

Feiolix: A Natural GLP-1 Inducer

What is GLP-1

GLP-1 (Glucagon-Like Peptide-1) is a hormone produced in the intestine (by L cells in the lining of the ileum and colon) in response to food. It plays a crucial role in regulating blood sugar levels by stimulating insulin release from the pancreas and inhibiting glucagon release, which helps prevent blood sugar levels from getting too high after eating¹.

Blood Sugar Regulation:

GLP-1 helps lower blood sugar levels after meals by stimulating insulin secretion from pancreatic beta cells and inhibiting glucagon secretion from pancreatic alpha cells.

Appetite Reduction:

GLP-1 also acts on the brain to reduce appetite, promoting a feeling of fullness or satiety after eating. This can potentially help with weight management.

Metabolism Regulation:

GLP-1 slows down gastric emptying, which helps to regulate nutrient absorption and can contribute to a more stable blood sugar response.

Synthetic forms of GLP-1, such as Ozempic/Wegovy (semaglutide), are used as medications to treat type 2 diabetes because of their blood sugar-lowering effects and potential benefits for weight management.

What is Feiolix

Described as tropical and aromatic, with notes of berries, guava, and pineapple, and a pear-like gritty texture, this unique superfruit is beloved by New Zealanders. The complex flavour and texture is influenced by uniquely high concentrations of a universal signalling hormone known as abscisic acid, as well as anti-inflammatory polyphenols and dietary fibre. These components are also the main health promoting compounds in feijoa.

Feiolix is a whole fruit powder (seeds and skins included) that can be used in dietary supplements, functional foods, and beverages.



Absciscic Acid In Feiolix Stimulate GLP-1 Secretion

- Absciscic Acid (ABA) is a universal signaling molecule. ABA is best known as a plant hormone involved in ripening and the separation of fruit from stem. ABA is also expressed in mammalian pancreatic β -cells and other tissues in low concentrations².
- Absciscic acid has been shown to stimulate secretion of native GLP-1 from the pancreas, which as a result of increased binding (of either semaglutide or actual GLP-1) to GLP-1 receptors leads to the same downstream effects of GLP-1: increased insulin secretion and glucose disposal³.

Absciscic Acid Actions



Pancreas

Insulin secretion
GLP-1 secretion
Increases satiety



Brain

Reduces inflammation
Supports thermogenesis
Increases satiety
Reduces neuropathic pain



Adipose Cells

Decreases macrophage infiltration
Reduces inflammation
Improves glucose tolerance



Muscle Cells

Glucose absorption
Glucose utilisation
Increases thermogenesis

Feijoas have the highest concentration of ABA in fruit and vegetables.

Food product	ABA (mg/kg) ₁
NZ Feijoas	4.29
Avocados	2.0
Fig	0.72
Bilberry	0.40
Apricot	0.32
Apple	0.30
Tomato	0.20

Feiolix is a high quality, polyphenolic-rich feijoa fruit powder made entirely from New Zealand feijoa. Feiolix has been tested to contain >4.0 mg/100 g of ABA.

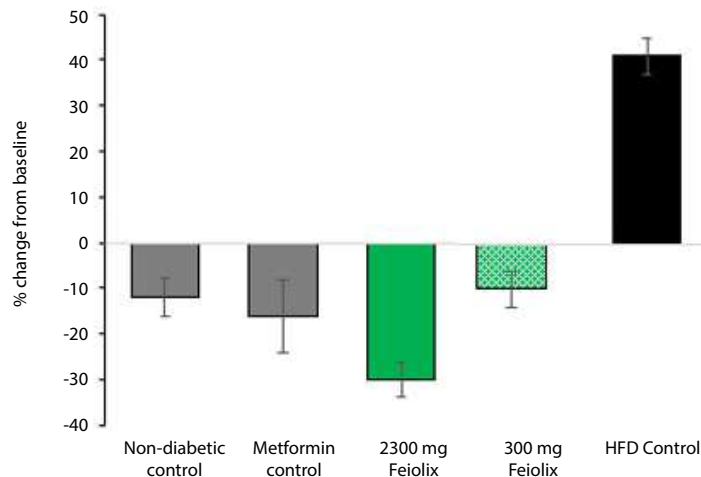


NZ Feijoa has
6x as much
ABA as fig and
2x as much
ABA as
avocados

Feiolix Reduces Blood Glucose with a Low Dose of 300 mg

In a pre-clinical study, mice were placed on a high fat diet and given metformin (a diabetes medication), or Feiolix at different dosages, or a placebo. The results showed that Feiolix at the low dose of 300 mg per day is as effective as metformin at significantly reducing elevated Fasting Blood Glucose, Triglycerides, Total Cholesterol and LDL cholesterol.

Change in Fasting Blood Glucose 8-24 weeks



Over 84 in-vitro, pre-clinical, and clinical studies have linked ABA with glycemic control

