

# Acetyl-L-Carnitine Supplements Review

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Photo: ConsumerLab.com



## Update:

**Vitacost Acetyl-L-Carnitine HCl 500 mg** (4/1/16, Updated 4/5/16): A CL member reported recently purchasing this product on Amazon.com (where it is listed as "from Vitacost Brand") but, upon opening the sealed container, noticed, that *"the capsules are two different colors. About half are a solid light cream color. The other half have light tan spots all over the capsule."* [See Photo](#). Despite the odd appearance, a family member used the product for four days. No adverse effects were reported. The product is marked Lot # 503872, Exp date - 4/18.

When ConsumerLab.com tested this product in 2012 for its Review (below), all capsules had a uniform whitish color -- none had spots. The spots are not normal. It would appear that there is a problem with the production of this product. We speculate that some of the capsules may have been exposed to conditions which oxidized certain components. If you have purchased a similar product, we suggest that you do not use it.

We asked Vitacost for a response and received the following on 4/5/16: *"A little background on the product: Carnitine is a very unstable molecule, especially in its base form. Acetyl-L Carnitine is more stable, but it is very sensitive to moisture and temperature. If bottles are not closed tightly, they will easily oxidize, a process that may result in spots. It's important to note that although it may be unsightly, spotting does not necessarily means that the product is bad or that it has lost its efficacy. We have checked multiple samples of lot you referenced and are not seeing oxidation or any other color inconsistencies."*

*"Because items on Amazon are not being sold directly through us, we unfortunately cannot guarantee the product was stored properly in the seller's possession. Vitacost distribution centers are temperature and moisture controlled and we recommend that your member purchase this product from us directly in the future. Once you receive your Acetyl-L Carnitine, it should be stored in a cool, dry place (we don't recommend storing it in a bathroom because of the heat and moisture) and kept tightly sealed. That being said, we stand behind all of our Vitacost brand products, and our policy is that we'll buy it back if you're not satisfied for any reason - even if the bottle or bag is empty. If your member is a customer of Vitacost we can offer them a full refund. If not, we are more than happy to send a replacement bottle at no charge!"*

Since originally posting this update, another CL member notified us of the same problem with the same product bearing the same lot number and expiration date, supplying us with photographic evidence and noting that some of the product had been used without harm. This time, however, the product had been purchased directly from Vitacost (which has provided a full refund). We have asked Vitacost to comment on this second report, particularly as the product was purchased from Vitacost and not a third party, and to explain why only some of the capsules are spotted. We were told that a response will be provided this week, and we will post the response here. [No response was received from Vitacost.]

Problems with products can be reported to ConsumerLab.com at [www.ConsumerLab.com/SupplementProblemReport.asp](http://www.ConsumerLab.com/SupplementProblemReport.asp).

## What It Is:

Acetyl-L-carnitine is a particular form of carnitine, a non-essential amino acid that can be synthesized in the body from lysine and methionine and is found in red meats and dairy products. It is believed that acetyl-L-carnitine plays a role in production of acetylcholine, an important neurotransmitter.

## What It Does:

Acetyl-L-carnitine is one of many dietary supplement ingredients that have been used to help prevent or treat **memory disorders**. Other ingredients tested and reviewed by ConsumerLab.com include [ginkgo](#), [huperzine A](#), [ginseng](#), [niacinamide](#), and [fish/marine oils](#). Additional clinical information about these and other ingredients, including phosphatidylserine, *Bacopa monniera*, and vinpocetine is found in the article "[Enhancing Memory and Mental Function](#)" in the Encyclopedia on this site.

Acetyl-L-carnitine may improve memory and cognition in older people with age-related memory problems. While early studies found evidence of modest benefit with acetyl-L-carnitine in Alzheimer's disease and other forms of dementia, more recent, large studies failed to find it effective ([Hudson, Cochrane Database Syst Rev 2003](#)). However, acetyl-L-carnitine may have benefit in mild cognitive impairment and early Alzheimer's disease ([Montgomery, Int Clin Psychopharmacol, 2003](#)).

Acetyl-L-carnitine seems to improve symptoms of **diabetic neuropathy** and **neuropathy associated with antiretroviral drug therapy** used by people with HIV infection. It also may reduce pain and improve mental health in people with fibromyalgia.

Taking acetyl-L-carnitine in combination with propionyl-L-carnitine seems to help symptoms of **androgen decline** in older men, improving **sexual dysfunction**, **depression**, and **fatigue**. It may also improve **memory** in chronic alcoholics and increase **sperm motility** in men with infertility. Acetyl-L-carnitine may be helpful in an inflammatory condition of the penis called **Peyronie's disease**, where it has been shown to reduce pain and slow progression of the disease ([Biagiotti, BJU Int. 2001](#)). Early research suggests that acetyl-L-carnitine might reduce **hyperactivity** in boys with **fragile X syndrome**.

