- Nutrition

How food structure affects digestion

Waikato Times · 8 Mar 2021 · 8 · Alejandra Acevedo-Fani and Glenda Lewis Dr Alejandra Acevedo-Fani is a Marie Curie Fellow and a researcher at the Riddet Institute. Glenda Lewis is a science writer.

There is a tendency these days to overthink what goes in our mouths and analyse nutrition in terms of each food component – like carbohydrates or fats. This article does not set out to confuse your dietary considerations more than they already are, but simply to make the point that food structure really does matter.

Our digestion system has evolved to deconstruct complex animal and plant tissues, and deliver the goods to our bloodstream at a suitably regulated rate that does not overtax organs, such as the liver.

The stomach, with its strong acids and muscular motion, breaks down most of our food, which the small intestine is then able to absorb and transfer to the blood as smaller molecules.

It is important that enough is left over to feed our co-dependent bacteria – billions of them – resident in the large intestine. Fibre is not just about helping along a regular throughput of waste.

There is a world of difference between eating an apple and drinking apple juice. The juice can cause a short-term spike in our blood sugar because the rate at which sugar gets into our bloodstream is much faster and, usually, there is a lot more of it.

The glycaemic index (GI), which many people are familiar with, is a measure of the rate at which particular foods affect blood sugar levels.

As well as containing lots of fibre and exercising our jaws and teeth, an apple has a low GI score, which means the digestion and absorption rate is slow, and therefore does not stress insulin production.

This is critical information for diabetics and anyone who wishes to avoid becoming diabetic.

Researchers at the Riddet Institute, New Zealand's Centre of Research Excellence in

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food, are looking to develop the same sort of helpful reference as the GI for fats and proteins, which are the other main food constituents and body builders.

Food researcher Dr Alejandra Acevedo-Fani studies how the structure of food affects the delivery of nutrients during digestion, and how to improve nutrition quality generally.

An important part of this research is figuring out how to most effectively deliver the burgeoning range of ‘‘bioactive’’ substances people want to boost immunity or confer some other health benefit, for example antioxidants, probiotics, vitamins or minerals that may be missing from our diet.

The challenge is to get them past the extreme environment of the stomach, to the small intestine, intact. They may be encapsulated or delivered in a natural food like yoghurt.

‘‘We have been experimenting with different bioactives, like those in turmeric, and delivering them in various food products to see how they are digested and their potential impact on health,’’ says Acevedo-Fani.

‘‘And with all the new plant proteins coming onto the market, we need to characterise them properly, including testing their digestibility – in other words, how well our digestive system is able to access the nutrients which are sometimes locked into tough plant cell walls and internal structures.’’

Food is more than the sum of its parts.