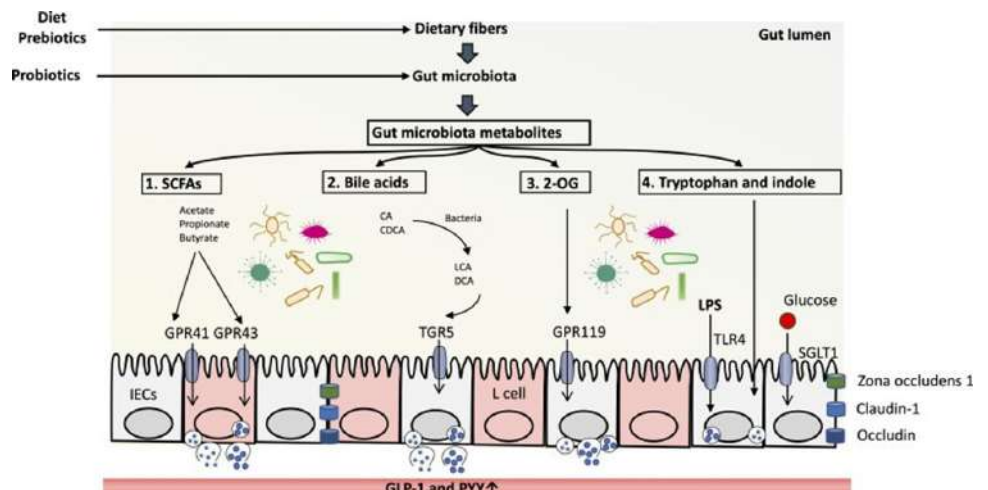
Several other studies have shown that ABA both stimulates glucose uptake and improves glucose tolerance to the same extent as insulin at similar concentrations³. The results from Anagenix's pre-clinical study are likely due to the abscisic acid present in Feiolix in addition to the bioactive polyphenols, and dietary fiber.

A Second GLP-1 Pathway via the Gut Microbiome

Soluble fibre has been shown to increase GLP-1. Dietary fibre and prebiotics escape our own digestive enzymes and travel to the terminal ileum and the colon where they are fermented by members of our gut microbiome. As a consequence of this fermentation and the growth of the bacteria using them, our gut microbiome produces certain byproducts which stimulate GLP-1 and PYY release from our L cells found in the epithelia lining these regions⁴.

Feiolix contains dietary fibres (xyloglucans and xylans) that have been shown to almost exclusively support the growth of Bacteroides species. Bacteroides produce acetate and propionate. These short chain fatty acids (SCFA) trigger the GPR signalling cascades resulting in GLP-1 and PYY secretion. Feijoa plant cell wall polysaccharides (e.g., pectin) and polyphenols (e.g., hydrolysable tannins) are also likely to feed other gut bacteria such as Ruminococcus that produce acetate and butyrate triggering GLP-1 and PYY secretion through the same mechanism.

Bacteroides are also known to metabolize primary bile acids into secondary bile acids, triggering the signalling leading to GLP-1 and PYY secretion.

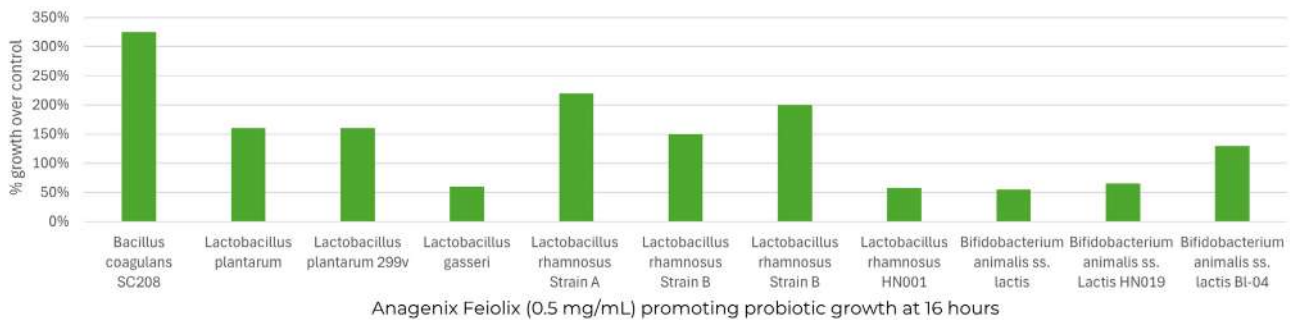


Peptide YY (PYY) is an acute satiety signal that has been clearly linked to feelings of satiety and therefore leading to a decrease in food consumption through the following mechanisms⁵.

- PYY travels through the bloodstream to the brain where it signals that the body is full
- Slows down gastric emptying
- Interacts with other appetite regulating hormones such as inhibiting ghrelin which stimulates hunger

Consumption of dietary fibres has been clearly linked to satiety feelings which can aid in food consumption decrease and weight loss⁵. In a recent synbiotic study with Feiolix, Feiolix promoted the growth of various probiotics by up to over 300% compared to the control.

Synbiotic growth relationship between Feiolix and Probiotic strains



In Summary:

Feiolix contains blood glucose lowering abscisic acid, anti-inflammatory polyphenols, and satiating dietary fibre.

GLP-1 helps reduce weight through blood sugar regulation, appetite reduction, and metabolism regulation. Abscisic acid has been clearly linked to stimulating GLP-1 release.

Feiolix's benefits are likely attributable to:

- High quantities of abscisic acid activating GLP-1 release
- Dietary fibres promoting growth of bacteria within the microbiome to promote GLP-1 secretion and satiety
- Bioactive polyphenols transformed in the gut into urolithins which are anti-inflammatory and insulin secretagogues

Feiolix has been shown to have significant effects on weight loss at a dose of 2300mg/day. Feiolix has also been shown to lower blood glucose and blood lipid levels at a low dose of 300mg/day.

In vivo and clinical studies have shown that Feiolix supports metabolic health by:

- increasing insulin secretion from pancreatic β cells
- enhancing glucose absorption by skeletal muscle cells
- regulating metabolism by decreasing inflammation and increasing GLP-1 secretion
- increasing satiety through improved leptin signaling
- reducing blood triglycerides and LDL cholesterol
- increasing postprandial (post-meal) thermogenesis
- reducing weight gain from a high fat diet

Citations:

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5. Cooper JA. Factors affecting circulating levels of peptide YY in humans: a comprehensive review. *Nutrition Research Reviews*. 2014;27(1):186-197. doi:10.1017/S0954422414000109



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