Some studies with L-carnitine (not acetyl-L-carnitine) have evaluated its potential use in **weight loss** because L-carnitine is involved in the transport of fatty acids into the mitochondria of cells for use as fuel. However, a weight loss benefit has not been demonstrated. A study in which moderately obese women were given 2 grams daily of L-carnitine for eight weeks showed no effect on amounts of body fat

or body weight ([Villani, Int J Sport Nutr Excerc Metab 2000](#)).

See the Encyclopedia on this website for more information about clinical studies with [acetyl-L-carnitine](#).

## Quality Concerns and What CL Tested for:

Neither the U.S. government nor any other agency is responsible for routinely testing dietary supplements for their contents or quality. In order to help consumers identify products of better quality, ConsumerLab.com purchased and tested acetyl-L-carnitine supplements for the quality of their ingredients and other relevant parameters as described below. See [Testing Method](#) for more details.

Because carnitine is sold in different chemical forms that may have different effects, CL specifically tested for acetyl-L-carnitine, the form most studied for memory enhancement. Any product in tablet form (excluding chewable and time-release tablets) was tested for its ability to properly break apart (disintegrate) in solution — which is necessary for ingredients to be absorbed.

## What CL Found

All three of the acetyl-L-carnitine supplements selected for review by ConsumerLab.com passed testing (*Bluebonnet, Doctor's Best, and Jarrow Formulas*) as did four other products (*GNC, Twinlab, Vitacost* (see [Update](#)), and *Vitamin Shoppe*) tested through CL's [Voluntary Certification Program](#).

As acetyl-L-carnitine supplements are among the more expensive supplements and the products essentially contain the same key ingredient in a capsule, it pays to comparison shop for the lowest cost while factoring in other special requirements you may have, such as having a product that is gluten free, kosher, etc. The cost to obtain a 1,500 mg dose of acetyl-L-carnitine from the reviewed products ranged from a low of 30 cents from *Vitacost* (which is gluten-free) (see [Update](#)) to a high of \$1.24 from *Bluebonnet* (which is gluten-free as well as vegetarian and kosher).

## Test Results by Product:

Listed below are the test results for seven different acetyl-L-carnitine supplements, listed alphabetically. ConsumerLab.com selected three products. Three other products (each indicated with an asterisk) were tested at the request of their manufacturers/distributors through [CL's Voluntary Certification Program](#) and are included for having passed testing.

Shown for each product is the claimed amount and form of the tested ingredient and the serving size recommended on the label. The full list of ingredients is available for each product by clicking on the word "Ingredients" in the first column. Products listed as "Approved" met their label claims and ConsumerLab.com's quality criteria (see [Passing Score](#)). Be aware that suggested serving sizes on labels may not reflect an appropriate dosage for your intended use. Be sure to compare the "Suggested Daily Serving" in the second column to dose information provided in [What to Consider When Using](#). Cost comparisons are shown in the last column.

CONSUMERLAB.COM RESULTS FOR ACETYL-L-CARNITINE SUPPLEMENTS				
Click on <a href="#">\$ Price Check</a> beneath a product name to find a vendor that sells it. To find retailers that sell some of the listed products <a href="#">click here</a> .				
Product Name, Unit Type, and Suggested Daily Serving  (Click on "Ingredients"	Amount of Acetyl-L-Carnitine Per Suggested Daily Serving on Label	--TEST RESULTS --		
		OVERALL RESULTS:	Met Claim	Broke Apart Properly

