating healthy so that the energy in the body is always maintained, and is not affected by disease. Apart from nutritional intake or food intake , the energy formed in the human body can also be formed by rest, namely sleep. When sleeping, the human body will regain energy when it wakes up. For example, when we charge a cellphone, the cellphone will charge when the cellphone charger is plugged into electricity. The same as humans, when they sleep they feel like they are charging to get energy to carry out their activities to be more enthusiastic.

METHODS

This research method is descriptive qualitative. This type of qualitative descriptive data analysis technique is a research method that utilizes qualitative data and is described descriptively. This type of qualitative descriptive data analysis is often used to analyze social events, phenomena or situations. It is also a combination of descriptive and qualitative data analysis techniques. By carrying out a content analysis approach (content analysis). According to Weber (2005) content analysis is a research method that uses a set of procedures to make valid inferences from text. By reviewing literature from various journals and science learning books on energy material in the human body. By using this method the author can find various information related to the research carried out.

RESULTS AND DISCUSSION

Understanding Energy in the Human Body

Energy in the human body is a tool needed by the body to be able to carry out activities. Energy in the human body is formed through nutritional intake and food consumed by humans. Nutrient intake is the amount of nutrients that enter through daily food consumption to obtain energy to carry out daily physical activities (Suharjo, 1999). Lack of nutrients in the food consumed by workers will have bad consequences for the human body, such as decreased body defense against disease, reduced physical ability, decreased body weight, thin body, pale face, lack of enthusiasm, lack of motivation, slow reactions and so on. (Wisnoe, 2005). Workers' nutritional intake is obtained from the food consumed by workers every day. The food consumed by workers will undergo a digestive process in the digestive system. The food will be broken down into nutrients and then absorbed through the intestinal walls and into body fluids.

Energy is needed for other bodily functions such as digesting, processing, absorbing, as well as moving, walking, working and other activities (Soekirman 2000). physical work activities and thinking power due to the lack of nutrients received by the body so that less energy is produced (Kartasapoetra, 2008). Energy in the human body can arise due to the burning of carbohydrates, proteins and fats, so that humans always have sufficient energy, sufficient food substances are needed in their bodies. Humans who don't eat enough will have better physical strength, memory and thinking because the body receives less food substances that can produce energy.

According to (Kartasapoetra and Marsetyo 2010), in terms of food as a source of energy, it turns out that only part of food energy in the processes that occur in the body can be converted into heat. In a situation where only a little physical work is done, most of the energy is converted into heat, and in a situation where no physical work is done, relatively all of the energy is converted into heat and then the heat will leave the body. Energy consumption comes from food that is necessary to cover a person's energy expenditure if he or she has a body size and composition with an activity level that is compatible with long-term health and allows maintenance of socially and economically necessary physical activity. Apart from food intake, energy is also formed by meeting fluid needs. If the body is not filled with healthy fluids, the body

will become dehydrated so that the body will feel weak. Water is one of the building blocks of the human body. With a percentage of around 70% in the human body, water is important for survival. It is not impossible that not meeting your daily water needs will cause your body to experience problems. Maintaining body fluid levels, so that the body does not experience disturbances in digestive function and food absorption, circulation, kidneys, and is important in maintaining normal body temperature. Drinking water helps provide energy to muscles and lubricates joints to keep them flexible. Fluid imbalance can trigger muscle fatigue.

It can be concluded that energy in the human body is formed through food sources which will be broken down through the process of burning food substances so that the body will produce energy to carry out daily activities. If a body does not or rarely burns food, the body will lack energy. This lack of energy can be felt by the body, such as the body feeling weak, the eyes looking dull, and not being fit when doing activities. A body that lacks fluids is also not enough for the body to carry out the energy formation process.

Learning the Process of Energy Formation in the Human Body

In science learning, energy is needed to support growth, development, muscle activity, other metabolic functions (maintaining body temperature, storing body fat) repairing tissue and bone damage that can be caused by illness or injury. Food energy sources come from carbohydrates, protein and fat (Nurjannah, 2012). Energy must be in accordance with the body's needs to prevent disease due to metabolic disorders and to prevent accumulation of energy in the form of fat reserves in each human body (Andriani and Wirjatmadi, 2012). An imbalance between the food consumed and the needs of adolescents will cause problems of undernutrition and overnutrition (Dwiningsih, Pramono, 2013). Energy is formed through several processes in the body, namely:

