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All disease begins in the gut

"All disease begins in the gut," is a quote attributed to the Greek physician, Hippocrates almost 2 500 years ago.



*The peel and red fruit of
Cara-cara on top,
Red Lina below.*

I recently listened to a fascinating podcast by Prof Patrick Bouic, immunologist with Synexa, and extraordinary professor at Stellenbosch University. Some of the main takeaways from this interesting talk were as we know now:

- the people most at risk of contracting COVID-19 have pre-existing comorbidities
- in line with Hippocrates, he informs his patients, "Let nutrition be thy medicine," where he goes on to explain the importance of eating the correct foods: fruit, vegetables, good fats, oils and proteins. Merely taking antioxidants, supplements, and statin treatment while continuing to eat badly, will not reverse high cholesterol, diabetes, and blood pressure conditions. Not having a good gut flora, which is common in conditions such as diabetes, does not allow for uptake of these antioxidants. He also touched on the controversial issue of sugars and carbohydrates as virtually paralysing your immune system. So, support your gut flora with a good flora supplement rather than the heaps of pill supplements we are bombarded with. This is in keeping with an article I read by Dr Susan Taylor Mayne, professor at Yale school of Public Health, where she explains: "Pills deliver vitamins out of context. The vitamins in fruit and vegetables come with thousands of other phytochemicals, vitamins, minerals, and fibre, which work synergistically in whole foods to promote health and lower disease risk."

This fits with the five-a-day fruit and vegetable concept, widely recognised to assist in reducing

the risk of many types of cancer, as well as hypertension, heart disease, stroke and diabetes – the critical COVID-19 conditions noted by Prof Bouic.

Citrus is generally considered to be one of these five-a-day components. Specifically, oranges and other citrus fruits contain several components that may affect health in a beneficial way. Of these, vitamin C, carotenoids, (including lycopene's) and polyphenols have been actively researched in recent times.

Listening to this talk reminded me of a very interesting presentation in the 2012 Citrus Congress by Prof Gary Williamson of the school of Food Science at Leeds university. I found my notes, and his explanation of diet clearly affecting health and disease risk. Williamson noted the well-known Vitamin C performing several functions in the body, including the prevention of scurvy and additional health benefits through antioxidant action. Additionally, high levels of the most commonly found polyphenols, namely Hesperidin and Naringin are found in oranges and grapefruit respectively, and are unique to citrus fruits. As I remember from the talk, Hesperidin was not quite as powerful an antioxidant as the berry polyphenols. However, in a healthy gut flora, this breaks down into the even more powerful antioxidants Hesperitin and Naringin, respectively. Orange juice can contain hundreds of milligrams of Hesperidin per portion.

In the first weeks of the pandemic it was accepted that the symptoms most commonly reported by patients affected by COVID-19

included a cough, fever and shortness of breath. However, in the past few weeks, pre-clinical evidence suggests other major conditions of high blood pressure, thrombosis and pulmonary embolism seeming to suggest that the virus is targeting the endothelium as well, and not only attacking the respiratory tract.

I've read numerous papers since Prof Williamson's presentation of trials of Hesperidin in the presence of colonic microflora breaking Hesperidin down to Hesperitin, which assist cardiovascular function, reduce blood pressure in overweight individuals and reduce endothelial dysfunction. The beneficial effects of citrus have also been reported repeatedly, suggesting that the intake of citrus flavanones can contribute to improved GI functioning and gut health.

In March, on a citrus tour to Spain to see lycopene and anthocyanin (red) citrus varieties, we met with Prof Lorenzo Zacarías of the Spanish National Research Council, who is involved with the metabolic pathways of components related to food quality (carotenoids, lycopene, ascorbic acid, among others). We met with our partners in Spain, Citrus Rosso to discuss two cultivars we manage in SA, and they in the Mediterranean basin, Rosalina, (early Red Navelina mutation) and Valentine (a late Red Navel mutation). Prof Zacarías is interested in the presence of lycopene, a red linear carotene both in the peel and the pulp. It's a very unusual feature in citrus fruits.

This property confers relevant nutritional interest due to its powerful antioxidant activity and possible health benefits of the fruit. Recently I also read of its assistance in prostate conditions. More will be reported on this ongoing research in future articles.

These different components of antioxidants and polyphenols from citrus fruits provide benefits to health which can help to reduce the risk of chronic disease and maintain the general health of the population in many countries. The consumption of citrus fruit and the increasing interest in the health properties



of lycopene and anthocyanin can make a major contribution to health, due to the availability and reasonable price of citrus compared to other fruit types.

And during one of the plenary sessions in 2012, Ademerval Garcia noted that Coca-Cola now includes orange juice in the product offering, due to its health benefits and affordability (Garcia was from a Coca-Cola subsidiary). This is a great endorsement for citrus. ✿