POSTERS

P01

*In-vitro* model of mineral and organic acid absorption from tropical crops
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**Background** – The mineral and organic acid components of plant foods make a contribution to the nutritional quality of fruits and vegetables alongside other micro- and macronutrients that are studied more extensively. The nutrient composition of many tropical crops has not been described in detail; in particular there is a lack of information on mineral and organic acid components. In addition to content, the bioavailability of nutritional components needs to be determined in order to quantify likely effects of food on nutritional status. Here we report a study of the release of minerals and organic acids during simulated digestion and subsequent uptake as mimicked by Caco-2 cell monolayers.


**Design** – Freeze-dried or raw samples of a range of tropical crops are cut into slices of 4g. An *in-vitro* mimic of human digestion is used, comprising oral (human α-amylase 100 units/L, pH 6.9), gastric (porcine pepsin 800-2,500 units/mg, pH 2), and pancreatic (pancreatin activity 4 X USP specification and bile extract, pH 6) digestion models followed by an *in-vitro* model of small intestine absorption using Caco-2 cell monolayers.

**Outcomes** – Mineral and organic acid contents of a range of tropical crops, their release during simulated digestion, and their uptake by Caco-2 cells will be reported.

**Conclusion** – This information will be useful in defining the opportunity for tropical crops to contribute to mineral nutrition. The potential for fruits and vegetables to be a prime source of balanced mineral nutrition opens up an under-exploited opportunity for both food industry innovation and public health messages, through incorporation of relevant plant materials into a range of food products and provision of evidence for new marketing messages promoting fresh produce.

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P02

Anti-inflammatory effects of kiwifruit
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**Background** – Inflammation is a normal physiological immune response to injury or foreign insult, however, tissue can become damaged when inflammation is prolonged. This chronic inflammation appears to play a fundamental role in many chronic diseases such as arthritis, cancer, heart disease and even diabetes and obesity but it may be possible for fruit to modify or attenuate the inflammatory response.

**Objective** – We explored the anti-inflammatory properties of kiwifruit, specifically the ability to attenuate the production of the inflammatory cytokines tumour necrosis factor (TNF)\(\alpha\) and interleukin (IL)-1\(\beta\) by human cells after stimulation with bacterial lipopolysaccharide (LPS).

**Design** – Two cell types were used in this study. These were a human monocyte THP-1 cell line and whole blood from three donors which were pre-incubated with solvent or aqueous extracts from in-house and commercially available ZESPRI\(^\text{TM}\) kiwifruit cultivars and then stimulated with LPS. This was followed by an ELISA assay of the cell media supernatant to investigate attenuation of TNF\(\alpha\) and IL-1\(\beta\) production.

**Outcomes** – Induction of TNF\(\alpha\) and IL-1\(\beta\) by LPS was demonstrated. Both cell types responded to LPS in a dose responsive manner, however, the whole blood of each donor was shown to respond differently to increasing LPS dose. After an initial screen of TNF\(\alpha\) attenuation in THP-1 cells, two aqueous extracts from ZESPRI\(^\text{TM}\) GOLD and ZESPRI\(^\text{TM}\) GREEN kiwifruit were shown to reduce TNF\(\alpha\) production in a dose dependent way. Further analysis of these extracts to investigate the attenuation of IL-1\(\beta\) production in THP-1 cells, as well as attenuation of TNF\(\alpha\) and IL-1\(\beta\) production in whole blood from three donors was carried out. It was demonstrated that these two extracts were able to reduce IL-1\(\beta\) production by THP-1 cells in a dose dependent manner. These extracts also reduced TNF\(\alpha\) and IL-1\(\beta\) production in whole blood from three donors, although the response was donor dependent.

**Conclusions** – ZESPRI\(^\text{TM}\) GOLD and ZESPRI\(^\text{TM}\) GREEN Kiwifruit aqueous extracts were demonstrated to give good anti-inflammatory activity in human THP-1 cells and whole blood *in vitro*. The extent of the anti-inflammatory effect in whole blood was donor dependent. These specific fruits may be useful for inclusion in diets to help combat the inflammation underlying many chronic diseases associated with our current lifestyle.