

# QUERY THIS: KIWIFRUIT PECTIN

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## Actazin® and Livaux® are superior to common prebiotics

### Kiwifruit pectin in Actazin® and Livaux®

Kiwifruit pectin, found in Actazin® and Livaux®, is a prebiotic polysaccharide. It is a highly branched macromolecule comprised of a methyl-esterified polygalacturonate core with sidechains of rhamnose, arabinose, galactose, fucose, galacturonic acid, etc.

### Kiwifruit pectin in Actazin® and Livaux® is more structurally intact than commercially processed pectin

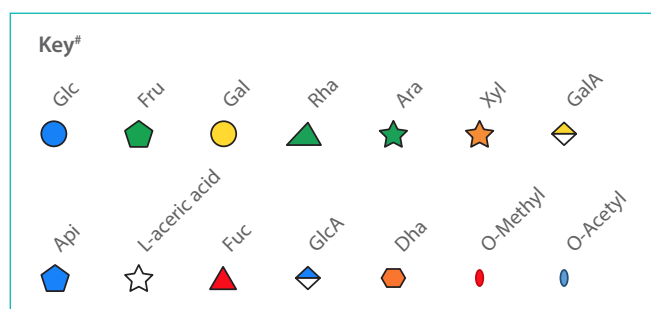
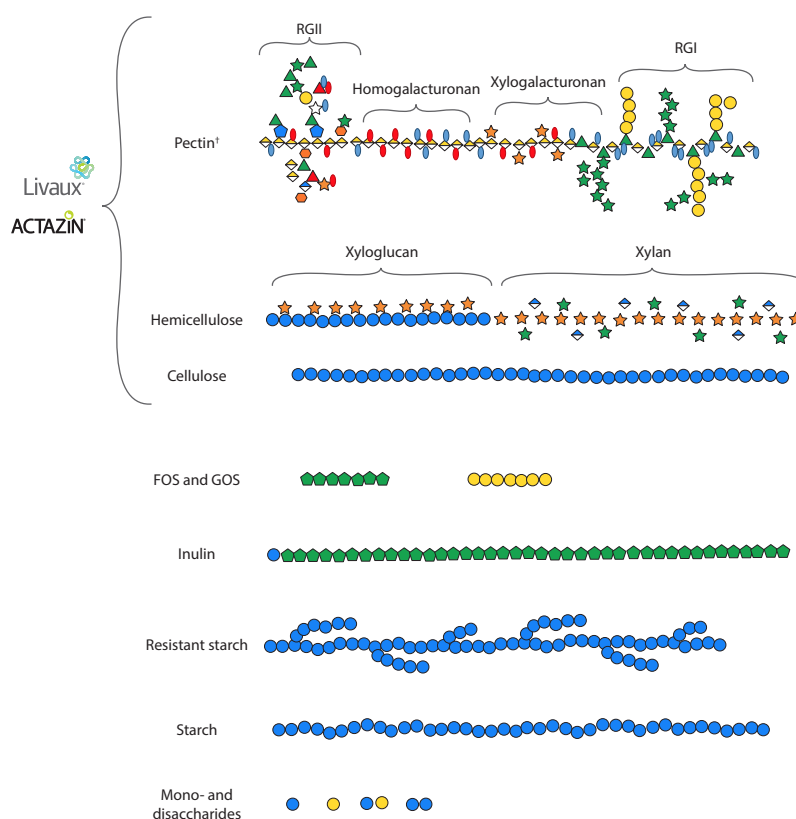
Some of the kiwifruit pectin side chains, such as rhamnogalacturonan II (RG II), are amongst the most structurally complex polysaccharides in nature. These side chains are more structurally intact in the gently prepared Actazin® and Livaux®, compared to commercially processed pectin.

### Kiwifruit pectin in Actazin® and Livaux® ferments slowly

As a prebiotic, kiwifruit pectin is more slowly fermented by our good gut bacteria along the whole length of our colon, compared to common prebiotics, such as inulin, fructo-oligosaccharides (FOS), galacto-oligosaccharides (GOS), or resistant starch (RS).

### Common prebiotics ferment quickly

Common prebiotics are fermented rapidly and early on in our colon. This is because they have a much simpler make-up than the more compositionally and structurally complex kiwifruit pectin. Inulin, FOS, GOS and RS are only comprised of chains of sugars (fructose, galactose and glucose, respectively). All of this means that inulin, FOS, GOS and RS require a relatively simple toolbox of bacterial enzymes to break them down into useable bacterial fermentation substrates. While on the other hand, kiwifruit pectin with its methyl-esterification and complex RG side chains requires a very diverse assortment of enzymes from a consortium of specialised bacteria to break it down.



#Varki et al., 2015. Symbol Nomenclature for Graphical Representation of Glycans. Glycobiology 25 (12), 1323-1324  
\*Structure adapted from: Harholt et al., 2010. Biosynthesis of pectin. Plant Physiology 153, 384-395.

