Phosphatidylcholine also may protect the body against LDL oxidation, a total and low-density lipoprotein (LDL) cholesterol levels.

During another study, seven healthy male volunteers consumed 10 grams of phosphatidylcholine each day for six weeks. Phosphatidylcholine treatment increased HDL cholesterol levels and significantly reduced plasma total and low-density lipoprotein (LDL) cholesterol levels.

Phosphatidylcholine also may protect the body against LDL oxidation, a process that promotes atherosclerotic heart disease. In vivo, phosphatidylcholine acts as an antioxidant, protecting against oxidative stress. To further study the effects of this lipid-lowering substance on LDL oxidation in vitro, researchers incubated plasma from 15 healthy volunteers with different phosphatidylcholine components, then initiated LDL oxidation. The main component of phosphatidylcholine, known as dilinoleoyl-phosphatidylcholine, prolonged the time it took until the LDL oxidized.

Cognitive-Enhancer
Because of its ability to boost levels of the neurotransmitter acetylcholine, phosphatidylcholine may play an important role in mental functioning. In one double-blind experiment, 80 college students consumed 25 grams of phosphatidylcholine or a placebo. In the phosphatidylcholine-treated subjects, the researchers noted significant improvement in explicit memory, as measured by a learning task, 90 minutes after ingestion. These improvements may have been particularly pronounced in slow learners.

In animals, phosphatidylcholine also has exerted beneficial effects. In rats, phosphatidylcholine administration enhances the animals’ ability to avoid behavior that will result in an induced shock. In one study, although phosphatidylcholine had no effect on younger animals, it significantly improved behavior that will result in an induced shock. In one study, although phosphatidylcholine had no effect on younger animals, it significantly improved learning in older mice. In another animal study, memory deficient mice with low brain acetylcholine concentrations were fed phosphatidylcholine and experienced improved memory acquisition and retention. Furthermore, phosphatidylcholine administration to mice with dementia improved memory and generally increased brain choline and acetylcholine concentrations to or above the levels of the normal control mice.

Phosphatidylcholine also appears to work synergistically with vitamin B12. In rats with lesions on their brains, low dose phosphatidylcholine combined with vitamin B12 significantly increased acetylcholine concentration and improved memory and retention.

Liver Protection
A versatile nutrient, phosphatidylcholine appears to be as effective at protecting the liver as it is in protecting brain cells. In chronically alcohol-fed baboons, phosphatidylcholine prevents hepatic fibrosis. In a human study, researchers treated six chronic liver disease patients suffering from hepatitis B or C infections or alcoholic cirrhosis for six months with 1600 mg/day of phospholipids that were 90% phosphatidylcholine. Due to an increase in HDL cholesterol and an improvement in other lipid parameters, the researchers concluded that phosphatidylcholine-rich phospholipids may be beneficial in treating chronic liver diseases.

Other studies have shown that phosphatidylcholine can protect the liver from the damaging effects of alcohol. Alcohol consumption kills the liver cells known as hepatocytes. Ethanol alcohol causes this cell-death by triggering hepatic cytochrome P-4502E1 (CYP2E1), which generates free radicals and enhances lipid peroxidation. Because phosphatidylcholine reduces the activity of CYP2E1 and prevents oxidative stress, researchers examined its effects on 28 rats fed diets containing either alcohol or carbohydrates for 28 days. Half of the rats were given phosphatidylcholine and the other half received the same amount of safflower oil and choline bitartrate. Alcohol feeding resulted in a 4.5-fold increase in the death of hepatocytes compared to control rats. Phosphatidylcholine supplementation impressively decreased the alcohol-induced cell-death to less than half, probably due to its antioxidative action.

**RECOMMENDED DOSAGE**
One to three softgels daily.

**PRODUCT CODE**
#1241 120 softgels (385 mg)

**FORMULA**

<table>
<thead>
<tr>
<th>Supplement Facts</th>
<th>% Daily Value***</th>
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<tbody>
<tr>
<td>Amount Per Serving</td>
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<tr>
<td>9</td>
<td>Calories from Fat 9</td>
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<tr>
<td>Total Fat 1 g</td>
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<td>Phosphatidylcholine 385 mg</td>
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<td>**Daily Values are based on a 2,000 calorie diet</td>
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**REFERENCES**