Cognitive Vitality Reports® are reports written by neuroscientists at the Alzheimer's Drug Discovery Foundation (ADDF). These scientific reports include analysis of drugs, drugs-in-development, drug targets, supplements, nutraceuticals, food/drink, non-pharmacologic interventions, and risk factors. Neuroscientists evaluate the potential benefit (or harm) for brain health, as well as for age-related health concerns that can affect brain health (e.g., cardiovascular diseases, cancers, diabetes/metabolic syndrome). In addition, these reports include evaluation of safety data, from clinical trials if available, and from preclinical models.

Cinnamon

Evidence Summary

Cinnamon may have utility in lowering blood glucose and blood pressure, and may improve lipid profiles. There is no solid evidence for use as a cognitive enhancer or for cognitive impairment / dementia.

Neuroprotective Benefit: Preclinical studies suggest that cinnamon may have neuroprotective activities and may improve cognitive function in animal models. It is unknown whether cinnamon has any effect on human cognitive function.

Aging and related health concerns: Evidence suggests that in patients with metabolic disorders, cinnamon may lower blood glucose and blood pressure, and may improve lipid profiles. These effects may be modest.

Safety: Food additive cinnamon has GRAS status as per the FDA. Many studies have tested up to 6 g/day and reported GI disturbance or allergic reactions as adverse events, if any. Serious liver toxicity is possible at very high doses and/or in at-risk groups.

Availability: In food or as a supplement	**Dose**: Cinnamon is taken orally in diet or as a supplement. The most effective dose is not known. Most trials have used between 1 and 6 grams a day.	**Compounds:** Cinnamaldehyde, eugenol, and polyphenols, including catechin and EGCG among other polyphenols and compounds
Half-life: Varies based on compound; 2 to 5 minutes for cinnamaldehyde, 2 to 6 hours for EGCG, 14 hours for eugenol	**BBB**: Varies based on compound; at least some compounds, including cinnamaldehyde, eugenol, and EGCG are penetrant	
Clinical trials: The largest meta-analysis of RCTs included 6,208 individuals	**Observational studies**: The largest observational study identified included 93 individuals	

What is it?

Cinnamon is the generic term for a commercial spice and is extracted from the inner bark of several tree species in the genus *Cinnamomum*. There are more than 200 members in the Cinnamomum genus, but most commercial cinnamon is obtained from *Cinnamomum verum / Cinnamomum zeylanicum* (known colloquially as Ceylon cinnamon or 'true cinnamon'), *C. burmannii* (Indonesian cassia), *C. loureiroi* (Saigon or Vietnamese cinnamon), and *C. cassia* (Chinese cinnamon) (Momtaz et al., 2018).

The bark is typically used in stick form or as a ground powder and is often used as a spice for food and drinks. Cinnamon is generally regarded as safe as per the FDA when consumed as a food additive. Cinnamon can also be found as a supplement or essential oil. The primary constituent of cinnamon is a compound known as cinnamaldehyde. There are many other chemical entities found in cinnamon, including eugenol, cinnamic acid, and polyphenols, including catechins. The relative quantities of these compounds can vary across species; for instance, *C. cassia* has much higher levels of coumarin compared to *C. verum* (Momtaz et al., 2018).

Beyond its culinary uses, cinnamon has been used in traditional herbal medicine and has been suggested to have a variety of potential health benefits. Cinnamon is thought to have anti-inflammatory,

antioxidant, and anti-microbial properties. Much of the research into cinnamon has focused on its effect on metabolic diseases, with a particular focus on type 2 diabetes (Gou et al., 2025). Some research suggests that cinnamon may lower blood sugar, improve lipid profiles, and reduce blood pressure (Guo et al., 2025).

Neuroprotective Benefit: Preclinical studies suggest that cinnamon may have neuroprotective activities and may improve cognitive function in animal models. It is unknown whether cinnamon has any effect on human cognitive function.

