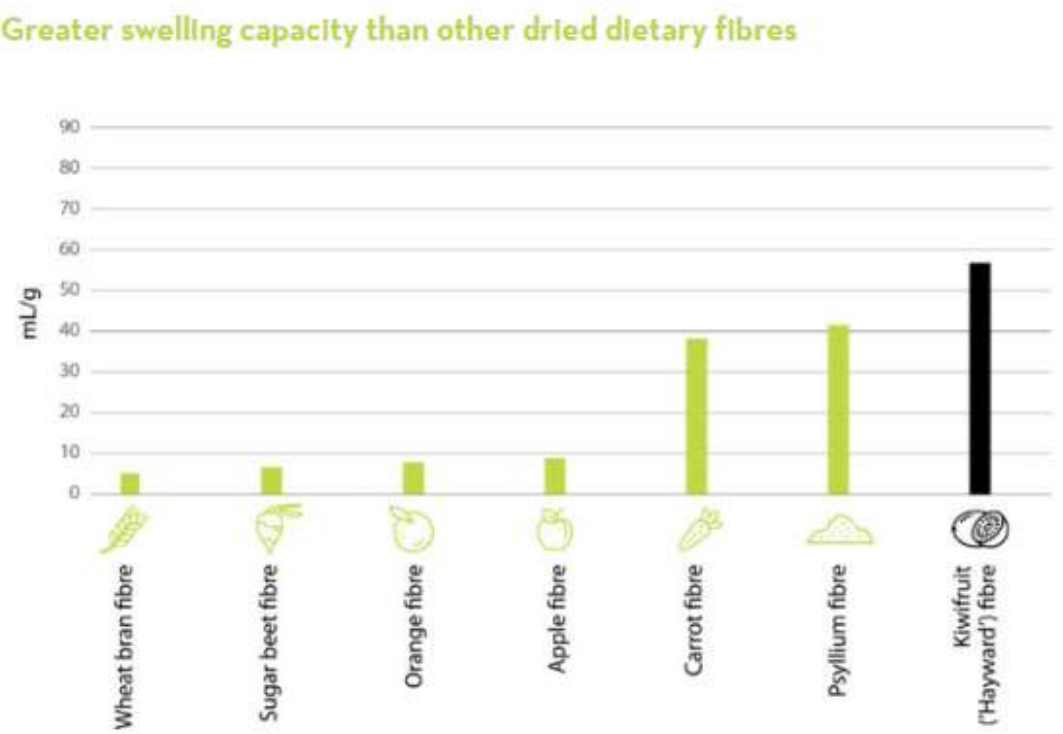
Kiwifruit Fibre Composition and Hydration Properties

