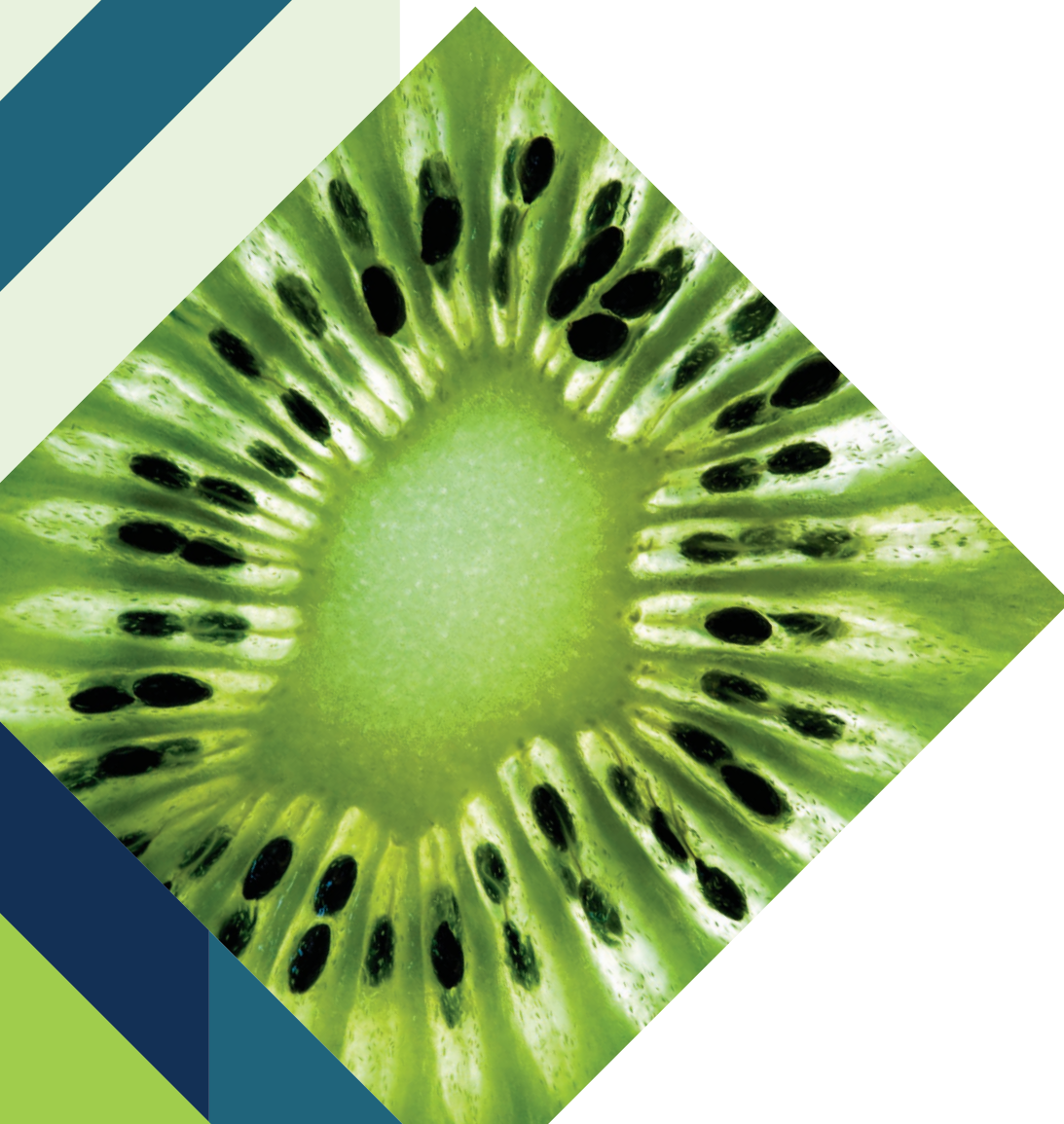


PhenActiv® is a premium digestive health enhancer and anti-oxidant.