Types of evidence:

- 2 systematic reviews
- 1 clinical trial
- 1 observational study
- 3 reviews
- Multiple laboratory studies

Human research to suggest prevention of dementia, prevention of decline, or improved cognitive function:

It is not known whether cinnamon improves cognitive function, prevents decline, or prevents dementia.

No trial published has looked at the impacts of cinnamon use on incidence of dementia. There is extremely limited information on whether cinnamon affects cognitive function in any group. Nakhaee et al., 2024 describes a systemic review that includes two small clinical trials investigating the effects of cinnamon on cognitive function. One reported an improvement in scores on tests of memory on the PGI memory scale in adolescent students who chewed cinnamon gum twice a day for 15 days compared to those who did not. The study was small with just 15 students per arm and had a variety of limitations; it is not clear that it received peer review. Another study of adults 60 years or older randomized 48 participants with prediabetes to receive one dose of turmeric, cinnamon, or both, and then tested their working memory over the course of 6 hours. There was no change in working memory in those who received cinnamon.

Aside from its use as a supplement or food additive, cinnamon has also been explored as a component of olfactory training. Olfactory training is often used for olfactory dysfunction, but has been explored for use in cognitive function, including in normosmic populations (Vance et al., 2024). A small 16-week open-label trial investigated olfactory training in 60 patients with type 2 diabetes and MCI. The participants were randomized to receive exposure to six odorants, including cinnamon, twice daily, or receive standard care. At the end of the trial, patients who received olfactory training had significantly improved global cognition scores as measured by MoCA (p=0.001) compared to patients in the control group (Chao et al., 2025). This trial has several confounders and cinnamon was just one of several odorants. Therefore, it is not possible whether the cognitive improvement is attributed to the olfactory training itself or to one or a combination of the odorants.

There is a dearth of observational studies assessing the association, if any, between cinnamon and cognitive function. A cross-sectional study reported that in adults 60 years and older with prediabetes, people who ingested cinnamon had better working memory scores than those who did not use cinnamon (p<0.001). The study was small (n=93) and subject to the confounders inherent in an observational study (Wahlqvist et al., 2016). No other observational study for cinnamon and any aspect of cognition was identified.

Human research to suggest benefits to patients with dementia:

There are no publications on the effects, if any, of cinnamon in patients with dementia.

Mechanisms of action for neuroprotection identified from laboratory and clinical research:

Preclinical studies have suggested that cinnamon and/or its constituent compounds have beneficial effects in models of AD, but no human studies have explored whether these results are translational. The mechanisms of action identified in preclinical studies in rodents and cell culture include protection against Aβ and tau phosphorylation / pathology (Frydman-Marom et al, 2011; Kim et al, 2007; Guo et al, 2010; Yoshida et al, 2011; George et al, 2013; Peterson et al, 2009), inhibition of toxicity from advanced glycation end products (Peng et al, 2010), inhibition of microglia (McCarty et al, 2006), and reduced oxidative stress (Jain et al, 2014). A 2018 review included these papers and other studies that suggested that cinnamon and/or its components may have acetylcholinesterase inhibitor activity, reduced neuroinflammation, and improvements in learning and memory in animal models (Momtaz et al., 2018). A systematic review of preclinical animal work also reported improvements in cognitive function and/or

neuronal deficits in animal models of AD after administration of cinnamon or compounds in cinnamon. The systematic review also included a report of attenuated cognitive and neuronal loss after cinnamon administration in traumatic brain injury models (Nakhaee et al., 2024). Administration of oral cinnamon also reduced α-synuclein pathology in a mouse model of Parkinson's disease (PD) (Raha et al., 2021). The doses that might lead to these results in humans have not been determined.

Cinnamon may also have indirect neuroprotective effects. Diabetes, hypertension, and high LDL-c are all risk factors for dementia (Livingston et al., 2024), and as some evidence suggests that cinnamon may lower blood glucose levels, blood pressure, and LDL-c, cinnamon could be neuroprotective in part or in whole by mitigating these risk factors.

APOE4 interactions:

No published research has examined the use of cinnamon in regard to the APOE4 genotype.