## Kiwifruit pectin in Actazin® and Livaux® ferments along the whole length of the colon

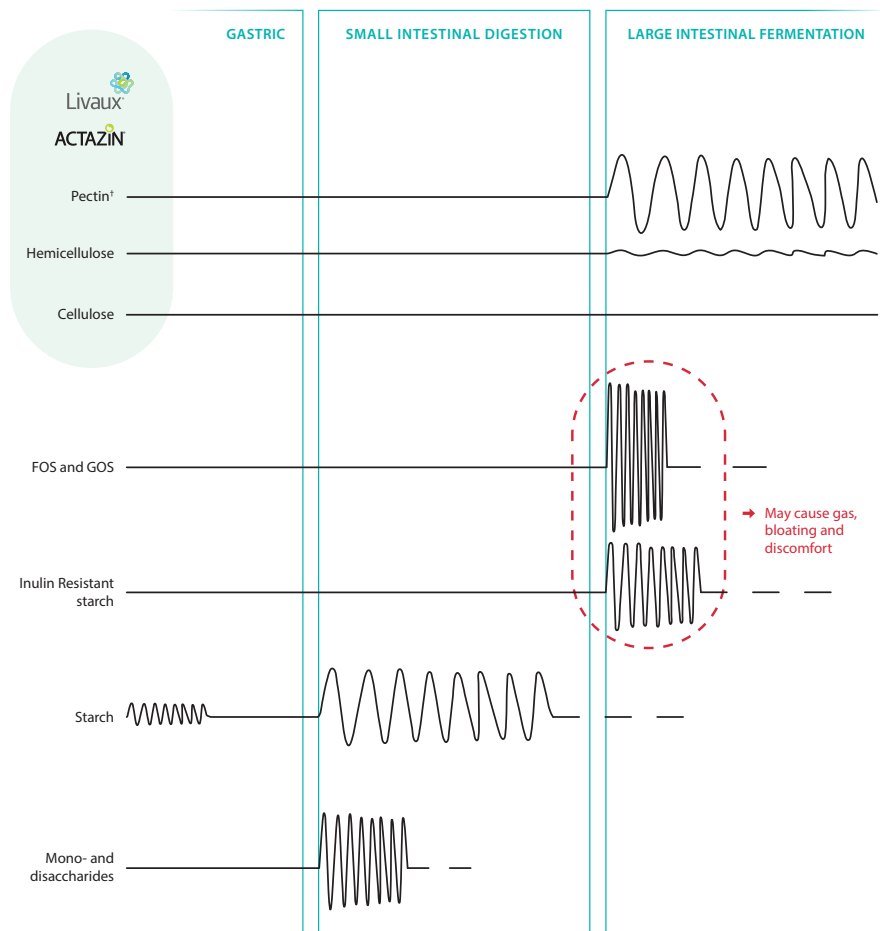
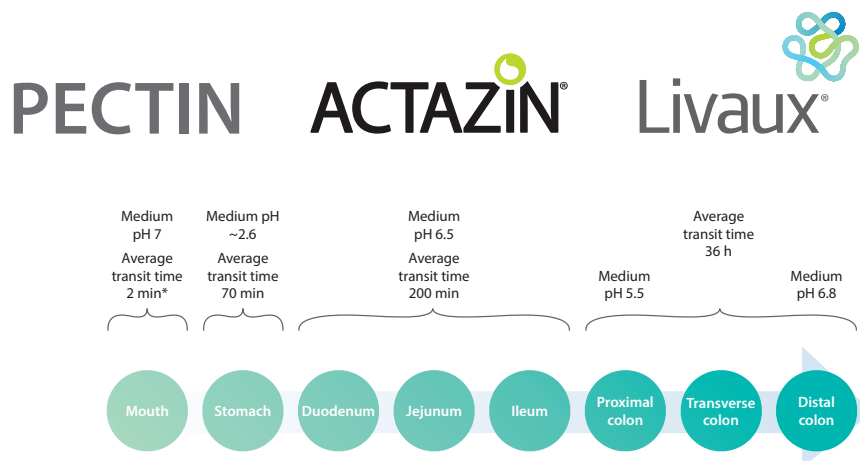
Kiwifruit pectin is more slowly fermented by our colonic bacteria and this happens along the whole length of our colon. As the kiwifruit pectin moves along the colon, different bacteria are able to access newly revealed regions of the kiwifruit pectin molecule as it undergoes consecutive degradation.

### Short chain fatty acids from Actazin® and Livaux®

A slower rate of fermentation means that a greater variety of good bacterial species will grow, leading to a greater diversity of beneficial fermentation by-products produced from Kiwifruit pectin degradation, such as the short chain fatty acids (SCFA) acetate, propionate and butyrate. In contrast, common prebiotics are fermented rapidly and early on in the colon, producing acetate and lactate, and may often cause gas, bloating and discomfort in susceptible individuals.

### Differences between Actazin® and Livaux® kiwifruit pectin

Actazin® from green kiwifruit is concentrated to a ratio of approximately 8 fruit to 1 powder dose. This powder is comprised of about 15% dietary fibre. About 32% of the fibre in green kiwifruit is pectin. This pectin is methyl-esterified to about 65%. Livaux® from gold kiwifruit also has a ratio of approximately 8 fruit to 1 powder dose. This powder is comprised of about 12% dietary fibre. About 36% of the fibre in gold kiwifruit is pectin. This pectin is methyl-esterified to about 59%. The difference in compositions of the kiwifruit powders suggest that Actazin® has more fermentable material, is fermented slower and further along the colon; compared to Livaux® which has less material, less methyl-esterification, and its fermentation potentially occurs slightly faster and earlier in the colon. However, Livaux® also contains more antioxidant vitamin C (ascorbate) and fruit polyphenolics than Actazin®. So, Livaux® provides a slightly more favourable reduction/oxidation (redox) environment for the very oxygen-intolerant, specialist fermentative bacteria residing in our colon, such as *Faecalibacterium prausnitzii*.



\*Lovegrove et al., 2017 Role of polysaccharides in food, digestion and health. Crit Rev Food Sci Nutr. 57 (2): 237-253

Ultimately, kiwifruit pectin from both Actazin® and Livaux® should be completely fermented by the end of their passage through the colon, having conferred their prebiotic benefits along the way.

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