Award Winning ★★★★★

BrocStar Explains:

Sulforaphane

for WEIGHT LOSS

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Summary of Research & Evidence

Below, we've summarised the key areas of research which are showing promising results for the potential of glucoraphanin & sulforaphane to support weight loss and mitigate the symptoms and complications of obesity, including:

1 REDUCED BODY WEIGHT

Glucoraphanin/sulforaphane rich diets have been found, in both meta-analyses of animal studies,[1] and in epidemiological studies in humans,[2] to reduce body fat.

Weight loss is achieved through numerous complementary pathways including:

- Reducing the deposition of fat and the accumulation of fat cells[3,4,5,6,7,8,9,10]
- Reducing appetite and food intake (through increasing responsiveness to the appetite suppressant hormone leptin)[11,12,13]
- Promoting the burning of fat through increasing mitochondrial production[14] and driving the body to burn fats for energy[15,16]
- Stimulating the conversion of inactive white fat to metabolically-active brown fat, promoting a higher base metabolic rate[17,18,19] – supporting the gut microbiome to increase levels of good bacteria, which improves both fat and glucose metabolism,[20,21] further supporting weight loss

> "Treatment [with sulforaphane] reduces fat deposition in white adipose tissue and liver, decreases proliferation and differentiation of adipocytes, promotes white adipose tissue browning with an increase of energy expenditure, improves insulin sensitivity, reduces inflammation and decreases food intake."
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> *Review: Mechanisms Underlying Biological Effects of Cruciferous Glucosinolate-Derived Isothiocyanates/Indoles: A Focus on Metabolic Syndrome (Esteve. Front Nutr. - 2020)*

Through reducing fat deposition, suppressing appetite, promoting fat burning and browning, and increasing levels of good bacteria in the gut, these natural molecules can help to prevent weight gain and support weight loss.

2 REDUCED INSULIN RESISTANCE

Administering glucoraphanin/sulforaphane in animal studies has been found to ameliorate glucose intolerance and insulin resistance,[13,22,23] via enhancing glucose uptake our of the blood and into muscles.[26]

This is supported by human studies which show that glucoraphanin/sulforaphane can support improved insulin sensitivity and healthier blood sugar levels, both in people who are overweight and diabetic,[24,25,26] as well as those of a healthy weight.[27]

> "Sulforaphane acts as a promising agent to improve glucose tolerance through up-regulation of insulin signaling."
>
> *Sulforaphane ameliorates glucose intolerance in obese mice via upregulation of insulin signaling pathway (Xu et al, 2018)*

These natural molecules therefore offer promise to those wishing to lose weight, not just in terms of supporting fat loss but also in terms of preventing conditions associated with excessive body fat such as insulin resistance and diabetes.

For more detail on the potential benefits of glucoraphanin/sulforaphane in diabetes, see our dedicated 'Sulforaphane & Blood Sugar Explained' document.

3 REDUCED INFLAMMATION

Being overweight is associated with chronic systemic inflammation, which drives a wide range of diseases and negative health impacts. Human, animal, and in vitro studies have indicated that as well as reducing body weight, liver fat, and 'bad' cholesterol levels, glucoraphanin/sulforaphane can soothe this chronic inflammation, through:

- Reducing levels of pro-inflammatory molecules (such as IL-6 and C-reactive protein[28] and IL-1β and TNF-α in the blood[29]
- Modulating the response of immune cells to suppress their production of pro-inflammatory molecules[32,33]
- Reducing levels of harmful gut bacteria which release inflammation-inducing lipopolysaccharides (LPS)[18,20,21,27]
- Increasing levels of good gut bacteria that promote gut integrity and prevent these harmful lipopolysaccharides (LPS) from entering the blood[20,21]

> "Sulforaphane modulates inflammatory responses in immune cells and may play a role in reducing systemic inflammation in obesity."
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> *Sulforaphane reduces pro-inflammatory response to palmitic acid in monocytes and adipose tissue macrophages (Williams et al, 2022)*

This means that these natural molecules can reduce the systemic inflammation caused by excess body fat and, therefore, reduce the risk of conditions associated with increased inflammation including cardiovascular disease, diabetes, and metabolic syndrome.