Aging and related health concerns: Evidence suggests that in patients with metabolic disorders, cinnamon may lower blood glucose and blood pressure, and may improve lipid profiles. These effects may be modest.

Types of evidence:

- 4 umbrella reviews of meta-analyses
- 5 meta-analyses or systematic reviews
- 1 network meta-analysis
- 5 clinical trials

DIABETES: POSSIBLE BENEFIT

Cinnamon may improve metabolism and cardiovascular health in patients with type 2 diabetes (T2D). A 2025 umbrella review assessed meta-analyses of RCTs in patients with metabolic disease. It should be noted that this paper refers to the intervention as 'cinnamon supplementation' but this term encompasses both dietary supplements and the culinary spice. The review included a total of 21 meta-analyses; most were in patients with T2D. The RCTs tested doses ranging from 0.12 to 6 grams per day and lasted from 1.5 to 12 months The authors found that evidence was "highly suggestive" that cinnamon supplementation had beneficial effects on fasting blood glucose; the pooled analysis indicated

a significant reduction (SMD=-0.61; 95% CI -0.70 to -0.52). These benefits were more pronounced with doses of more than 1.5 grams per day. There were trends towards improvement in $HbA1_c$ and HOMA-IR, but the evidence for these outcomes was considered "weak" and the results were non-significant (Guo et al., 2025). This umbrella review also explored cardiovascular benefits, which will be discussed below.

A comparative effectiveness network meta-analysis assessed the effectiveness of six herbs on glycemic control. The herbs included cinnamon, ginger, fenugreek, cumin, saffron, and garlic, and the authors also considered onions, black seed, fennel, peppermint, apple cider vinegar, and parsley. The researchers analyzed 44 trials enrolling a total of 3,130 participants with type 2 diabetes and reported that cinnamon significantly reduced fasting blood glucose compared to placebo, but that cinnamon did not significantly reduce $HbA1_c$. Cinnamon ranked second in terms of standardized mean difference; only apple cider vinegar outranked cinnamon (Kumar et al., 2023).

A systematic review not included in the above umbrella review assessed 45 studies of cinnamon using a ranking system to assess bias and study quality. They found that after using their ranking system, approximately 50% of the assessed studies found a significant improvement in at least one parameter of blood glucose control. They concluded that cinnamon supplementation likely has a 'modest positive effect' on blood glucose (Bakhach et al., 2024)

Several RCTs have been published after the meta-analyses included in Guo et al., 2025. These studies also report reductions in fasting blood glucose in the group receiving cinnamon compared to placebo (Muthukuda et al., 2025; Ranasinghe et al., 2025). A study in patients with prediabetes and obesity also reported better glycemic control in patients receiving cinnamon supplements in comparison to those receiving placebo (Zelicha et al., 2024). The highest dose of cinnamon in these studies was 4 grams per day, and all studies reported no serious adverse events and no significant differences between groups.

Cardiovascular disease: POSSIBLE BENEFIT

An umbrella review of meta-analyses by Guo et al., 2025 included 21 meta-analyses of RCTs in patients with metabolic disorders. The researchers reported that compared to placebo, cinnamon supplementation may result in modest to moderate improvements in cholesterol, triglycerides, and LDL-c, but the evidence was graded as 'weak' or 'suggestive'. Greater improvements in cholesterol and triglyceride levels were associated with higher doses of more than 1.5 grams per day. The analyses also indicated that cinnamon has a moderate-to-strong effect on lowering both systolic and diastolic blood pressure, though the evidence was graded as 'weak'. Interestingly, for this outcome, there was a greater reduction in diastolic blood pressure with doses of 1.5 grams or less per day.

