

PROTEINS AND AMINO ACIDS

Proteins are made up of chains of amino acids. Amino acids are organic compounds that are used in the body in essential processes, and can be linked in different ways to make different proteins to be used in the body. There are 20 types of amino acids, and humans obtain some of these only through nutrition. The body cannot store amino acids, so we must obtain them from our food daily.



FEED YOUR BODY RIGHT



WHAT ARE THEY?

Carbohydrates are sugar molecules and are the body's main source of energy. They can come as simple sugars (monosaccharides and disaccharides) and complex sugars (polysaccharides). They include the sugars, starches and fibres found in vegetables, fruits, and grains, such as bread, rice and pasta.



Fiber is a type of indigestible carbohydrate. Fiber is a complex sugar (usually cellulose) that the body cannot break down into simple sugars, so it passes through the body undigested. Fiber can be soluble, so it can dissolve in water, and this can help regulate and lower blood glucose levels, as well as lower blood cholesterol level. Foods that contain soluble fiber are blueberries, apples, nuts and beans. Fiber can also be insoluble, so it cannot dissolve in water, but can help with packing the stool and prevent constipation. It also causes stool to stay in the intestine for a longer period of time, meaning all the nutrients can be absorbed.

MEAT & POULTRY

LEGUMES

FISH

EGGS&MILK

WHERE CAN I GET PROTEIN FROM?

ANIMAL PROTEIN

This includes red meat, poultry, eggs, fish and seafood. Protein from these sources contain the complete amount and variety needed by the body in order to function.

PLANT PROTEIN

This includes fruits and vegetables, such as spinach or tomatoes. Protein from these sources are for the most part incomplete, meaning they often lack at least one essential amino acid.

SUPPLEMENTAL PROTEIN

These are often protein powders from whey, soy and casein protein. It is a complete source of protein, however it is synthetic, not natural, and are not needed for a healthy diet.

WHY ARE THEY IMPORTANT?

Proteins are incredibly important in up keeping the body's function, growth and repair. In the body, proteins serve a variety of purposes. They are involved in;

- * antibodies for the immune system
- * enzymes in metabolic reactions
- * hormones and messengers
- * structural components in hair, skin and nails
- * transport proteins
- * building blocks of muscles, bones, cartilage, skin and blood



WHAT ARE LIPIDS?

Lipids are fatty acid chains, which are present in foods such as fats (which are solid at room temperature) and oils (which are liquid at room temperature). Lipids are an important part of a healthy diet, as every cell in the body uses them for their cell membrane. It is an important energy store for the body, which can also provide insulation and layered protection over vital organs.

WHY ARE THEY IMPORTANT?

Lipids can bind with a molecule called glyceride to form another molecule called triglyceride, which are stored in fat cells for energy use in the future. Lipids also make up phospholipids, which form the structure of the membrane of our cells. They are also involved in cellular communication, which helps our body function and maintain homeostasis. Additionally, stored lipids act as insulation for the body, as well as forming thin layers around vital organs such as the heart for protection.

TYPES OF LIPIDS

CIS-UNSATURATED FATS

Cis-unsaturated fats are a type of unsaturated fats, meaning they have both single and double bonded carbon molecules in their chain. The double bond leaves the hydrogen molecules on the same side, creating a bent shape in the fatty acid chain. They cannot be packed as easily in their body due to this shape, and hence are considered healthier. They can be found in plant produce and vegetable oils.

the GOOD

SATURATED FATS

Saturated fats are fatty acid chains with only single bonds between the carbon molecules. Saturated fat is considered to be less healthy than cis-unsaturated fat. Saturated fat is found in products with animal fat like red meats, butter and cheese, as well as certain vegetables like coconut oil.

the BAD

TRANS-UNSATURATED FATS

Trans-unsaturated fats are a type of unsaturated fats, but their double bond has hydrogen molecules on opposite sides, so it retains a linear shape, like saturated fat. These two fats contribute to raising cholesterol levels in the blood and cells. They are found in processed food. Currently, there is no sufficient research to determine how much trans fat is safe.

the UGLY

AMOUNTS

PORTIONS PER DAY 3 portions

TOO MUCH PROTEIN can lead to intestinal discomfort and indigestion. It is suggested that eating more than 2g per kg of bodyweight per day can cause such symptoms, as well as dehydration, unexplained exhaustion, and nausea. Constant overconsumption can lead to cardiovascular disease, liver and kidney issues, such as fatty liver, as well as seizures and death.

TOO LITTLE PROTEIN can lead to Kwashiorkor, a nutritional disorder where the body retains fluid in the body due to the excessive lack of protein in the diet. It is commonly seen in regions experiencing famine. Being protein deficient can lead to muscle wasting (reduction of muscle mass), as well as poor wound healing and being more prone to infections

HOW YOUR BODY USES PROTEIN

ESSENTIAL AMINO ACIDS

are amino acids that cannot be produced in the body. 9 of the 20 are essential, and they can all be found in animal based foods.

NON-ESSENTIAL AMINO ACIDS

are amino acids that can be produced by the body, and not needed to be obtained from the diet. 11 of the 20 amino acids are non-essential

Protein is digested by enzymes in the stomach and small intestine which break the bonds between the amino acids, making shorter chains, which can then be absorbed into the bloodstream and used by the body.



WHAT ARE THEY?

Water, also commonly known as H2O, is a key part of our body that is crucial to our life. It has many useful properties which makes it a necessity to our body - not just humans, but also most animals! Made up of one oxygen and two hydrogen atoms, this unique molecule has allowed life to form on earth.



WHAT ARE THEY?

Vitamins are building blocks that keep the body running. They are organic compounds that our body needs to ingest in small amounts to keep functioning. They are the body's builders, workers, defenders, which helps the body to build muscles and bones, make use of nutrients for energy, etc.