4 HEALTHIER CHOLESTEROL LEVELS

Human trials have shown that administering glucoraphanin/sulforaphane results in reductions in 'bad' cholesterol (LDL) levels,[32,33] and increases 'good' cholesterol (HDL) levels[25] by promoting cellular metabolic activity and suppressing lipid and cholesterol synthesis.[24]

> "Evidence from two independent human studies indicates that consumption of high glucoraphanin broccoli significantly reduces plasma LDL-C."
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> *Diet rich in high glucoraphanin broccoli reduces plasma LDL cholesterol: Evidence from randomised controlled trials (Armah et al. Mol Nutr Food Res, 2015)*

This indicates that through modulating lipid and cholesterol levels in the blood, these natural molecules may reduce the risk of cardiovascular events such as heart attacks that are associated with obesity and high 'bad' cholesterol levels.

5 ALLEVIATION OF METABOLIC NON-ALCOHOLIC FATTY LIVER DISEASE (ALSO KNOWN AS HEPATIC STEATOSIS)

Animal and in-vitro studies have shown that glucoraphanin/sulforaphane both can prevent and reverse excessive fat build up in the liver (a condition commonly associated with obesity and commonly responsible for liver damage) by increasing energy expenditure and fat metabolism,18 and preventing fat deposition in the liver:[2,30,31]

> "Notably, the anti-obesity agents sulforaphane and glucoraphanin prevent hepatic steatosis by increasing energy utilization and preventing lipogenesis and oxidative stress in the liver."
>
> *Impact of Glucoraphanin-Mediated Activation of Nrf2 on Non-Alcoholic Fatty Liver Disease with a Focus on Mitochondrial Dysfunction (Xu et al. Int J Mol Sci, 2019)*

Through preventing the development of a fatty liver, these natural molecules can help to minimise the destructive impact of obesity and promote healthy liver function.

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BrocStar for Weight Loss

Glucoraphanin is a natural molecule found in some plants - most notably broccoli. When these plants are eaten, glucoraphanin is converted into its active form - called sulforaphane - which is then absorbed by our gut. Sulforaphane then enters our cells and exerts several different metabolic effects, which together serve to boost our production of antioxidants, reduce inflammation, and improve our cell's ability to function, produce energy and repair damage.

BrocStar (also known as Grextra) is our super-strain of broccoli, which is a powerful source of sulforaphane. For more details, including biological mechanisms of action, see our Guide to BrocStar

Due to the effects of sulforaphane in our cells, it has been extensively researched for its beneficial effects on human health across a range of different areas - including supporting weight loss. Studies indicate that adding more sulforaphane to our diet could act through several different mechanisms to encourage the body to lay down less fat and burn up existing fat deposits as well as reducing appetite and food intake, leading to reduced body weight.

Adding more sulforaphane to our diet has also been shown in studies to help alleviate many of the negative consequences of obesity, including fatty liver disease, high cholesterol, and chronic inflammation.

> "Sulforaphane is a prime candidate (for) use against a preoccupying condition rampaging through mainly developed countries: obesity and its associated complications."
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> *Review: Three in One: The Potential of Brassica By-Products against Economic Waste, Environmental Hazard, and Metabolic Disruption in Obesity (Castelão-Baptista et al, 2021)*

Together, these effects make glucoraphanin a valuable dietary nutrient for people looking to support their weight loss efforts and mitigate the impact of obesity on their health and wellbeing.

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About BrocStar SuperSoup

BrocStar SuperSoup is a unique delivery vector for glucoraphanin. It's made using a unique glucoraphanin-rich broccoli called BrocStar (also known as GRextra) that developed over decades, is backed by patented research from the Quadram Institute and clinical trials run with Norfolk NHS hospitals, supported by public research grants from Innovate UK.

Just one bowl of BrocStar SuperSoup contains a once-weekly dose of glucoraphanin - the equivalent of eating 5 heads of raw broccoli or taking 14 tablets of a leading glucoraphanin supplement. This makes it the most powerful, convenient and cost-effective solution on the market for adding glucoraphanin to your diet.

BrocStar SuperSoup is also rich in fibre and Vitamins C & B6, calcium and folic acid, which together also contribute to maintaining a healthy metabolism, bone health, energy production, the reduction of fatigue and maintaining a healthy immune system - all of which are all crucial for athletes looking to perform at their best.

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