

Dr. Fuhrman®

PRODUCT FACTS

GLUCOSE BIOTECT

Glucose Biotect contains a carefully selected combination of essential micronutrients and effective plant extracts.

NATURAL BLOOD SUGAR SUPPORT

The Nutritarian eating style, as described in **The End of Diabetes**, helps to normalize blood glucose levels by focusing on antioxidant-rich, high fiber, whole plant foods. Glucose Biotect provides extra assistance for those who require it. Glucose Biotect contains a carefully selected combination of essential micronutrients and effective plant extracts.¹

CINNAMON EXTRACT

Numerous human trials suggest that supplemental cinnamon powder and cinnamon extract support healthy blood glucose levels.¹ The bark of cinnamon trees contains phytochemicals that research suggests enhance insulin signaling and facilitate cellular glucose uptake and storage.

Multiple species of evergreen trees belong to the cinnamon family. The most common culinary cinnamon is *Cassia cinnamon*, and this is the cinnamon powder that has most often been used in glucose-management trials. The major drawback to using a high dose of *Cassia cinnamon* is the presence of coumarin, a substance which may damage the liver. Powdered cinnamon supplements are known to contain amounts of coumarin that may approach the maximum recommended daily dose.¹ Although no adverse effects have been reported in glucose-lowering trials, I have chosen not to use *Cassia cinnamon* in Glucose Biotect as a safety precaution. Ceylon cinnamon ("true" cinnamon) is preferable to *Cassia* for culinary uses because of its more complex flavor and the absence of coumarin. For

the safest and most effective source of supplemental cinnamon, a purified cinnamon extract is utilized, which is designed to concentrate the effective phytochemicals and exclude the coumarin.

ORGANIC ALOE VERA

Aloe barbadensis, the aloe vera plant, is a succulent which grows in dry environments. The plant stores water in a gel inside its leaves. Aloe vera gel has been used for medicinal purposes – primarily for the skin – as far back as ancient Greece. Aloe vera gel contains vitamins, minerals, plant sterols, antioxidants and anti-inflammatory compounds. According to animal studies, phytochemical compounds found in aloe vera leaf gel may affect blood glucose levels. Human clinical trials are still in preliminary stages with published trials showing positive results.²



GLUCOSE BIOTECT

Product Features

- 100% vegan
- Cinnamon extract, which may support healthy glucose levels
- Thiamin and chromium, which help produce energy from glucose
- Extracts of organic aloe vera, organic ginger, white mulberry leaf, banaba leaf, gymnema leaf and fenugreek seed
- Manufactured by a GMP certified and FDA-regulated facility
- No gluten-containing ingredients
- Non-GMO



Glucose Biotect contains extracts of white mulberry leaf, banana leaf, gymnema leaf and fenugreek seed.

ORGANIC GINGER

The ginger root is commonly used as a spice or herbal tea throughout the world. Unique phytochemicals called gingerols are thought to be the major bioactive compounds in ginger. In vitro studies have shown that gingerols or ginger extracts inhibit carbohydrate digestion enzymes and enhance glucose uptake in muscle cells.³

Several randomized controlled trials have suggested ginger supplementation helps to normalize blood glucose levels. The studies have generally used ginger powder, which may have varying levels of the relevant phytochemicals. Plus the studies have used a variety of doses, so the evidence is still preliminary, and further studies will be required.^{4,5}

THIAMIN

Thiamin is one of the B vitamins (vitamin B1) and plays an important role as a cofactor in the chemical reactions of glucose metabolism and insulin production.⁶ It is common for people with diabetes to excrete too much thiamin via the kidneys, which puts them at risk of deficiency. Thiamin deficiency can exacerbate diabetes symptoms, since thiamin is important for glucose metabolism and insulin production. Furthermore, thiamin deficiency over time may damage the arterial walls and promote the dangerous complications of diabetes, including neuropathy, nephropathy and retinopathy.⁷ Consequently, it is imperative for those with diabetes to maintain adequate thiamin levels; however, the amount obtained from foods and multivitamin supplements may not be enough. A higher dose of thiamin than that generally recommended by the Institute of Medicine is likely required for people with diabetes, to counteract the increased thiamin losses. High-dose thiamin supplements are available, but those excessive doses are not necessary on a Nutritarian program. A conservative dose of thiamin is included in Glucose Biotect, in order to prevent deficiency without unnecessary levels of supplementation.

CHROMIUM

Chromium is an essential mineral, and similar to thiamin, it is an important cofactor in the chemical reactions that produce energy from glucose. In addition, chromium enhances insulin signaling, allowing insulin to efficiently transport glucose from the bloodstream into the body's cells. The standard American diet, which is rich in refined carbohydrates, promotes chromium loss, and it is common for people with diabetes to have lower chromium levels than healthy individuals. High-dose chromium supplementation has been shown to reduce fasting blood glucose and HbA1C levels for people with diabetes.⁸ However, switching to a Nutritarian eating style will help to normalize chromium intake and reduce chromium loss. As with thiamin, excessively high doses are not required to maintain adequacy and allow for the proper functioning of chromium in the body. A conservative dose of chromium is included in Glucose Biotect as chromium picolinate, which is more absorbable than other forms.⁹ This level of supplementation is designed to protect against deficiency while avoiding excess.

