

Micro-organisms in the human digestive system



**ASSIGN
BUSTER**

Humans rely on micro-organisms for lots of things varying from health, welfare, food, and industrial products. Micro-organisms are microscopic organisms, which can only be seen properly with the aid of a microscope. These include viruses, microscopic fungi and bacteria. The human body continuously has lots of different micro-organisms on and in them, but mostly bacteria, some fungi and other micro-organisms which under normal circumstances in a healthy person is normally harmless, and can even be beneficial. These micro-organisms are also known as the Normal Flora or the gut flora. To help understand how the gut flora benefits humans there is a brief description of bacteria, viruses, and fungi below.

Bacteria are a single cell organism. They are capable of multiplying by themselves, as they are able to divide into two. They come in many different shapes and sizes, doctors are able to categorise them into groups by their characteristics. Bacteria exist everywhere, on and inside our bodies. Most of them are totally harmless and some of them are very handy to have, but some bacteria can cause diseases, either because they end up in the wrong place in our body e. g. blood, or simply because they are designed to cause disease. 100 bacterial species cause disease in humans (Finlay 2009)

Viruses are too small to be seen by the naked eye and are unable to multiply on their own, so they have to attach themselves to a cell inside their host and take it over in order to be able to reproduce themselves. Viruses consist of genetic materials (DNA or RNA) surrounded by a protective coat of protein. They are able to attach to the receptors of a cell to inject their DNA or RNA inside.

Fungi are germs that live on every one of us. The fungus is harmless a lot of the time, however sometimes it could cause problems like fungal infections. Lots of people get fungal infections, but they are usually easy to treat because fungus rarely spreads beneath the skin. Tinea is a type of a fungal infection of the skin, nails, or hair. When someone has Tinea on their skin it normally starts as a small area. When it gets bigger it becomes a ring shape. Tinea is often called ringworm because the shapes that Tinea leaves behind look like they are worms.

Gut flora is the collection of microscopic organisms that live within our digestive systems. The gut mainly consists of the small intestine, the large intestine and the anus. The small intestine has three parts the duodenum, the jejunum and the ileum. The large intestine consists of the cecum, the appendix, and the colon. The major functions of gut are digestion, absorption and excretion. Gut flora carry out many important functions for our health, such as the absorption of nutrients, support for the immune system, and the ability to fight other organisms.

Many people have a very negative implication when they hear the word bacteria. Bacteria have been the cause to many diseases in the past, present and will continue into the future; however bacteria do have some benefits and uses. There are thousands of different species of bacteria in the world and one group of bacteria Gut Flora has become proof that bacteria is a big benefit towards our survival. Gut Flora are a group of bacteria that consists of microorganisms which live in the digestive systems of humans. These micro-organisms have a vital role in the human body and without them people would probably have a decreased chance of survival. It is essential <https://assignbuster.com/micro-organisms-in-the-human-digestive-system/>

that people take care of their gut flora because a damaged gut flora has been the main cause of many diseases.

A healthy newborn baby enters the world in a sterile condition but after birth it very quickly acquires normal gut flora from food and the environment. It has been estimated that more than 400 different species or types of bacteria make their homes on humans. Those species present may vary from individual to individual due to physiological differences, diet, age and culture (Savage 1977).

Gut flora can also prevent allergies (Björkstén et al 2001). An allergy is an overreaction of the immune system to antigens which are not very harmful. Studies on the gut flora of infants and young children have shown that those who have different compositions of gut flora from those without allergies, those with a higher chances of having the harmful species *C diff* and *SA* have a lower frequency of *Bacterioides* and *Bifidobacteria*. (Björkstén et al 2001) Björkstén et al explained that help from gut flora stimulate the immune system and train it to respond properly to antigens. A lack of these bacteria in early life may lead to a poorly trained immune system which could over react to antigens. However Björkstén et al also stated that the difference in flora could also be a result of the allergies.

Another reason that bacteria help train the immune system is the epidemiology of the inflammatory bowel disease (IBD), such as Crohn's disease. Some forms of bacteria can prevent inflammation (Favier et al 2002). The incidence and occurrence of inflammatory bowel disease is high in developed countries that have a high standard of living, and is low in less

developed countries. It has increased in developed countries throughout the twentieth century. The use of antibiotics, which kill the gut flora along with the harmful infectious pathogens can also cause Inflammatory bowel disease, because antibiotics are not designed to target a specific bacteria, so it will kill the gut flora and decrease the population dramatically which will cause the gut flora the need to repopulate, this means that while the gut flora levels are low other more harmful bacteria or pathogens can attack our body more easily and become susceptible to infections and inflammatory bowel disease. This is explained in a bit further detail below.

A number of harmless bacteria in the gut make it unlikely that pathogens would not be able to compete for nutrients and receptor sites on a cell inside a healthy person. The gut flora prevents colonisation by potential invading pathogens, and so the gut flora releases a number of factors with antibacterial activity, bacteriocins, and colicins. Bacteriocins are antimicrobial substances which are secreted by the gut flora. As well as these substances, metabolic waste products such as organic acids and hydrogen peroxide are produced which help to prevent the colonisation of other species.

The gut flora plays a crucial role in nutrition, degrading a lots of different dietary substances that are usually considered indigestible (Savage 1986). By having a society of micro-organisms resident in our gut with their metabolic capabilities which allow them to break down these compounds for us, our gut will never need to evolve to the state of needing to do it for its self.

Micro-organisms of the digestive system provide some important nutrients for our body such as vitamin K, and B12. Vitamin K occurs in at least two major forms. They are vitamins K1 and K2 . Vitamin K1 is found mainly in fresh green vegetables. Vitamin K2 is produced by gut flora. Production of vitamin K gives people the ability for their blood to clot if for example their skin is either punctured or broken. It is also needed for bones to use calcium therefore it plays a major role in the formation of new bone. It is also believed that it prevents kidney stone formation. (Spanhaak 1998)

Altering the numbers of gut bacteria, for example by taking antibiotics, may affect the host's health and ability to digest food (Carman et al 2004). People may take the drugs to cure bacterial illnesses when prescribed by the doctor. Antibiotics can change the levels of gut flora, or allowing harmful bacteria to grow (Beaugerie and Petit 2004). Changing the numbers and species of gut flora can reduce the body's ability to break down the remaining carbohydrates which means that if they are not broken down they could absorb too much water and may cause diarrhoea (Carman et al 2004).