



Think. Focus. Citicoline.

Ingredient Overview

Cognizin®

For the evolution of your mind®

Cognizin® Science Snapshot

What is citicoline?



A naturally occurring nutrient found in the brain.

What does it do?



Citicoline increases an important substance in the brain called phosphatidylcholine that is critical for healthy brain function.

What is Cognizin® Citicoline?



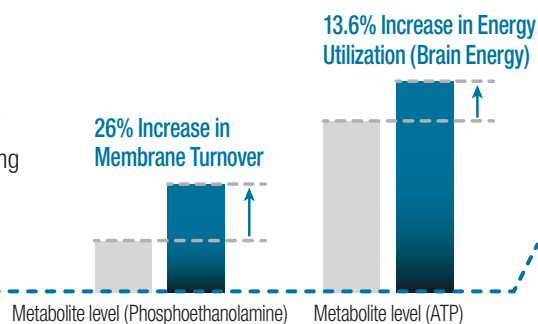
A clinically tested form of citicoline that can supply your brain with the nutrition it needs to stay sharp.

Key studies that show Cognizin® Citicoline's support of focus and attention*

Cognizin® Citicoline's effect on cellular synthesis and brain energy

Researchers observed increases in brain activity among middle-aged adults who had taken 500mg Cognizin® for six weeks*¹

■ Placebo ■ 6 weeks@500 mg/day Cognizin®



Cognizin® increased the formation of brain membranes by 26% and restored brain energy by 13.6%.*

Cognizin® Citicoline's effect on focus and attention

Cognizin® at 250mg / day improves attention and focus in middle-aged women*²

■ Placebo ■ 4 weeks@250 mg/day Cognizin®

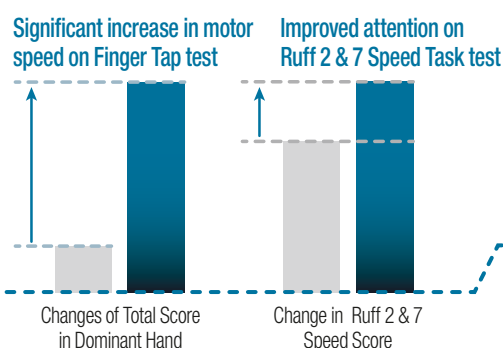


Women taking 250mg of Cognizin® Citicoline experienced fewer omission and commission errors compared to placebo.*

Cognizin® Citicoline's effect on motor speed and attention in adolescent males

Researchers observed an increase in both attention and psychomotor speed in adolescent males after 28 days of Cognizin® supplementation*³

■ Placebo ■ 28 days@250 mg or 500 mg/day Cognizin®



Adolescent males taking 250mg or 500mg of Cognizin® exhibited improved attention and a significant increase in psychomotor speed compared to placebo.*

1. Silveri MM et al. Citicoline enhances frontal lobe bioenergetics as measured by phosphorus magnetic resonance spectroscopy. NMR Biomed. 2008; 21(10):1066-75.
 2. McGlade E. et al. Improved Attentional Performance Following Citicoline Administration in Healthy Adult Women. Food and Nutrition Sciences. 2012;3:769-773.
 3. Yurgelun-Todd D et al. The Effect of Citicoline Supplementation on Motor Speed and Attention in Adolescent Males. Journal of Attention Disorders. 2015; 1557-1246.

*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.

Cognizin's Scientific Advantages

The cognitive health supplement category has seen tremendous growth over the past decade. While an aging population looks for products that support memory and mental acuity, younger consumers want support to help them stay sharp and focused.

Cognizin® Citicoline is a clinically researched brain health ingredient that's been shown to:

1. Support Mental Energy*
2. Promote Focus and Attention*
3. Support Overall Cognitive Health*
4. Support Memory*

What is Cognizin?

