



Cinnamon:

A Supplement for Diabetes, Body Composition, Cardiovascular Health & Antioxidant Protection

©2009 Huntington College of Health Sciences

Literature Education Series On Dietary Supplements

By Gene Bruno, MS, MHS

Smart Supplementation™ is a free series of educational literature created by Huntington College of Health Sciences (HCHS) as a public service. Although copyrighted, it may be freely photocopied and distributed, but may not be altered in any way. Smart Supplementation™ is not intended as medical advice. For diagnosis and treatment of any medical condition, consult your physician.

Don't you just love the smell and taste of cinnamon in a warm, gooey cinnamon bun? As it turns out, the cinnamon may actually provide you with some significant health benefits (although the same can't be said of the gooey bun; sorry). So let's take a closer look at cinnamon.

Background

The use of cinnamon for health is not new. In fact, cinnamon bark has been used for several thousand years in traditional Eastern and Western systems of medicine, for such purposes as anorexia, bloating, dyspepsia with nausea, flatulent colic, and spastic conditions of the GI tract.¹ Cinnamon also has a history of traditional use in Korea, China and Russia for treating people with diabetes.²

So what is it about cinnamon that gives it these medicinal properties? The answer is its natural constituents. Specifically, it is the volatile oils (such as eugenol and cinnamaldehyde) as well as the phenolic compounds (such as polyphenol type-A polymers).^{3 4}

Modern research

In addition to traditional use, modern research has demonstrated a number of benefits resulting from cinnamon supplementation. These include improvements in blood sugar for type 2 diabetics, improvements in body composition (e.g., increased lean mass), improvements in cardiovascular parameters, and substantial antioxidant properties. Following is a brief overview of this research.

Improvements in blood sugar

In research by Khan et al⁵, subjects with type 2 diabetes who took 1, 3 or 6 grams of cinnamon per day for 40 days lowered fasting blood sugar by 18% to 29%. The highest dose produced the most rapid response; although the lowest dose produced the most sustained response over the course of the study.

A more recent placebo-controlled, double-blind study⁶ was conducted on 79 patients with type 2 diabetes mellitus. Subjects were given 336 mg daily of a water-soluble cinnamon extract (corresponding to 3 g of cinnamon powder) or a placebo for 4 months. Those using the cinnamon experienced a significant 10.3% reduction in fasting blood sugar, compared to a non-significant 3.4% reduction in the placebo group.

In a placebo-controlled, double-blind study by Ziegenfuss et al⁷, 21 adults with

metabolic syndrome (i.e., prediabetes) were given a water-soluble cinnamon extract (500 mg per day) or a placebo for 12 weeks. The results were that 83% of those given the extract experienced a significant decrease (about 8%) in fasting blood sugar, compared to only 33% in the placebo group who experienced a decrease.

Improvements in body composition

In the aforementioned study by Ziegenfuss et al⁸, the subjects also experienced a significant alteration in body composition. Their body fat decreased by 0.7%, and their muscle mass increased by 1.1%. These changes took place without alterations in the diet or physical activity of the subjects.

Improvements in cardiovascular parameters

In the previously cited study by Khan et al⁹, type 2 diabetics who were given 1, 3 or 6 grams of cinnamon a day for 60 days experienced significant drops in triglycerides (23% to 30%), low-density lipoprotein (LDL) cholesterol (7% to 27%), and total cholesterol (12% to 26%).

In the Ziegenfuss et al¹⁰ study, cinnamon resulted in a 3.8% reduction in systolic blood pressure. Likewise, other research¹¹ demonstrated that cinnamon was able to reduce systolic blood pressure in spontaneously hypertensive rats.

Substantial antioxidant properties

As stated previously, cinnamon contains polyphenols. This is important since polyphenols are potent antioxidant compounds which can help to reduce the oxidative damage caused by free radicals.¹² According to Webb¹³, a recent study assessed antioxidant status and oxidative damage in 11 obese, prediabetic subjects given a water-soluble cinnamon extract, compared to 10 obese, prediabetic subjects given a placebo. Those who received the cinnamon experienced a 14% reduction in markers of oxidative damage, as well as an increase in markers of total antioxidant capacity.