1. **Protein Processing Flow in the Human Body Through the Digestive System**

Cells in the human body are only able to absorb substances in simple forms. Rephrase. Likewise, the body can only absorb protein if it is broken down into its simplest form, namely amino acids, so that it can function deep within the transportation system. The breakdown of protein in the digestive system not only affects all digestive organs, but also affects the work of several enzymes depending on the various processes that occur in the digestive system. Protein digestion in the oral cavity and esophagus. Still in the form of complex macromolecules, the process of protein digestion that occurs in the oral cavity and esophagus involves mechanical processing of food by organs such as teeth and saliva in the oral cavity. Teeth grind food, and saliva acts as a lubricant in the mouth. When food is in the mouth, the salivary glands are stimulated to produce saliva. Saliva moisturizes complex macromolecules broken down by teeth, making them semisolid and making food easier to swallow. The tongue then pushes the bolus into the esophagus. Saliva does not contain protease enzymes that break down proteins, so proteins are not or are not processed in this process. Protein digestion in the stomach. The bolus of food stored in the stomach reacts with enzymes in the stomach. One of the enzymes in the stomach is the pepsin enzyme which is obtained from gastric juice. This enzyme is only formed when stomach acid (HCL) meets protein. HCL activates pepsinogen and converts it to pepsin. Pepsin, which was originally passive, is then stimulated to become active through biochemical degradation of protein sequences. In this case, pepsin only starts the protein digestion process (Vahdatpour et al, 2016).

2. **The Relationship between the Function of Proteins from Digestion and Blood Circulation After Becoming Amino Acids.**

The human circulatory system consists of several important organs such as blood, blood vessels, and heart. Blood is an important part of the circulatory system because it is responsible for providing substances needed by all tissue cells and organs of the human body. Blood itself consists of several parts: plasma, red blood cells, white blood cells, and platelets. The majority of blood consists of plasma, which is 90% water and 10% of the following substances distributed throughout the human body: Examples: hormones, antibodies, nutrients (vitamins, glucose, amino acids, fats). , various salts (calcium, sodium, potassium, magnesium), gases (oxygen and

carbon dioxide), metabolic waste products. After the digestive process, amino acids are absorbed into the intestinal wall tissue, flowed into the capillaries, and flowed to the liver through primitive blood vessels. Postprandial amino acid levels in terrestrial blood increase more than in venous blood. Amino acids are absorbed very quickly by body cells, so that increases in plasma amino acid levels are not visible. Therefore, amino acid levels in the bloodstream do not reach high peaks (Diana, 2010).

3. The Big Role of Protein in the Human Body

Proteins play important structural and functional roles in all living cells and viruses. Most of these proteins are in the form of enzymes and/or enzyme subunits. Protein plays an important role in life because all chemical processes in the body run well with the participation of enzymes as biocatalysts. Proteins play a role in transporting and storing other molecules such as oxygen (Berg et al., 2002), such as hemoglobin in red blood cells, which acts as a binder for oxygen in the bloodstream, and is also a protein. Likewise, substances that play a role in fighting bacteria and disease and/or as immunity and antigens are proteins.

Apart from its role, protein is also needed to support growth, development, muscle formation, formation of red blood cells, defense against disease, as well as the synthesis of enzymes, hormones and even other tissues in the human body. Before protein becomes a component, it is distributed to all the necessary organs and cells, processed into amino acids in the digestive system, then processed by the body in muscles and other tissues, as mentioned previously, converted into protein. . Protein is not only a building material, but also a source of energy when the body's carbohydrate needs are not met, as previously mentioned.

4. Protein as a building block in the human body

Proteins are large biomolecules, and their function is to build biomolecules such as nucleoproteins (found in the cell nucleus and more specifically chromosomes), enzymes, hormones, antibodies, and muscle contraction. It forms new cells, replaces cells from damaged tissue, and functions as an energy source (Sumantri, 2013). Protein is a transitional form of simple amino acids into three-dimensional molecular forms that can produce various activities (Berg et al., 2002). Proteins are the building blocks of the human body because biomolecules are carbon-containing compounds that form several parts of living cells and carry out chemical reactions that allow these cells to grow, survive, reproduce and use energy storage. The most important biomolecules are nucleic acids, proteins, carbohydrates and lipids. Proteins play an active role as enzymes, transportation agents, antibodies, hormones, and membrane-forming agents.

5. Relationship between the function of proteins from digestion and blood circulation after becoming amino acids

The human circulatory system consists of several important organs such as blood, blood vessels, and heart. Blood is an important part of the circulatory system, because it is responsible for providing the necessary substances to all cells, tissues and organs of the human body. Blood itself consists of several parts: 4,444 plasma, red blood cells, white blood cells, and platelets. Most of the blood consists of plasma, which is 90% water and 10% of the following substances distributed throughout the human body: Examples: Hormones, antibodies, nutrients (vitamins, glucose, amino acids, fats), various salts (calcium, sodium, potassium, magnesium), gases (oxygen and carbon dioxide), metabolic waste products. After the digestive process, amino acids are absorbed into the intestinal wall tissue, flow into the capillaries, and flow through primitive blood vessels to the liver. Postprandial amino acid levels in terrestrial blood increase more than in venous blood. An increase in amino acid levels in plasma is not visible because amino acids are absorbed very quickly into body cells and amino acid levels in the bloodstream do not reach high peaks (Diana, 2010).