Cognizin is a branded form of Citicoline, a substance found in every cell of the body and especially vital to brain health.* Citicoline is broken down during intestinal absorption and, after passing through the blood/brain barrier, is reconstituted in the brain as citicoline.* Citicoline is a water-soluble compound that:

- Supplies precursors for the synthesis of phospholipids, including phosphatidylcholine, a major constituent of brain tissue*
- Helps maintain normal levels of acetylcholine, a chemical that regulates cognitive function*
- Promotes communication between neurons*
- Protects neural structures from free radical damage*
- Supports healthy brain activity and metabolism*
- Helps sustain healthy cellular mitochondria to support cognitive health and energy*
- Supports memory*

The brain's energy consumption

The brain makes up only two percent of a person's body weight, yet it consumes roughly 20 percent of the body's energy when at rest. Cognizin® helps supply the nutrition that the human brain needs to stay alert and focused throughout the entire day.



Cognizin and energy

Energy reserves play a critical role in healthy brain function. The first vital benefit of Cognizin Citicoline is its ability to help support the brain's energy producing centers.* While the brain makes up only two percent of a person's body weight, it consumes roughly 20 percent of the body's energy when at rest. When performing difficult mental activities, the brain needs even more energy. Clinical research indicates that citicoline supports the health of mitochondria, the powerhouses within cells that actually produce the brain's energy.* Healthy mitochondrial function results in higher levels of ATP—the body's main energy storage molecule—in brain cells.

Cognizin and focus

The second brain-health benefit of Cognizin Citicoline is that it promotes focus and concentration.* The ability to focus requires:

1. An adequate ongoing supply of energy
2. Healthy communication between neurons

Not only does Cognizin support healthy brain metabolism, but it also aids in neural communication by protecting neural structures against free radical damage and by facilitating the transmission of information through healthy cell membranes.* To function optimally, cell membranes need adequate levels of phospholipids. Phospholipids are a combination of lipids (fats) and the mineral phosphorus that line cell membranes and help determine what is allowed in and out of the cell. Cognizin is a water-soluble compound essential for the synthesis of phosphatidylcholine, the phospholipid that makes up approximately 30 percent of brain tissue. By increasing the body's supply of these essential phospholipids, Cognizin supports healthy brain activity.*



Cognitive health

Cognizin Citicoline is often called a "brain nutrient" because it increases levels of several important neurotransmitters, including acetylcholine, an important brain chemical that regulates cognitive function. Cognizin has also been shown to support the activity of nerves that respond to acetylcholine, helping to raise activity levels in the brain's learning and communication circuits.*

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Cognizin's Marketing Advantages

Cognizin® is easy to use

Manufacturers and formulators will love the more practical benefits of Cognizin. This ingredient is:

- **Pure.** Cognizin contains no food additives, artificial flavors or preservatives.
- **Stable.** Cognizin is stable in liquids and to high heat.
- **Water-soluble.** Water-soluble Cognizin is easy to use in beverages and liquids.
- **Neutral in taste.** Cognizin's neutral and slightly acidic taste compliments numerous product flavors.
- **GRAS.** Cognizin achieved self-affirmed GRAS status in 2009 and is considered safe for food and beverage applications.
- **Vegetarian.** No animal origin material is used in Cognizin.
- **Allergen-free.** Cognizin is considered allergen-free.
- **Kosher.** Cognizin is a certified Kosher ingredient.
- **Fermentation.** Cognizin is produced by an innovative fermentation process.