WHAT ARE THEY?

Minerals are a part of our world and also a part of our body. Atoms of different elements constantly carry out metabolic reactions in our body, and hence having the right amount of minerals are crucial as well.

WHAT IS THE ROLE OF WATER?

Water is an essential factor for carrying out metabolic reactions in our body. Drinking a glass of water every morning has been considered an extremely good habit for your body - not only does it wake you up, but will hydrate you as well. Essential reactions in our body all require the usage of water, and without sufficient water you will suffer from dehydration.

DEHYDRATION

arises when more water leave the body than entering to body; it usually arises from excessive sweating, as well as diarrheas and insufficient water intake. Dehydration can lead to the disruption of metabolic processes and can also be fatal if untreated for a long period of time. Signs of dehydration involves darkened urine, constipation and hardened stools. Tiredness and sleepiness can also occur as a lack of efficiency in muscle function and increased tissue exposure to metabolic waste. Blood pressures can also fall due to lowered blood volume, which increases heart rate and consequently a great risk for heart-problem related patients. Our body may lose its ability to control temperature due to its lack of ability to sweat, which can often lead to heat strokes and considered as fatal.

OVERHYDRATION

can occur when our body takes in too much water. There is no such substance that is always good for the body, and water is no exception; If our body takes in too much water respective to how much we really need, our cells can swell up and even burst in extreme cases; this can also be fatal. This usually happens when someone drinks too much water in a very short amount of time. In 2007, a woman who entered "water-drinking competition" and drank more than 7.5 litres of water under an hour was soon found dead for water intoxication.

WHAT DO VITAMINS DO?

- A - improves eyesight and strengthens bones/skin
- B1 - essential for energy storage in carbs
- B2 - essential for growth and development of cells
- B6 - essential for the synthesis of proteins and amino acids
- B12 - essential for the development of blood cells and its components
- C - prevents scurvy and strengthens gums
- D - improves bone strength by letting the body take in more calcium
- E - prevents cholesterol buildup and reduce the risk of heart disease
- K - essential for blood clotting

SOURCES OF VITAMINS

All foods are sources of vitamins, but different foods contain different vitamins. It is important to keep a balanced diet to get all aspects of vitamin to a good degree.

Fresh fruits and vegetables contain a good amount of vitamin B1, B6, C, K

Meat, fish, egg, beans, lentils contain a good amount of vitamin A, B1, B6, B12, D, E

Sunlight can also provide vitamin D to our body directly, so it is beneficial to expose yourself to sunlight for 10-15 minutes a day.

SHOULD WE TAKE SUPPLEMENTS?

Vitamin supplements should be treated as a "supplement", i.e. consumed when the intake from natural food is not enough. If you constantly have a balanced meal extra supplements are not required.

So the answer is yes/no - while supplements can help some people who have trouble getting all aspects of nutrition, most people will not need to consume it.

TOO LITTLE VITAMINS

can stop the body from functioning properly, some vitamins are critical to life if not sufficient amounts are provided. For example if vitamin K is not sufficient within one's body, they can take abnormally longer time for blood clotting which can be fatal

TOO MANY VITAMINS

can also be harmful to the body. For water-soluble vitamins (B1/2/6/12 and C), they will simply flush out of the body's excretory system (sweat, urine) without doing any more good. However for fat-soluble vitamins, they will tend to accumulate inside the body which can lead to harmful consequences. Vitamin A is known to be fatal if consumed in too much excess, and vitamin D can cause harm to liver if consumed in excess. However these side effects are unlikely to form unless you consume 50 pills of vitamin supplement a day, so do not worry too much!

- Sodium
- Potassium
- Calcium
- Phosphorus
- Iron
- Magnesium
- Chloride

WHAT DO MINERALS DO?

- Iron - element for blood production and transportation (binds with haemoglobin to make transport more efficient)
- Potassium - helps regulate fluid balance, muscle contractions and nerve signals
- Calcium - strengthens bones and teeth, as well as blood clotting and cell signalling
- Magnesium - helps to maintain normal nerve and muscle function, supports a healthy immune system, keeps the heartbeat steady
- Chloride - helps fluid levels in the body remain balanced by working closely with both sodium and potassium.
- Phosphorus - helps regulate the renal functions of the body and increase the growth of the bones
- Sodium - plays an essential role in the body by working in the Na+/K+ pump and also nerve impulse.

SOURCES OF MINERALS

Similar to vitamins, all food contain some degree of;

Fresh fruits and vegetables contain a good amount of: Iron, Potassium, Magnesium

Meat, fish, egg, beans, lentils contain a good amount of: Calcium, Chloride, Phosphorus, Sodium

Highly processed foods such as instant ramen and fried breadsticks often contain a very large amount of Sodium, but this is not very good for your health.

How much is "enough"?

Minerals are crucial to our life and hence needed to be taken by a certain amount each day. While there is no fixed rule of how much minerals should be consumed each day, many dieticians recommend that eating a healthy, balanced diet will be good enough mineral intake per day.

AMOUNTS

TOO LITTLE MINERALS

will not allow body to carry out its crucial life processes. Most processes of life such as respiration and muscle contractions require the aid of minerals of some sort - naturally if you are in mineral deficiency, you are at risk!

TOO MANY MINERALS

can cause symptoms of headache, nausea, dizziness and an upset stomach. While it is unlikely that you will suffer from mineral overdose if you maintain a balanced diet, if you do take extra supplements it is a good idea to keep an eye out. Often calcium is the mineral with most cases of mineral overdose reported, due to its nature of being present in a large number of foods. To watch out for this, we recommend you to have a consultation with a certified doctor first before deciding to go for supplements.

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