Energy Needs in the Body

A person's body's energy needs depend on several factors such as age, gender, level of physical activity, and metabolism. Energy is needed to carry out body functions such as breathing,

digestion, physical activity, and maintaining body temperature. The amount of energy required per day can vary between individuals based on these factors. Energy is needed in the body for various functions, including basal metabolism, physical activity, growth, development, muscle function, maintaining body temperature, and repairing tissue and bones damaged by illness or injury. Food energy sources come from carbohydrates, protein and fat. Chemical energy from food is converted into mechanical energy, heat energy and electrical energy in the human body. The benefits of energy for the human body include running the metabolic system, enabling various body functions, and preventing disease due to metabolic disorders. Adjusting energy to the body's needs is important to prevent disease due to metabolic disorders

Energy in the human context refers to the force or power that allows the body to function. The main purpose of energy for humans is to support daily body functions, such as growth, tissue repair, physical activity and the function of organs in the body. Energy is also needed to maintain body temperature, metabolic system, and carry out daily activities. It is important to maintain a balanced energy intake through a healthy diet and active lifestyle to support optimal body function. The formation of energy in the body requires a fairly long process if studied further. Energy is always needed by the body for power to carry out all activities. Some of the main benefits of energy for humans include:

1. Resources for Physical Activity. Energy is needed to carry out daily activities, exercise and maintain physical fitness. Without energy, humans will be hampered in carrying out their activities. The body will feel less enthusiastic about carrying out activities.
2. As body metabolism. Energy is needed to carry out metabolic processes which include burning calories, maintaining body organs, and forming new tissue.
3. Helps with growth. Energy is needed for body growth during childhood and adolescence, as well as for repairing damaged or injured tissue.
4. Brain Function. The brain needs energy to function optimally, including for thinking, concentration and other cognitive functions.
5. Regulates Body Temperature. Energy helps in maintaining stable body temperature.
6. Nutrient Transport. Energy is needed for the process of transporting nutrients and oxygen throughout the body through the blood.
7. Hormonal Balance. Energy also plays an important role in the production of hormones that regulate various functions in the body.
8. Improve the Quality of Life. Having adequate energy levels can improve the quality of life, helping a person stay active and productive.

Lack of food intake consumed by the body will also hinder the energy formation process. Lack of fluids in the body also becomes an obstacle in the formation of energy. The impacts of energy deficiency on the human body are:

1. Fatigue and Lethargy. Lack of energy can cause prolonged fatigue, making a person feel weak and without energy. If a body does not consume healthy food sources, the process of forming energy in the body will not occur, so the body will feel a lack of energy. Not only food, a body that lacks fluids will also hinder the process of forming energy in the body.
2. Decreased Concentration. Lack of energy can impair cognitive function, affecting the ability to concentrate, study, and work. A dehydrated body will not find it easy to digest thoughts into the brain.
3. Decreased body endurance. A body lacking energy may have a weak immune system, making a person susceptible to disease and infection.
4. Metabolic Disorders. Lack of energy can disrupt the body's metabolism, causing weight to decrease drastically or increase unhealthily.
5. Emotional and Mood Disorders. A lack of energy can impact a person's mood, causing feelings of stress, anxiety, or depression.
6. Digestive System Disorders. Lack of energy can affect the digestive system, causing disorders such as constipation or diarrhea.
7. Health Problems. If lack of energy continues in the long term, it can cause serious health problems such as malnutrition, hormonal disorders, or organ disorders.

Good energy balance is essential for maintaining overall health. A balanced diet, adequate rest, and regular physical activity help maintain optimal energy levels in the body. Therefore, by learning science about the formation of energy in the body, students understand and always maintain their diet before carrying out activities, because energy not only benefits the body but also the brain or cognitive system. So it is necessary for students to study the process of energy formation in the body. Humans must balance the food sources consumed with the fluids that must be put into the body for the energy formation process, so that bad things don't happen to the body.

CONCLUSION

Based on the search results, the conclusion from identifying learning about energy formation in the human body is that the body obtains energy from the food and drinks consumed daily. Energy is the ability to do work, while work or activity can be defined as the power exerted over a certain distance. Energy is produced through various processes from carbohydrates, fats and proteins in food. Carbohydrates are the main source of energy, and glucose is the main product of carbohydrate breakdown. The body converts glucose into ATP, which is the most important molecule in the body's metabolism. The energy produced is used for various activities, including physical exercise, organ function, and growth and development. The body also converts chemical energy into heat energy to maintain body temperature. The process of forming energy in the body involves various sciences, including biology, physics and chemistry. The energy produced is not constant and depends on body position, movement and environmental conditions. In science learning, energy is needed to support growth, development, muscle activity, other metabolic functions (maintaining body temperature, storing body fat) repairing tissue and bone damage that can be caused by illness or injury

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