Digestion is the process where nutrients are released from the food we eat and absorbed into the bloodstream. Once absorbed, the nutrients are distributed to the cells in the body. The digestive system is basically one long tube that starts at your mouth, continues down through your throat, then twists and turns through your small and large intestines (colon), and finally past the rectum to end at your anus (Figure 1).

Other organs play a large role in digestion too, by providing enzymes required to help breakdown and absorb our food particles. The liver, pancreas and gallbladder all have a role to play in digestion.

The mouth
Most people will think that digestion starts in the stomach, however it starts straight up in the mouth. When hunger strikes you may notice how you start to salivate, this has two useful properties. Salivation helps prepare the mouth for the first stage of digestion by providing excess moisture to help lubricate the chewed food particles, making them easier to swallow and pass down into the stomach. The other benefit of salivation is that it provides the very first of enzymes required throughout the whole digestion process. The amylase group of enzymes are secreted in saliva and start to break down carbohydrate molecules, i.e. those found in fruits, vegetables and grains into simple sugars.
The stomach
The stomach is essentially a mixing and churning vessel with a capacity of approximately one litre, although the stomach can increase in size to accompany larger meals. The stomach continues the digestion process by secreting hydrochloric acid (stomach acid) and additional enzymes. It is well mixed with involuntary muscular movements to ensure all food particles are well digested before moving onto the next stage. The stomach is where proteins and fats are digested into their basic components, amino acids and fatty acids. Carbohydrate digestion occurs to a lesser degree in the stomach, due to it being too acidic for the amylase enzymes. The stomach contents (now a mixture called chyme) are ready to move into the small intestine.

With all of this acid getting around in the stomach how does the stomach not dissolve itself?? Well, the stomach has a thick layer of mucus that stops it from digesting itself. Also as the concentration of acid in the stomach increases a signal is sent to then down-regulate (decrease) the production of acid.

The small intestine
The stomach empties into the small intestine. The chyme that spills from the stomach into the small intestine encounters a new set of gastric juices and enzymes. Firstly from the pancreas and the intestines themselves which help to complete the digestion of proteins into amino acids. Once again carbohydrate digestion picks up. In the stomach the environment is to acidic for the amylase enzymes to activate. The pancreas excretes alkalising enzymes into the small intestines to reduce the acidity and reactivates the amylases so that carbohydrates can continue to be broken down into simple sugars. From the gallbladder is a green substance called bile. This is actually made in the liver but stored in the gallbladder for when it is needed. Bile is required to emulsify fats with water. Without bile we would be unable to absorb fat very easily and would have a problematic digestive system. The small intestine is where alcohol is broken down into simple sugars.

Muscular contractions move food down through the small intestine. This is where the body absorbs the digested sugars, amino acids, fatty acids, vitamins and minerals into the cells.

Did you know that nutrients are absorbed at different rates? Carbohydrates are absorbed first because they can be digested quickly into sugar units. Proteins are absorbed next, followed by fats which take the longest. This is why a fatty meal keeps you feeling fuller than a salad for example. Vitamins that are fat soluble (vitamins A, D, E & K) absorb more slowly than the remaining water soluble vitamins.

The large intestine (the colon)
The large intestine is often referred to as the colon. By the time the small intestine empties into it digestion is approximately 95% complete. Very little digestion occurs in the large intestine. What is left of the original food now, is pretty much the indigestible fibrous material. This fibre however serves many purposes, including making the exit of faeces easier. Fibre helps to feed the good bacteria that live in the colon. These bacteria produce vitamin B12 and vitamin K for us. So what’s left after all of that? The faecal matter is made up of indigestible food, cells that have sloughed off the intestinal tract along the way and bacteria. In fact, 30% of the total weight of the faeces is bacteria, which live in permanent colonies in the colon.

Helping improve digestion
Chewing your food to break it into smaller particles will help make the rest of the digestive process much more efficient. Also taking time to enjoy your meal rather than eating on the run, aids in healthy digestion and helps to prevent air getting trapped in the stomach and coming out as a burp! If you are prone to flatulence, try chewing your food more. In fact we should all aim to chew each mouthful to a liquid consistency. This results in enzymes being better able to do their job in the stomach and small intestine, leaving less undigested food in the colon. Undigested food in the colon is consumed by the bacteria, which then produce gas, as a by-product. Avoid drinking with meals or directly after eating, as this will decrease the concentration of acid and enzymes. Instead wait at least 20 minutes, either side, before a beverage. Remember to enjoy your meals and be kind to your digestive system, your family will thank you for it!

Immunity and your gut
A compromised gut can affect your body’s ability to ward off those nasty ills and chills. A compromised gut is one where the integrity of the gut lining is disrupted, sometimes referred to as intestinal permeability. This allows pathogens and common food allergens to bypass normal absorption mechanisms, enter the blood stream in a means that the immune system does not recognise, thus triggering a series of responses that lead to food intolerances and IBS like symptoms. Those who have suffered from IBS like symptoms may benefit from removing common food allergens from their diets, allowing the gut to settle and then look to help repair the gut lining. Studies have highlighted the benefits of Aloe Vera, the amino acid glutamine and bovine colostrum, with helping to support a healthy digestive system.