ADDITIONAL PLANT EXTRACTS

Glucose Biotect contains extracts of white mulberry leaf, banana leaf, gymnema leaf and fenugreek seed. The leaves of the mulberry tree are the preferred food of silkworms, while the berries are often eaten by humans. Banana is a common ornamental tree grown in Asia. Gymnema is a large, woody plant that grows indigenously in India, Africa, and Australia. Fenugreek is a deep yellow seed used as a spice in the cuisines of India and North Africa. Although effective doses have not been established and further research is necessary, preliminary studies suggest that these plant extracts may have glucose-balancing properties.¹⁰⁻¹³

1. Davis PA, Yokoyama W. **Cinnamon intake lowers fasting blood glucose: meta-analysis.** *J Med Food* 2011; 14:884-889.
2. Devaraj S, Yimam M, Brownell LA, et al. **Effects of Aloe vera supplementation in subjects with prediabetes/metabolic syndrome.** *Metab Syndr Relat Disord* 2013; 11:35-40.
3. Li Y, Tran VH, Duke CC, Roufogalis BD. **Preventive and Protective Properties of Zingiber officinale (Ginger) in Diabetes Mellitus, Diabetic Complications, and Associated Lipid and Other Metabolic Disorders: A Brief Review.** *Evid Based Complement Alternat Med* 2012; 2012:516870.
4. Zhu J, Chen H, Song Z, Wang X, Sun Z. **Effects of Ginger (Zingiber officinale Roscoe) on Type 2 Diabetes Mellitus and Components of the Metabolic Syndrome: A Systematic Review and Meta-Analysis of Randomized Controlled Trials.** *Evid Based Complement Alternat Med* 2018; 2018:5692962.
5. Huang FY, Deng T, Meng LX, Ma XL. **Dietary ginger as a traditional therapy for blood sugar control in patients with type 2 diabetes mellitus: A systematic review and meta-analysis.** *Medicine (Baltimore)* 2019; 98:e15054.
6. Page GL, Laight D, Cummings MH. **Thiamine deficiency in diabetes mellitus and the impact of thiamine replacement on glucose metabolism and vascular disease.** *Int J Clin Pract* 2011; 65:684-690.
7. Thornalley PJ. **The potential role of thiamine (vitamin B1) in diabetic complications.** *Curr Diabetes Rev* 2005; 1:287-298.
8. Via M. **The malnutrition of obesity: micronutrient deficiencies that promote diabetes.** *ISRN Endocrinol* 2012; 2012:103472.
9. Lamson DW, Plaza SM. **The safety and efficacy of high-dose chromium.** *Altern Med Rev* 2002; 7:218-235.
10. Mudra M, Ercan-Fang N, Zhong L, et al. **Influence of mulberry leaf extract on the blood glucose and breath hydrogen response to ingestion of 75 g sucrose by type 2 diabetic and control subjects.** *Diabetes Care* 2007; 30:1272-1274.
11. Stohs SJ, Miller H, Kaatz GR. **A review of the efficacy and safety of banana (Lagerstroemia speciosa L.) and corosolic acid.** *Phytother Res* 2012; 26:317-324.
12. Leach MJ. **Gymnema sylvestre for diabetes mellitus: a systematic review.** *J Altern Complement Med* 2007; 13:977-983.
13. Ceballos WT, Stephens JM, Ribnicky DM. **Diabetes and Herbal (Botanical) Medicine.** In *Herbal Medicine: Biomolecular and Clinical Aspects 2nd edition*. Edited by Benzie IFF, Wachtel-Galer S. Boca Raton, FL: CRC Press; 2011.

GLUCOSE BIOTECT

Supplement Facts

Recommended Use: Take 1-2 capsules three times daily. Best taken with meals.

Supplement Facts		
Serving Size: 2 Capsules	Servings Per Container: 90	
	Amount Per Serving	% Daily Value
Thiamin (as thiamin HCl)	10 mg	833%
Chromium (as chromium picolinate)	40 mcg	114%
Ginger root extract (5% gingerols)	400 mg	*
Aloe vera leaf gel extract	200 mg	*
Cinnamon bark proprietary extract (Cinnulin PF®)	166 mg	*
Proprietary Blend:	300 mg	*
Mulberry leaf extract, gymnema leaf extract, banana leaf extract (<i>Lagerstroemia speciosa</i>) and fenugreek seed extract		

* Daily value not established.

Store at 15-30°C (59-86°F). Protect from heat, light and moisture. Do not purchase if seal is broken. Keep out of reach of children.

Cinnulin PF® is a registered trademark of Integrity Nutraceuticals, Inc. US Patent # 7,504,118



These supplements have not been evaluated by the Food and Drug Administration.

Products listed are not intended to diagnose, treat, cure or prevent disease.

Caution: If pregnant, nursing or on medication, consult with your healthcare practitioner.

For more detailed information about this supplement, visit <http://www.drfuhrman.com/shop/247/biotect-line>