Cognizin is backed by Kyowa

Kyowa is an international health ingredient manufacturer and a world leader in the development, manufacturing and marketing of nutraceuticals, pharmaceuticals and food products. Part of Kyowa's dedication to ongoing scientific research, quality management and consumer education, the Cognizin® brand leads the way in clinical brain research. Cognizin is backed by:

- Patents approved and patents pending
- Clinical studies published in peer-reviewed journals
- Self-affirmed GRAS status
- Increased consumer awareness

Kyowa is committed to supplying the following marketing support for Cognizin:

- Co-branding program
- Trade education (manufacturers and healthcare professionals)
- Tradeshow events and lectures
- Consumer education

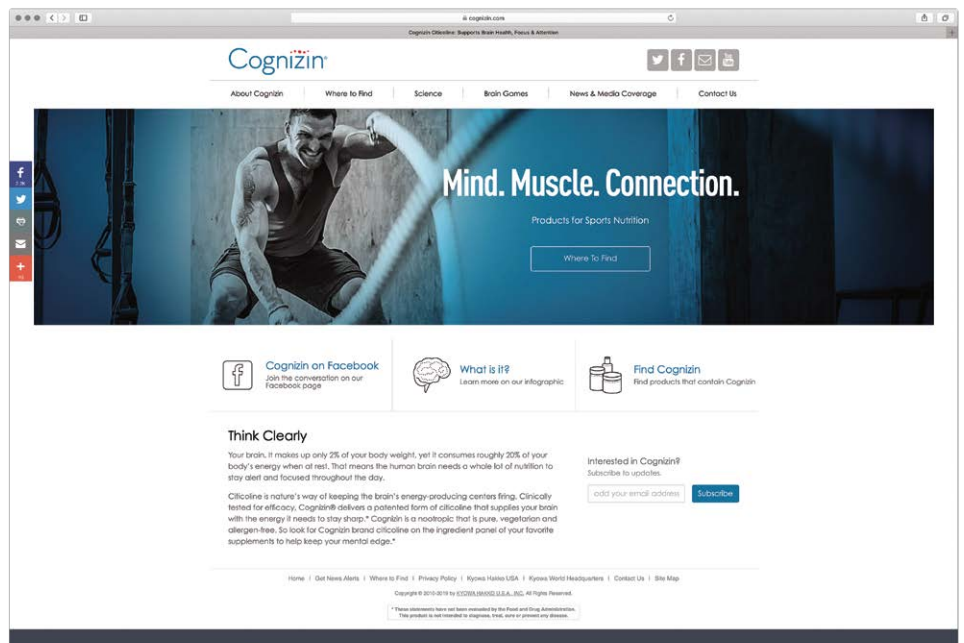
- Dedicated website at www.cognizin.com
- Increased awareness and promotion in national consumer TV, magazines, newspaper and internet communications
- Ongoing public relations campaigns for both trade and consumer
- Social media campaigns for both trade and consumer



Cognizin product applications

Cognizin is suitable for use in:

- Dietary supplements
- Beverages and beverage bases
- Breakfast cereals
- Chewing gum
- Dairy product analogs
- Frozen dairy desserts
- Hard and soft candies
- Milk and milk products
- Processed fruits and fruit juices



Cognizin's Specifications

Cognizin® claims

The following claims are provided for informational purposes and should be reviewed by your legal counsel prior to use in marketing materials, including product labels.

- Cognizin® supports focus and attention* 4,10,11,13 (≥250mg)
- Cognizin® assists your ability to stay focused* 4,10,11,13 (≥250 mg)
- Cognizin® supports focus to reduce errors while on task* 11,13 (≥250 mg)
- Cognizin® supports energy utilization in the brain* 5,7,9,15 (≥500 mg)
- Cognizin® is a brain health ingredient that provides nutritional support for attention, focus and brain energy* 9,11,13 (≥250mg)
- Cognizin® supports brain and cognitive health* 9,10,11,12,13 (≥250mg)
- Cognizin® supports phospholipid metabolism in the brain* 1,3,5,7,9
- Cognizin® supports acetylcholine production* 1,4,7
- Cognizin® supports brain DNA synthesis and repair* 1,4,7
- Cognizin® supports brain cell signaling* 4,5,7,14
- Cognizin® supports dopamine and norepinephrine production* 4,7,14,15
- Cognizin contains 20% choline by weight*
- Cognizin® supports memory* (≥500mg)