# PhenActiv®

KIWIFRUIT CONCENTRATE POWDER



PhenActiv®

Green Kiwifruit are one of the worlds most nutrient dense fruits

### Storehouse of Nutrition

PhenActiv®, freeze dried kiwifruit concentrate powder, is a premium digestive health enhancer and antioxidant manufactured entirely from New Zealand grown, GMO free, green kiwifruit (*actinidia deliciosa*).

Kiwifruit are well known as a popular snacking fruit, packed full of essential nutrients. In fact, the green kiwifruit that provide the raw material for PhenActiv® have been shown to be one of the most nutrient dense fruits in the world<sup>1</sup>.

Because kiwifruit, particularly New Zealand grown kiwifruit, are such a great storehouse of nutrition, scientists have long been interested in their potential health benefits. As a result, over the years kiwifruit have been extensively studied, leading to an excellent understanding of their remarkable nutritional properties.

### Unique Kiwifruit Enzyme Enhances Protein Digestion

Kiwifruit contains a naturally potent proteolytic enzyme, called actinidin, which enhances protein digestion. Actinidin has been shown during in-vitro studies to enhance the digestion of a number of different food proteins, including soy, meat, milk, gluten and gliadin<sup>2,3</sup>.

Additionally, actinidin may also have a role in improving gut motility through stimulating receptors of the colon<sup>4</sup>, which is an important contributor to improved bowel function.

The active enzyme content of PhenActiv® is protected by specialised pre-processing and freeze drying techniques which maintain optimal temperature and pH conditions.

**ACTINIDIN ENZYME CONTENT OF >20,000  
ACTIVITY UNITS / GRAM**

### Naturally Occurring Phytonutrients

Naturally occurring plant chemicals, known collectively as phytonutrients, are largely responsible for some of the impressive health promoting effects of plant foods, and kiwifruit are no exception to this. The major phytonutrients in kiwifruit include polyphenols (flavonoids and phenolic acids), carotenoids (lutein and  $\beta$  carotene) and vitamins (C and E)<sup>5</sup>.

Whilst the full range of benefits from these naturally occurring compounds are not yet fully understood, some of their effects, such as anti-oxidant benefits and anti-inflammatory activity are well known.

### Polyphenols

The polyphenol content of kiwifruit has been widely studied and in particular green kiwifruit are known to contain a range of flavonoids and phenolic acids.

**TOTAL POLYPHENOL CONTENT OF  
>25MG GAE/GRAM<sup>6</sup>**

### Anti-oxidant benefits

Antioxidants are chemical compounds that help protect the body by neutralizing the damaging effects of reactive agents such as free radicals.

PhenActiv® contains several naturally occurring plant compounds that contribute anti-oxidant activity to the finished product. In particular Vitamin C, along with the total polyphenol content are major contributors to anti-oxidant activity<sup>7</sup>

### Specialised Blend Delivers Optimal Nutrient Profile

Phytonutrients in kiwifruit are not just isolated in the flesh, but are also present in high concentrations in the skin.

In particular, kiwifruit grown in New Zealand have built up high levels of sun protection in their skins due to the intense sunlight and low levels of pollution in this part of the world. In fact, New Zealand grown kiwifruit have been shown to have almost twice the levels of anti-oxidants in their skin as those grown in the USA or parts of Europe.

*PhenActiv® is a specialised blend of both the concentrated seedless pulp of the kiwifruit and the skin, ensuring as much of the beneficial nutrition as possible is retained.*

Kiwifruit are naturally high in both soluble and insoluble dietary fibre, with much of this concentrated in the skins.



# PhenActiv®

## Naturally Occurring Dietary Fibre Supports Optimal Gastro-intestinal Health

PhenActiv® contains a portion of the kiwifruit skin, something that is normally discarded when eating the fresh fruit, boosting the overall fibre content of this product in a totally natural way.

The combination of both soluble and insoluble fibre in PhenActiv® maximises the digestive health benefits to the consumer as the two types act in a synergistic fashion.