Sarmadi et al., 2023 also performed an umbrella review of meta-analyses of RCTs testing cinnamon compared to placebo or control. They included 11 meta-analyses assessing the impacts of cinnamon on lipid profile, oxidative stress, and inflammation biomarkers in adults. The researchers report that compared to placebo or control, cinnamon use could significantly improve total cholesterol (WMD=-1.01 mg/dL; 95% CI -2.02 to -0.00, p=0.049), LDL-c (WMD=-0.82 mg/dL; 95% CI -1.57 to -0.07, p=0.032), and HDL-c levels (WMD=0.47 mg/dL; 95% CI 0.17 to 0.77, p=0.002). They did not observe any significant difference in levels of triglycerides or C-reactive protein, though they did observe an enhanced total antioxidant capacity in cinnamon users with T2D compared to those who did not receive cinnamon. The researchers also reported that their subgroup analysis suggested that *C. verum* but not *C. cassia* improved lipid profile.

Zhang et al., 2024 describes a very similar umbrella review to that of Sarmadi et al., 2023. Zhang and colleagues also included 11 meta-analyses of RCTs and assessed the impact of cinnamon supplementation on blood pressure, oxidative stress, and inflammatory biomarkers. They report that those who received cinnamon had lower systolic (ES=-2.36 mm Hg; 95% CI -3.86 to -1.40) and diastolic blood pressure (ES=-1.65 mm Hg; 95% CI -2.41 to -0.90) compared to placebo or control. They also reported a lower total antioxidant capacity in those who received cinnamon compared to those who did not, though they found no differences in C-reactive protein levels.

There are other meta-analyses that were not included in the above umbrella reviews.

Jafari et al., 2025 published a GRADE assessed systematic review and meta-analysis of RCTs of cinnamon supplementation on risk factors for cardiovascular disease. They included 49 studies of adults with various health conditions. Cinnamon doses ranged from 120 mg / day to 12 grams per day. The analyses indicated that compared to those receiving placebo, participants receiving cinnamon had significant reductions in systolic (SMD=-0.85; 95% CI -1.54 to -0.16) and diastolic blood pressure (SMD=-1.04; 95% CI -1.54 to -0.55), total cholesterol (SMD=-1.15; 95% CI -1.55 to - 0.75), LDL-c (SMD=-0.71; 95% CI -1.02 to -0.40), and triglycerides (SMD=-0.91; 95% CI -1.25 to -0.56), and had an increase in HDL-c levels (SMD=0.56; 95% CI 0.23 to 0.89). Subgroup analyses indicated that doses above 2 grams per day and dosing of more than 8 weeks were associated with larger treatment effects, and younger patients had greater benefits. However, the authors cautioned that many of the included studies were of poor quality and that their findings should be interpreted with caution.

Krittanawong et al., 2022 performed a systematic review and meta-analysis of clinical trials and reported that cinnamon consumption was not associated with any significant changes in LDL-c or HDL-c compared to participants who did not consume cinnamon. The systematic review and meta-analysis of 10 RCTs by

Fateh & Amin, 2024 similarly found no significant differences between the cinnamon and control group in terms of levels of total cholesterol, LDL-c, or HDL-c, though they did see significant reductions in LDL-c in participants who received 0.5 grams or less per day of cinnamon. They also observed a significant reduction in triglycerides in the cinnamon group compared to the placebo group, especially in participants who received less than 0.5 grams per day of cinnamon. These meta-analyses were smaller than the above umbrella reviews, but larger, longer studies of the same formulation of cinnamon could shed light on some of the discrepancies between works.

The effects of cinnamon on lipid profile may have implications for other conditions including metabolic dysfunction-associated steatotic liver disease (MASLD) (Zhang et al., 2023) and obesity. Cinnamon may also modestly reduce BMI and body weight (Keramati et al., 2022). These effects are statistically significant but small in magnitude; cinnamon may have utility as a complement to other weight loss strategies.

Safety: Food additive cinnamon has GRAS status as per the FDA. Many studies have tested up to 6 g/day and reported GI disturbance or allergic reactions as adverse events, if any. Serious liver toxicity is possible at very high doses and/or in at-risk groups.

Types of evidence:

- 1 umbrella review of meta-analyses and systematic reviews
- 3 case reports
- 2 FDA documents

As a food additive and at doses typical of food consumption, cinnamon has a 'generally regarded as safe' (GRAS) rating as per the FDA (Nakhaee et al., 2024). Evidence suggests that doses up to 6 grams are typically well tolerated; higher doses have been linked to mainly mild gastrointestinal adverse events or skin reactions (Guo et al., 2025) and tended to be self-limited (Hajimonfarednejad et al., 2019).