1. Wurtman RJ et al. *Biochem Pharmacol.* 2000; 60(7):989-92.
2. Rao AM et al. *J Neurosci Res.* 1999; 58(5):697-705.
3. Lopez-Coviella I et al. *J Neurochem.* 1995; 65(2):889-94.
4. Conant R, Schauss AG. *Alt Med Rev.* 2004; 9:1, 17-31.
5. Babb SM et al. *Psychopharmacology (Berl).* 2002; 161:248-54.
6. Fioravanti M, Yanagi M. *The Cochrane Library, Oxford, England.* 2006; Issue 4.
7. Secades JJ, Lorenzo JL. *Meth Find Exp Clin Pharmacol.* 2006; 27 (Suppl B):1-56.
8. Watanabe S et al. *Folia Psychiatr Neurol Jpn.* 1975; 29(1):67-76.
9. Silveri MM et al. *NMR Biomed.* 2008; 21(10):1066-75.
10. Spiers PA et al. *Arch Neurol.* 1996; 53:441-48.
11. McGlade E. et al., *Food and Nutrition Sciences.* 2012; 3:769-773.
12. Cotroneo AM, et al., *Clin Intery Aging.* 2013; 8: 131-7
13. McGlade E, et al. *J Atten Disord.* 2015.
14. Secades JJ, et al., *Meth find exp clin pharmacol.* 1995; 17 (Suppl B):1-54.
15. Stork C, et al., *Molecular Psychiatry.* 2005; 10: 900-919.

Description

Odorless, white crystalline powder

INCI Designation

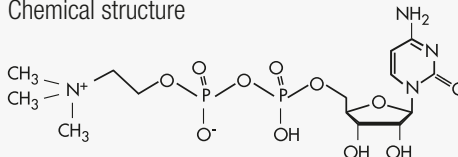
Citicoline

CAS No.

987-78-0

Physical & Chemical Properties

Empirical formula C14H26N4O11P2
Molecular weight 488.33
Chemical structure



Specifications

Appearance	White, crystalline powder
Identification	Pass test
State of solution	Colorless and clear
pH	2.5 - 3.5
Ammonium (NH4)	Not more than 0.05%
Heavy metals (as Pb)	Not more than 10 ppm
Arsenic (AS203)	Not more than 2 ppm
Free phosphoric acid	Not more than 0.1%
5'-Cytidylic acid	Not more than 1.0%
Loss on drying	Not more than 5.0%
Assay (dry basis)	Not less than 98.0%

Manufacturing Process

Cognizin® is manufactured in Japan, using a patented fermentation process. The process eliminates any risk of Transmissible Spongiform Encephalopathy (TSE) contamination.

Solubility

- Freely soluble in water
- Insoluble in fats and oils
- Very slightly soluble in alcohol

Stability

- Stable at room temperature
- Stable in liquids and to high heat

Safety Studies

- Acute toxicity (oral) LD50 > 10,000 mg/kg (mice and rats)
- Subacute toxicity (oral) No toxic signs observed at 150 mg/kg (30 day, rats)
- Cognizin® is self-affirmed GRAS

Recommended Use Levels

- Dietary Supplement 250-500 mg/day
- Food/Beverage use Maximum 250 mg/serving up to 2000 mg/day

Storage

- Store at 15°C to 30°C in tight, light resistant containers

Packing

- Standard packing 25 kg



For the evolution of your mind®

Generate breakthrough sales with the ingredient designed to boost brain energy, and support focus and attention – Cognizin*.

For more information on including Cognizin in your next product, go to Kyowa-USA.com.



For more information about Cognizin contact:

KYOWA HAKKO USA, INC.

Customer Service: 800.596.9252 info@Kyowa-USA.com

600 Third Ave. 19th Floor
New York, NY 10016

Tel: 212.319.5353
Fax: 212.421.1283

Kyowa-USA.com
Cognizin.com

