

DIAXINOL



CLINICAL APPLICATIONS

- Provides Key Nutrients for Blood Sugar Regulation
- Helps Maintain Healthy Blood Sugar Levels
- Supports Normal Cellular Metabolism

AdvancedResearchWellness.com

Tel: (717) 733-2080

BLOOD SUGAR SUPPORT

Diaxinol is a natural and synergistic formula for maintaining balanced blood sugar. Through enhanced signaling at the cellular level, Diaxinol's blend of natural extracts and vitamins support healthy blood glucose levels. Diaxinol's unique and effective formulation contains five ingredients provided at targeted doses for maximum efficacy. Alpha lipoic acid (ALA) is a potent antioxidant that supports insulin regulation, glucose utilization, and cellular metabolism. Cinnulin®, a patented 20:1 aqueous cinnamon extract, supports both balanced glucose metabolism and healthy blood lipid levels. Chromium is added to support glucose tolerance factor (GTF) production, a critical component in cellular uptake of glucose. Vanadyl sulfate and biotin are also included to increase insulin sensitivity and support metabolic efficiency.

Overview

Maintaining healthy blood sugar (glucose) levels can often pose a challenge because, on average, Americans spend 21 hours a day being sedentary.¹ Additionally, we consume foods that are highly processed, refined, and contain excessive levels of sugar while offering very little in the way of micronutrients and fiber.² Combining these lifestyle practices with genetic predisposition and high stress patterns make it very difficult to maintain adequate blood sugar levels. Healthy blood sugar regulation is a complex process that requires a number of metabolic factors working at optimal capacity. Part of this process includes a region in the pancreas called the Islets of Langerhans. This region has various types of cells involved in regulating blood sugar levels. If blood glucose levels fall (which often occurs due to stress or lack of food intake for an extended period of time), the alpha cells of this region

secrete *glucagon*, a hormone that triggers the release of stored glucose (glycogen) from the liver and skeletal muscles. Conversely, when blood sugar levels are elevated, beta cells in the Islets of Langerhans secrete the hormone insulin. Insulin causes liver cells, muscle cells and fat cells to take up glucose from the bloodstream. The delicate balance of blood sugar levels is crucial for regulating the body's production of energy. Micronutrients such as chromium, biotin and vanadyl sulfate are required to support enzymatic reactions and cellular signaling systems that maintain the body's homeostasis. Diaxinol's blend of ingredients helps support the body's glucose and lipid-regulating mechanisms in order to help optimize energy expenditure and fuel storage mechanisms.

Alpha Lipoic Acid[†]

Alpha lipoic acid (ALA) is a nutrient required for cellular metabolism, specifically the breakdown of carbohydrates and fatty acids.³ ALA has been shown to support healthy blood sugar balance by activating an enzyme called adenosine mono-phosphate kinase (AMPK), a major regulator of cellular energy.⁴ AMPK coordinates both long-term and short-term metabolic changes, leading to an improvement in energy production and a reduction of energy storage.⁵ AMPK activates cellular metabolism by improving insulin sensitivity, down-regulating genes involved in fat storage and activating genes involved with burning fat.⁶ A study using a dose of 600 mg/day of ALA over three months demonstrated that ALA helps support healthy lipid levels while improving oxidative stress (reducing free radical damage) by 38%.⁵ An additional study examining the effects of ALA on 74 subjects found that within the four-week, placebo-controlled trial, administration of 600 mg of ALA per day significantly enhanced glucose transport

† These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

EFFICACY
the power of *e*

and utilization.⁷ ALA is also a potent antioxidant. It scavenges free radicals while aiding in the regeneration of the body's antioxidants including vitamin C, vitamin E and glutathione.⁸ Through its antioxidant-boosting mechanisms, ALA helps maintain healthy blood vessel and circulatory health.

Cinnulin® (Cinnamon Bark Extract)†

Numerous studies have demonstrated that cinnamon has a beneficial effect on maintaining healthy blood sugar levels. Cinnamon acts by inhibiting several enzymes that play a role in insulin resistance leading to an increase in insulin sensitivity.^{9,10} Diaxinol contains Cinnulin®, which is made using a patented process that extracts the water-soluble components of cinnamon into a potent 20:1 extract (500 mg of Cinnulin® is equivalent to approximately 10 g of whole cinnamon powder). Cinnulin® is standardized to contain doubly-linked polyphenol type A polymers, the bioactive component which has been shown to be effective in clinical trials. In a study examining the effects of Cinnulin®, 24 men and women were given 250 mg of Cinnulin®, or placebo, twice per day. Cinnulin® helped to maintain healthy blood sugar levels in 83% of subjects in the treatment group, compared to 33% in the placebo group.¹¹ Cinnulin® has also been shown to support healthy body composition by increasing lean body mass while reducing body fat.¹¹ An additional study examined the effects of 6 g of cinnamon on glucose levels in subjects consuming 50 g of carbohydrates (instant farina cereal). The researchers found that the addition of cinnamon to cereal helped to improve glucose response measurements during the 15, 30, 45 and 60 minutes following the carbohydrate challenge.¹²

