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**File: ■ Cinnamon (*Cinnamomum* spp.)**  
**■ Blood Glucose**  
**■ Blood Sugar**

**HC 061161-428**

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**RE: Meta-analysis Demonstrates that Cinnamon Lowers Fasting Blood Glucose**

Davis PA, Yokoyama W. Cinnamon intake lowers fasting blood glucose: meta-analysis. *J Med Food*. April 2011; [epub ahead of print]. doi:10.1089/jmf.2010.0180.

Cinnamon (*Cinnamomum* spp.) bark has been used around the world as a spice and also in traditional Chinese medicine. Cinnamon bark contains a high amount of the broadly bioactive and antioxidant compounds known as procyanidins. Cinnamon preparations have been well-studied for their ability to lower fasting blood glucose (FBG) concentrations and for its impacts on insulin concentrations and signaling, both important metabolic parameters in the assessment of type 2 diabetes mellitus (T2DM). Previous meta-analyses conducted on this research have concluded that such research is inconclusive or reported no significant effects; however, since these meta-analyses were published, 3 new clinical studies with large populations and/or long treatment periods have been completed. As a result, this paper consists of a meta-analysis of the effect of cinnamon on FBG including the new papers.

To obtain studies, the search terms used were "cinnamon" and "glucose" in addition to related words. Databases searched included Biosis, PubMed, and 2010 abstracts for the American Diabetes Association and the Federation of American Societies for Experimental Biology. The authors included randomized, placebo-controlled studies that reported results of long-term use of cinnamon bark powder or cinnamon bark extract on FBG.

The search yielded 8 clinical studies that met the inclusion criteria. Seven used *C. aromaticum* syn. *C. cassia*, and one did not report the species used. Four studies tested cinnamon or cinnamon extract on T2DM patients, 2 studies included patients with impaired FBG, 1 study involved patients with metabolic syndrome and prediabetes, and 1 study tested healthy subjects. Of the 5 studies that used cinnamon extract, 3 mention using an aqueous extract, while 1 used CinSulin® (an aqueous extract manufactured by Tang-An Medical in Beijing, China). The cinnamon extract used in the other 2 studies is not defined. The duration of treatments ranged from 5.5 to 16 weeks, and the dosages of cinnamon or cinnamon extract varied widely from 500 mg to 9 g daily. The number of

patients or subjects in each clinical study was between 20 and 136 people with 5 studies having 20-25 subjects.

The results of the meta-analysis show that cinnamon and cinnamon extract supplementation significantly lowered FBG ( $-0.49 \pm 0.2$  mmol/L [ $8.77 \pm 3.52$  mg/dL],  $P=0.025$ ,  $n=8$ ). Cinnamon extract alone also significantly lowered FBG ( $-0.48 \pm 0.17$  mmol/L [ $8.7 \pm 3.10$  mg/dL],  $P=0.008$ ,  $n=5$ ). Funnel plot analysis revealed only limited publication bias.

The authors conclude that, "The results of [this] meta-analysis show that the intake of cinnamon/cinnamon extract by type 2 diabetics or prediabetics does lower their blood glucose significantly, albeit modestly." Although the hypoglycemic activity of cinnamon is comparable with metformin, the conventional pharmaceutical drug frequently prescribed for patients with T2DM), more mechanistic work is needed to definitively use cinnamon alongside this drug for diabetes therapy. Furthermore, no distinction was made concerning the type of extracts used in the studies. Water extracts may be preferable since they exclude nonpolar compounds with known toxicity (the newly included studies used a water extract of cinnamon).

—Amy C. Keller, PhD

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