



## Kiwifruit and Digestive Comfort: *In Vitro* and *In Vivo* Supporting Evidence

Kiwifruit (*Actinidia deliciosa*) hosts a number of beneficial properties for gut health. In addition to its high fibre content, water holding capacity and levels of the vitamins C and E, its consumption has been reported to provide relief of symptoms of gastrointestinal discomfort. This may be due to the protease actinidin, contained primarily in green Hayward kiwifruit, with reduced levels in the SunGold variety.

Protein is an essential component of a balanced diet. Dietary protein provides a number of building blocks critical for life and its efficient digestion is important for full nutritional value. However, meals high in protein can contribute to gastrointestinal discomfort, with symptoms such as stomach pain, bloating and constipation. Early work highlighted the presence of the actinidin protease in kiwifruit, an enzyme with a role in protein digestion. These findings have led the Riddet Institute to conduct a number of investigations into the detailed effects of kiwifruit on the digestion of dietary protein.

Our first experiments were carried out *in vitro*, and showed that kiwifruit actinidin enhanced the digestion of a range of food proteins, including casein, meat protein and gluten. Subsequently, elegant assays using Wide-Bore Nuclear Magnetic Resonance in rats determined that actinidin from green kiwifruit enhanced the digestion and stomach emptying of a number of dietary proteins *in vivo*. This work was extended to pigs, the best model organism for human digestion, where once again, kiwifruit actinidin proved a significant meat protein digestion aid. In humans, initial work shows that the consumption of green kiwifruit alleviates all measures of gastric discomfort when consumed with a large meal of meat.

Recently, investigations have also focused on kiwifruit fibre and its digestibility; fibre plays key roles in digestion and gastrointestinal comfort by maintaining gut function. In the growing pig, both soluble and insoluble kiwifruit fibre was highly digested in the foregut and hindgut, respectively, emphasizing the role of kiwifruit as a source of dietary fibre.

Therefore, kiwifruit consumption has the potential to contribute greatly to gastrointestinal comfort, protein digestion and gut health. This talk provides a summary of these effects, the implications of our findings and where we plan to focus our efforts as we move into the future.