Safety

When used orally and appropriately, cinnamon is a safe supplement.¹⁴ As a matter of fact, cinnamon has Generally Recognized as Safe (GRAS) status in the United States.¹⁵ In pregnancy, cinnamon is likely safe when consumed in amounts commonly found in foods¹⁶, but may not be safe when used orally in amounts greater than those found in foods.¹⁷

Dosage

Based upon the research discussed, an appropriate dose of cinnamon would range between 500-3000 mg daily.

References

- ¹ Blumenthal M, Goldberg A, Brinckmann J (eds). *Herbal Medicine: Expanded Commission E Monographs*. Newton, MA: Integrative Medicine Communications; 2000.
- ² Kim SH, Hyun SH, Choung SY. Anti-diabetic effect of cinnamon extract on blood glucose in db/db mice. *Journal of Ethnopharmacology* 2006 104:119-123.
- ³ Blumenthal M, Goldberg A, Brinckmann J (eds). *Herbal Medicine: Expanded Commission E Monographs*. Newton, MA: Integrative Medicine Communications; 2000.
- ⁴ Webb D. A scientific review: Cinnamon and its role in diabetes. Sarasota, FL: Integrity Nutraceuticals International; n.d.
- ⁵ Khan A, Safdar M, Ali Khan M, et al. Cinnamon improves glucose and lipids of people with type 2 diabetes. *Diabetes Care* 2003; 26:3215-8.
- ⁶ Mang B, Wolters M, Schmitt B, Kelb K, Lichtinghagen R, Stichtenoth DO, Hahn A. Effects of a cinnamon extract on plasma glucose, HbA_{1c}, and serum lipids in diabetes mellitus type 2. *European Journal of Clinical Investigation* 2006; 36:340-344
- ⁷ 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(2):45-53.
- ⁸ 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(2):45-53.
- ⁹ Khan A, Safdar M, Ali Khan M, et al. Cinnamon improves glucose and lipids of people with type 2 diabetes. *Diabetes Care* 2003; 26:3215-8.

¹⁰ 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(2):45-53.

¹¹ Preuss HG, Echard B, Polansky MM, Anderson R. Whole Cinnamon and Aqueous Extracts Ameliorate Sucrose-Induced Blood Pressure Elevations in Spontaneously Hypertensive Rats. *Journal of the American College of Nutrition* 2006; 25(2):144-150.

¹² Shobana S, Naidu KA. Antioxidant activity of selected Indian spices. *Prostaglandins Leukot Essent Fatty Acids* 2000; 62(2):107-110.

¹³ Webb D. A scientific review: Cinnamon and its role in diabetes. Sarasota, FL: Integrity Nutraceuticals International; n.d.

¹⁴ McGuffin M, Hobbs C, Upton R, Goldberg A, eds. *American Herbal Products Association's Botanical Safety Handbook*. Boca Raton, FL: CRC Press, LLC 1997.

¹⁵ FDA. Center for Food Safety and Applied Nutrition, Office of Premarket Approval, EAFUS: A food additive database. Available at: vm.cfsan.fda.gov/~dms/eafus.html.

¹⁶ FDA. Center for Food Safety and Applied Nutrition, Office of Premarket Approval, EAFUS: A food additive database. Available at: vm.cfsan.fda.gov/~dms/eafus.html.

¹⁷ McGuffin M, Hobbs C, Upton R, Goldberg A, eds. *American Herbal Products Association's Botanical Safety Handbook*. Boca Raton, FL: CRC Press, LLC 1997.



For more than two decades, Huntington College of Health Sciences (HCHS) has offered more than a conventional undergraduate or graduate education. Our accredited*, distance learning degrees and diploma programs also include the breadth of responsible complementary and alternative medicine viewpoints, providing our students with a well-rounded and comprehensive approach to nutrition and the health sciences:

- Master of Science in Nutrition
- Bachelor of Health Science in Nutrition
- Associate of Science in Applied Nutrition
- Diploma in Comprehensive Nutrition
- Diploma in Dietary Supplement Science
- Diploma in Sports Nutrition
- Diploma in Women's Nutrition
- Diploma in Natural Sciences
- Diploma in Small Business Management

1204D Kenesaw
Knoxville, TN 37919
865-524-8079 • 800-290-4226
E-Mail: studentservices@hchs.edu
www.hchs.edu

*Accredited member Distance Education & Training Council.