

TECHNICAL WHITE PAPER



THE PRODUCT MAKERS

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The Gut Microbiome

Polyphenol Rich Sugarcane Extracts

Over the past 5 years, the volume of publications on the importance of the gut microbiome on human and animal health and well-being has exploded. This has occurred in the scientific literature, the popular press, television news, internet blogs and documentaries. Whilst bacteria have typically been associated with poor health and disease, consumers are beginning to understand that good bacteria can be the frontline defense of the body.

It is now well accepted that microbiome health is driven by consuming the right diets, particularly those that include fruit, vegetables, herbs, seeds and cereals and found in beverages such as coffee, tea, cocoa and wine. These are all rich in polyphenols, flavonoids and fibre.

Polyphenols are secondary plant metabolites and are currently a topic of great scientific attention, due to the interest in their potential health benefits. These include anti-cancer, anti-oxidant, anti-microbial and anti-inflammatory properties. Polyphenols are also implicated in preventing chronic diseases such as cardiovascular diseases, diabetes, obesity and neurodegenerative diseases, among others.

But what about the sugarcane plant as a source of polyphenols?

The literature abounds with studies which demonstrate the reciprocal relationship between polyphenol-rich diets, the bioavailability of polyphenols and the balance in the microbiota phyla that exist in the colon. The polyphenols and other plant derived compounds present in the sugarcane plant are able to act as a prebiotic fertiliser to help a healthy gut microbiome grow.

The importance of these prebiotic polyphenols on the host immune system and their contribution to activation of provitamins and their modulation of lipid metabolism are beginning to be understood in much greater detail. The communication between the gut microbiome and the brain is also evolving and showing a positive link with protection against many neurological disorders. There is a large body of evidence showing the beneficial effect of polyphenols on cognitive performance and the connection between the microbiome and the brain may be a clue to the mechanism driving these results.

It is well known that phenolic compounds have bacteriostatic and bactericidal properties, as well as their metabolites produced by the gut microbiota *in vivo*. It is thought that both polyphenols and their metabolites also inhibit gut pathogens and bacterial infections in the intestines and urinary tract. Including these polyphenols in the diet is a proactive approach to reducing bacteria that could be damaging to the body.

However, it is not just the human gut microbiome that is worth considering for health and wellness, because the sugarcane plant has its own unique and powerful microbiome. The microbes that live in sugarcane, known as endophytes, are microscopic factories of nutrients that benefit the sugarcane plant and can also be helpful for human health. TPM's patented processing of sugarcane to make our bioactive extracts, inactivates these microbial mini factories to increase the stability and shelf life of our products, but the beneficial nutrients produced by these microbes remain behind in the extracts. These beneficial

nutrients are known as “post-biotics” and are an emerging area in the discussion around healthy microbe maintenance.

All of the TPM bioactive products from the sugarcane plant are rich in these compounds and are as high as those from extracts from many of the commonly known “super-fruits” and better known botanical sources.

Over 5 years ago TPM started researching the use of products such as Phytolin™, Polynol™ and Polygain™ as modulators of general gastrointestinal digestion as well as their effects on the microbiome.

Some of the above products were even combined with both soluble and insoluble dietary fibre and proteins to enhance their functionality and nutrient properties.

These studies have been undertaken in collaboration with academic institutes including Melbourne and La Trobe Universities, through funding PhD’s and other post-graduate research.

The research at La Trobe has demonstrated that Polygain™ a supplement for horses has a dramatic effect on selected phyla in the gut that mitigate methane production while encouraging other healthy phyla to increase proportionally. These findings are now being extended to ruminants and humans.

The Melbourne University PhD project on the effect of TPM products with and without carriers such as soluble, insoluble fibres, other complex polysaccharides and proteins is reaching its final year where studies will move onto animal trials. To date results are extremely promising.

TPM are committed to further on-going research on the functional properties related to the microbiome using their vast range of products from sugarcane to better understand their applications and use in both human and animal health and wellness.

Further reading

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