**8% -15% TOTAL DIETARY FIBRE**

### Prebiotic Effects

A healthy gut requires a healthy amount of beneficial bacteria. Over the past decade nutritional science has advanced its understanding of these compounds, known as prebiotics, which can provide a substrate for the growth of beneficial bacteria, providing health benefits for the consumer.

Several different compounds found in green kiwifruit are thought to contribute prebiotic activity. Shroder and Nicolas<sup>9</sup> purified an indigestible carbohydrate oligosaccharide, galactoglucomannan, from green kiwifruit which they note may act in a prebiotic manner on the gut microflora. In other research, daily consumption of a freeze dried extract of fibre obtained from green kiwifruit increased the colonic load of beneficial bacteria (lactobacillus) in an animal model compared to control<sup>10</sup>.

### PhenActiv® Profile

<b>Raw Material:</b>	New Zealand GMO free Green Kiwifruit ( <i>actinidia deliciosa</i> )
<b>Physical characteristics:</b>	< 500 micron, freeze dried, green to brown powder
<b>Additives:</b>	None
<b>Total Carbohydrate:</b>	> 60%
<b>Total Dietary fibre:</b>	>8%
<b>Actinidin Enzyme activity :</b>	>20,000 AU's/gram

### PhenActiv® Advantages

- Natural digestive health enhancer with anti-oxidant properties
- Contains kiwifruit skin, a concentrated source of phytonutrients and dietary fibre
- No artificial additives
- Non GMO
- 100% natural

<sup>1</sup> Lachance PA, Sloan AE. Fruits in preventative health and disease treatment: Nutritional ranking and patient recommendations. Proceedings of the Symposium on Advances in Clinical Nutrition. The American College of Nutrition 38th Annual Meeting, New York. September 26th-28th, 1997.

<sup>2</sup> Kaur L, Rutherford s, Moughan P, et al. Actinidin enhances protein digestion in the small intestine as assessed using an in vitro digestion

model. Journal of Agricultural Food Chemistry. 2010;58:5074-5080.

<sup>3</sup> Carlos A. Montoya, Shane M. Rutherford, Trent D. Olson, Ajitpal S. Purba, Lynley N. Drummond, Mike J. Boland and Paul J. Moughan (2014). Actinidin from kiwifruit (*Actinidia deliciosa* cv. Hayward) increases the digestion and rate of gastric emptying of meat proteins in the growing pig. British Journal of Nutrition, 111, pp 957-967. doi:10.1017/S0007114513003401.

<sup>4</sup> Udani J, Bloom. Effects of kivia powder on gut health in patients with occasional constipation: a randomised, double-blind, placebo-controlled study. Nutrition Journal 2013 12:78

<sup>5</sup> Boland M, Moughan P.J. Nutritional benefits of kiwifruit. M Boland and P.J. Moughan (Eds.). Advances in Food and Nutrition Research Series 2013. Elsevier, UK.

<sup>6</sup> Gaelic acid equivalents per gram: Folim-Ciocalteau method. Food Chemistry 120 (4),993-1003.

<sup>7</sup> Du G, Li M, Ma F, Liang A. Antioxidant capacity and the relationship with polyphenol and vitamin C in Actinidia fruits. Food Chem. 2009;113:559-562.

<sup>8</sup> Fiorentino A, D'Abrosca B, Pacifico S, Mastellone C, Scognamiglio M, Monaco P. Identification and assessment of antioxidant capacity of phytochemicals from kiwi fruits.

J Agric Food Chem. 2009;57:4148-4155.

<sup>9</sup> Schroder R, Nicolas P, Vincent SJ, Fischer M, Reymond s, Redwell RJ: Purification and characterisation of a galactoglucomannan from kiwifruit (*actinidia deliciosa*). Carbohydrate Res. 2001, 33193):291-306.

<sup>10</sup> Han K, Balan P, Molist-Gasa F, Boland M. Green kiwifruit modulates the colonic microbiota in growing pigs. Lett Appl Microbiol. 2011;52:379-385.