Chromium†

Chromium is a critical piece in the molecule glucose tolerance factor (GTF), a complex shown to be crucial for the uptake of glucose into the cells.^{13,14} Studies using 1000 mcg/day of chromium have demonstrated that chromium helps maintain healthy blood sugar balance, insulin sensitivity and blood lipids.¹⁵ In a study examining the effects of nutrients on blood sugar and lipid regulation, 43 patients were given 600 mcg of chromium along with 2 mg of biotin per day, or placebo. After four weeks, the combination of chromium and biotin was found to have a significant effect on supporting healthy blood sugar balance, while helping to maintain healthy triglyceride and high-density lipoprotein (HDL) cholesterol levels in the treatment group.¹⁶

Biotin†

Biotin is a B vitamin that plays a major role in energy production by acting as a coenzyme for several carboxylase enzymes involved in the metabolism of fatty acids and amino acids.^{17,18} Biotin also plays numerous roles in maintaining healthy blood sugar balance such as, stimulating glucose-induced insulin secretion, enhancing insulin sensitivity and

accelerating glucose metabolism in the liver and pancreas.¹⁹ Biotin also activates glucokinase, a critical enzyme involved in glucose utilization.²⁰ Additional research has found that biotin supplementation increases the number of insulin secreting beta cells in the pancreas.²¹

Vanadyl Sulfate†

Vanadyl sulfate (VS) is the stable, inorganic form of vanadium, a mineral shown to mimic the action of insulin. VS plays a major role in promoting healthy glucose uptake by stimulating Akt.²² This causes subsequent activation of GLUT4, the insulin regulated glucose transporter. In a three-week study, VS given at 100 mg/day significantly improved insulin sensitivity.²³ VS was also shown to decrease glucose production by about 20%. An additional study using 100 mg per day of VS for three weeks also demonstrated an improvement in insulin sensitivity while helping to maintain healthy glucose levels.²⁴

Directions

2 capsules per day or as recommended by your health care professional.

Does Not Contain

Gluten, corn, yeast, artificial colors and flavors.

Cautions

If you are pregnant or nursing, consult your physician before taking this product.

Supplement Facts ^{v3}		
Serving Size 2 Capsules		
Servings Per Container 30 & 60		
2 capsules contain	Amount Per Serving	% Daily Value
Biotin USP	3,000 mcg	1,000%
Chromium (as O-polynicotinate)†	800 mcg	667%
Alpha Lipoic Acid	400 mg	*
Cinnamon Bark Extract (Cinnulin®)	150 mg	*
Vanadyl Sulfate Hydrate	50 mg	*
* Daily Value not established		