An umbrella review of meta-analyses of RCTs in patients with metabolic disease included 21 meta-analyses. The RCTs tested doses ranging from 0.12 to 6 grams per day and lasted from 1.5 to 12 months. The researchers reported that only one meta-analysis reported on adverse events with use of cinnamon; the meta-analysis reported that there was no difference in adverse events between the cinnamon supplementation and placebo groups (RR=0.83; 95% CI 0.22 to 3.07). The adverse events

reported in the group receiving cinnamon were one case of rash and one of hives (Guo et al., 2025).

Gu et al., 2023 describes an umbrella review assessing the safety of cinnamon in RCTs. The researchers included 3 meta-analyses and 1 systematic review; all meta-analyses were included in Guo et al., 2025. Gu et al., 2023 also found that there were no significant differences in adverse events or toxicities between groups that received cinnamon or placebo, regardless of dose or duration.

Some individuals are or can develop allergies to cinnamon. Hypersensitivity reactions such as contact dermatitis or mouth sores from exposure to cinnamon or use of products containing cinnamon have been documented. These reactions are not common (MSKCC).

Cinnamon products have been recalled for lead contamination (FDA). Coumarin content is also a potential concern at too high doses; it has been connected to hepatotoxicity, bleeding risks, and has been suggested to be a potential carcinogen (Guo et al., 2025).

While cinnamon is considered safe at acceptable doses, more research is needed as to what timeframe and doses can lead to toxicities.

Drug interactions:

The herb-drug interactions of cinnamon are poorly understood. Preclinical research and mechanistic work suggests that cinnamon could have additive effects if taken with other drugs that can be hepatotoxic (Drugs.com); there have been case reports of hepatitis in people taking cinnamon supplements and statins (Brancheau et al., 2015; Odish et al., 2019). As cinnamon may lower blood sugar, it also may have additive effects when used in combination with medications that lower blood sugar (examine.com). Coumarin, one component of some types of cinnamon, is a precursor to oral anticoagulants like warfarin. It is possible that high doses of coumarin in cinnamon could have additive interactions with blood thinners based on lab studies and case reports (Maadarani et al., 2019). Animal studies suggest that there is a potential for fetal malformations with use of cinnamaldehyde.

These interactions are thought to be present at supplemental doses that exceed that of typical dietary intake (examine.com).

Research underway:

There are approximately 20 ongoing trials that involve cinnamon that are registered on clinicaltrials.gov; these trials are for various health conditions, including metabolic syndromes, PCOS, and as a component for olfactory training for adults with olfactory dysfunction. One trial is assessing cognitive function.

NCT06889961 is an ongoing RCT that aims to enroll 50 adults ages 50 to 80 with typical age-related cognitive decline. The researchers will randomize the patients to receive either placebo or a spice mixture that includes cinnamon, turmeric, oregano, black pepper, sage, and thyme. Participants will take one capsule once daily by mouth for 3 months and will be followed for an additional 3 months. The primary outcome is the change in verbal episodic memory at 6 months. Other outcome measures include assessments of executive function, language, working memory, sleep quality, quality of life, diet, body composition, and biomarkers such as blood antioxidant capacity, plasma inflammatory panel, fecal microbiome, and mitochondrial function in blood. The trial is expected to be completed in early 2027.

Search terms:

Pubmed, Google: cinnamon

- Alzheimer's disease, dementia, cognition, cognitive function, diabetes, cardiovascular disease, safety, anticoagulant

Websites visited for cinnamon:

- Clinicaltrials.gov
- Examine.com
- Drugs.com
- WebMD.com
- MSKCC
- PubChem: Cinnamaldehyde; Eugenol; EGCG
- DrugBank.ca: Cinnamon; Cinnamaldehyde; Eugenol; EGCG
- ConsumerLab.com

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