KIWIFRUIT FIBRE COMPOSITION

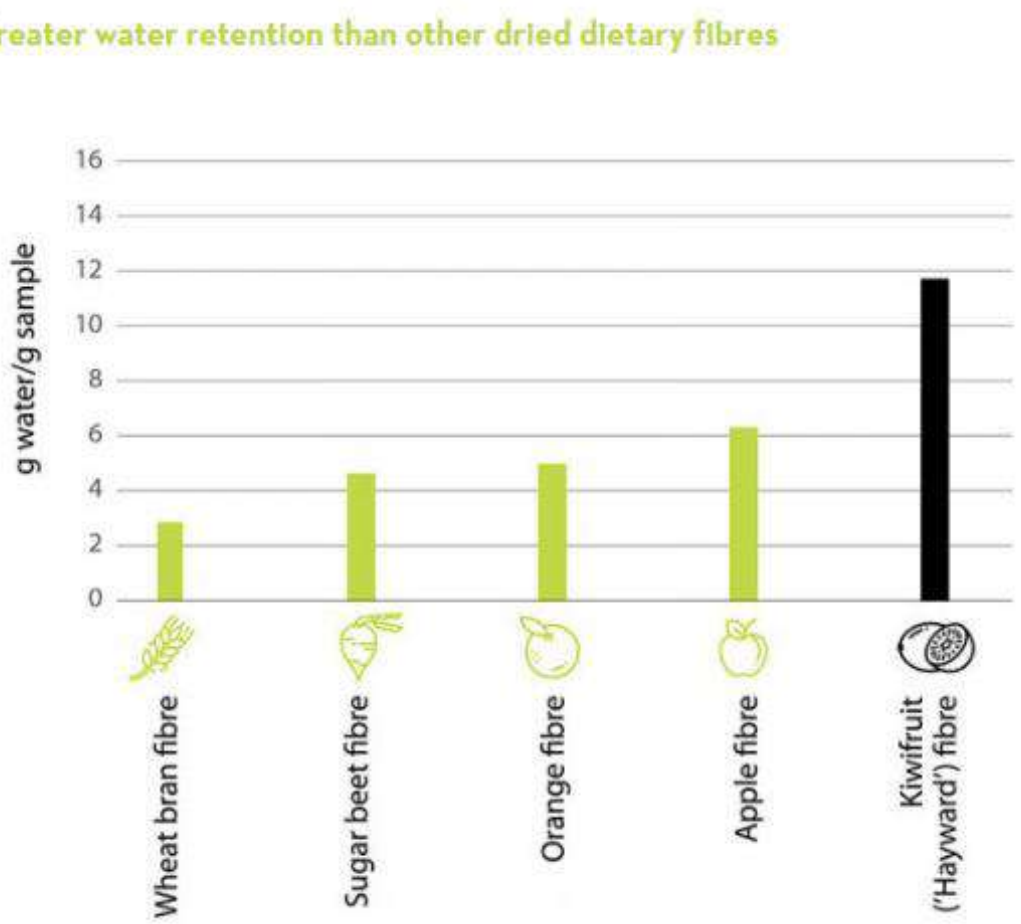
The dietary fibre content of green (Hayward) and gold (Gold3, SunGold) kiwifruit is 3.0 g/100 g and 1.4 g/100 g, respectively (United States Department of Agriculture, 2016), and comprises approximately 1/3 soluble and 2/3 insoluble fibre (Carnachan, Bootten, Mishra, Monro, & Sims, 2012). The soluble fibre consists of mostly pectic polysaccharides, and the insoluble is mostly cellulose and hemicelluloses with a small amount of pectin.

KIWIFRUIT FIBRE HYDRATION PROPERTIES

Kiwifruit fibre has unique hydration properties. It has the capacity to swell (the volume fibre has in water after passively settling), reaching over three times its volume in the original fruit (Sims & Monro, 2013). Compared to rehydrated dietary fibre preparations, freeze-dried kiwifruit fibre's swelling capacity is twelve times higher than wheat bran, more than six times higher than apple fibre, and one and a half times higher than psyllium (Sims & Monro, 2013).



Kiwifruit fibre also has high water retention capacity - the amount of water that is bound to insoluble fibre and is not separated from fibre by centrifugation (Robertson, et al., 2000). The water retention capacity of kiwifruit fibre is 12 – 13 g water/g insoluble fibre, and is about four times that of wheat bran and twice that of apple fibre.



The water retention and swelling capacity of kiwifruit fibre is mainly attributable to the insoluble pectin and cell wall components. Water gets in between the links in the cell walls and bonds between the polysaccharide chains causing the fibre to swell and retain water. Shorter non-structured polymers, such as inulin and other oligosaccharides, would be mostly soluble and therefore would not bind water so easily.

The hydration properties of kiwifruit fibre affect the dynamics of nutrient absorption, reducing mixing in the bowel and diffusion (Mishra and Monro, 2012; Monro, 2013).

Kiwifruit fibre may also add to faecal bulking (Sims and Monro, 2013), however it is also completely fermentable by the microflora and therefore may have a significant role in modulation of the microflora (Rosendale, et al., 2012).

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