ID# 544060 60 Capsules

ID# 544120 120 Capsules

† These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

References

1. Hamilton MT, Healy GN, Dunstan DW, Zderic TW, Owen N. Too little exercise and too much sitting: Inactivity physiology and the need for new recommendations on sedentary behavior. *Current cardiovascular risk reports*. 2008;2:292-298.
2. Yang EJ, Kerver JM, Park YK, Kayitsinga J, Allison DB, Song WO. Carbohydrate intake and biomarkers of glycemic control among us adults: The third national health and nutrition examination survey (nhanes iii). *The American Journal of Clinical Nutrition*. 2003;77:1426-1433.
3. Shay KP, Moreau RF, Smith EJ, Smith AR, Hagen TM. Alpha-lipoic acid as a dietary supplement: Molecular mechanisms and therapeutic potential. *Biochimica et Biophysica Acta (BBA)-General Subjects*. 2009;1790:1149-1160.
4. Lee WJ, Song K-H, Koh EH, Won JC, Kim HS, Park H-S, Kim M-S, Kim S-W, Lee K-U, Park J-Y. A-lipoic acid increases insulin sensitivity by activating ampk in skeletal muscle. *Biochemical and biophysical research communications*. 2005;332:885-891.
5. Ruderman NB, Carling D, Prentki M, Cacicedo JM. Ampk, insulin resistance, and the metabolic syndrome. *The Journal of Clinical Investigation*. 2013;123:2764-2772.
6. Towler MC, Hardie DG. Amp-activated protein kinase in metabolic control and insulin signaling. *Circulation research*. 2007;100:328-341.
7. Jacob S, Ruus P, Hermann R, Tritschler H, Maerker E, Renn W, Augustin H, Dietze G, Rett K. Oral administration of rac- α -lipoic acid modulates insulin sensitivity in patients with type-2 *diabetes mellitus*: A placebo-controlled pilot trial. *Free Radical Biology and Medicine*. 1999;27:309-314.
8. Packer L, Witt EH, Tritschler HJ. Alpha-lipoic acid as a biological antioxidant. *Free Radical Biology and Medicine*. 1995;19:227-250.
9. Qin B, Nagasaki M, Ren M, Bajotto G, Oshida Y, Sato Y. Cinnamon extract prevents the insulin resistance induced by a high-fructose diet. *Hormone and metabolic research*. 2004;36:119-125.
10. Sheng X, Zhang Y, Gong Z, Huang C, Zang YQ. Improved insulin resistance and lipid metabolism by cinnamon extract through activation of peroxisome proliferator-activated receptors. *PPAR research*. 2008;2008.
11. Ziegenfuss TN, Hofheins JE, Mendel RW, Landis J, Anderson RA. Effects of a water-soluble cinnamon extract on body composition and features of the metabolic syndrome in pre-diabetic men and women. *Journal of the International Society of Sports Nutrition*. 2006;3:45.
12. Magistrelli A, Chezem JC. Effect of ground cinnamon on postprandial blood glucose concentration in normal-weight and obese adults. *Journal of the Academy of Nutrition and Dietetics*. 2012;112:1806-1809.
13. Doisy R, Streeten D, Freiberg J, Schneider A. Chromium metabolism in man and biochemical effects. *Trace Elements in Human Health and Disease*. 2013;2:79-104.
14. Mertz W. The interaction between chromium and insulin. *Nutrition, Digestion, Metabolism: Proceedings of the 28th International Congress of Physiological Sciences, Budapest, 1980*. 2013:101.
15. Anderson RA, Cheng N, Bryden NA, Polansky MM, Cheng N, Chi J, Feng J. Elevated intakes of supplemental chromium improve glucose and insulin variables in individuals with type 2 diabetes. *Diabetes*. 1997;46:1786-1791.
16. Morris B, MacNeil S, Hardisty C, Heller S, Burgin C, Gray T. Chromium homeostasis in patients with type ii (niddm) diabetes. *Journal of Trace Elements in Medicine and Biology*. 1999;13:57-61.
17. Kim K-H. Regulation of mammalian acetyl-coenzyme a carboxylase. *Annual Review of Nutrition*. 1997;17:77-99.
18. Baumgartner E, Suormala T. Multiple carboxylase deficiency: Inherited and acquired disorders of biotin metabolism. *International journal for vitamin and nutrition research. Internationale Zeitschrift fur Vitamin-und Ernährungsforschung. Journal international de vitaminologie et de nutrition*. 1996;67:377-384.
19. Albarracin CA, Fuqua BC, Evans JL, Goldfine ID. Chromium picolinate and biotin combination improves glucose metabolism in treated, uncontrolled overweight to obese patients with type 2 diabetes. *Diabetes/metabolism research and reviews*. 2008;24:41-51.
20. Spence JT, Koudelka A. Effects of biotin upon the intracellular level of cgmp and the activity of glucokinase in cultured rat hepatocytes. *The Journal of Biological Chemistry*. 1984;259:6393-6396.
21. Matschinsky FM. Regulation of pancreatic β -cell glucokinase from basics to therapeutics. *Diabetes*. 2002;51:S394-S404.
22. Bhuiyan MS, Shioda N, Fukunaga K. Targeting protein kinase b/akt signaling with vanadium compounds for cardioprotection. *Expert opinion on therapeutic targets*. 2008;12:1217-1227.
23. Cohen N, Halberstam M, Shlimovich P, Chang CJ, Shamooh H, Rossetti L. Oral vanadyl sulfate improves hepatic and peripheral insulin sensitivity in patients with non-insulin-dependent *diabetes mellitus*. *The Journal of Clinical Investigation*. 1995;95:2501.
24. Halberstam M, Cohen N, Shlimovich P, Rossetti L, Shamooh H. Oral vanadyl sulfate improves insulin sensitivity in niddm but not in obese nondiabetic subjects. *Diabetes*. 1996;45:659-666.