for Full List and Special Designations)		<b>APPROVED (Passed) or NOT APPROVED (Failed)</b>			<b>Cost For Suggested Daily Serving</b>  <b>Additional Key Ingredients, Product Notes, and/or Special Designations<sup>2</sup></b>  <b>Price Paid</b>
<b>Acetyl-L-Carnitine Supplements:</b>					
Bluebonnet Acetyl-L-Carnitine 500 mg (1 vegetarian capsule daily)  Mfd. by Bluebonnet Nutrition Corporation <a href="#">Ingredients</a> <a href="#">\$ Price Check</a>	500 mg	<b>APPROVED</b>	✓	N/A	\$1.24  \$0.41  <i>Vegetarian, Gluten free and kosher</i>  \$24.76/60 vegetarian capsules
Doctor's Best® Best Acetyl-L-Carnitine (1 to 4 capsules daily)  Dist. by Doctor's Best, Inc. <a href="#">Ingredients</a> <a href="#">\$ Price Check</a>	500 to 2,000 mg	<b>APPROVED</b>	✓	N/A	\$0.55  \$0.18 - \$0.73  \$21.99/120 capsules
GNC Acetyl L-Carnitine 500 (1 to 2 capsules daily)*  Dist. by General Nutrition Corporation <a href="#">Ingredients</a>	500 to 1,000 mg	<b>APPROVED</b>	✓	N/A	\$0.87  \$0.29 - \$0.58  <i>Gluten free</i>  \$34.99/120 capsules
Jarrow Formulas® Acetyl L-Carnitine 500 (1 capsule, once or twice daily)  Dist. by Jarrow Formulas® <a href="#">Ingredients</a> <a href="#">\$ Price Check</a>	500 to 1,000 mg	<b>APPROVED</b>	✓	✓	\$0.52  \$0.17 - \$0.35  <i>Vegan/Vegetarian and Gluten free</i>  \$20.99/120 vegetarian capsules
Twinlab® Acetyl-L-Carnitine (1 capsule, one to four times daily)*  Mfd. by ISI Brands, Inc. <a href="#">Ingredients</a> <a href="#">\$ Price Check</a>	500 to 2,000 mg	<b>APPROVED</b>	✓	N/A	\$0.75  \$0.25 - \$1.00  \$30.19/120 capsules
Vitacost® Acetyl-L-Carnitine HCl 500 mg (1 capsule daily)* (See <a href="#">Update</a> )  Dist. by Vitacost® <a href="#">Ingredients</a>	500 mg	<b>APPROVED</b>	✓	N/A	\$0.30  <b>Lowest cost for acetyl-L-carnitine</b>  \$0.10  <i>Gluten free</i>

					\$11.99/120 capsules
Vitamin Shoppe® Acetyl-L-Carnitine 500 mg (1 capsule daily)*  Dist. by The Vitamin Shoppe® <a href="#">Ingredients</a> <a href="#">\$ Price Check</a>	500 mg	<b>APPROVED</b>	✓	N/A	\$0.87 \$0.29 \$34.99/120 capsules
<p>Not applicable: Only non-chewable, non-capsule, non-enteric coated, and non-time release formulations are tested for disintegration.</p> <p>* Tested through CL's <a href="#">Voluntary Certification Program</a> prior to, at time of, or after the posting of this Product Review.</p> <p>** Product identical in formulation and manufacture to a product that has passed testing but sold under a different brand. For more information see CL's <a href="#">Multi-Label Testing Program</a>.</p> <p><sup>1</sup> Amounts shown are for general comparison purposes and are calculated from the price paid by ConsumerLab.com (without tax or shipping) and amounts of Acetyl-L-Carnitine shown on labels. Unit amounts of some products do not provide exactly 1,500 mg of Acetyl-L-Carnitine. Prices may vary by retailer and number of pills per package.</p> <p><sup>2</sup> Not tested but claimed on label.</p> <p>Unless otherwise noted, information about the products listed above is based on the samples purchased by ConsumerLab.com (CL) for this Product Review. Manufacturers may change ingredients and label information at any time, so be sure to check labels carefully when evaluating the products you use or buy. If a product's ingredients differ from what is listed above, it may not necessarily be of the same quality as what was tested.</p> <p>The information contained in this report is based on the compilation and review of information from product labeling and analytic testing. CL applies what it believes to be the most appropriate testing methods and standards. The information in this report does not reflect the opinion or recommendation of CL, its officers or employees. CL cannot assure the accuracy of information.</p> <p>Copyright ConsumerLab.com, LLC, 2012 All rights reserved. Not to be reproduced, excerpted, or cited in any fashion without the express written permission of ConsumerLab.com LLC</p>					

## ConsumerTips™:

### What to Consider When Buying:

Different forms of carnitine are used for different purposes. Acetyl-L-carnitine is somewhat different from both L-carnitine and propionyl-L-carnitine. Although the body can convert L-carnitine to acetyl-L-carnitine and vice versa, it is not known whether the benefits of acetyl-L-carnitine are from the intact molecule, from its metabolites, or some other activated form, so it is advisable not to substitute one form of carnitine for another. Another form of carnitine, D-carnitine, should not be used as it may compete with other forms of carnitine and cause symptoms of carnitine deficiency.

### What to Consider When Using:

Acetyl-L-carnitine is taken in fairly large doses - often measured in grams rather than milligrams (1,000 mg = 1 gram). In Alzheimer's disease, 1.5 to 4 grams daily has been used, usually divided into two or three doses during the day. In age-related memory impairment, 1.5 to 2 g daily has been used. For depression in the elderly, 1.5 to 3 grams daily in divided doses has been used.

For diabetic neuropathy, 1.5 to 3 grams per day in divided doses has been used, with the higher dose apparently more effective for improving vibratory sensations and reducing neuropathy-related pain. For neuropathy associated with antiretroviral drug therapy, the dose is 1 gram two times daily. The dose for reducing fibromyalgia pain is 1.5 grams each day.

In infertile men, 3 to 4 grams daily has been used to improve sperm function, sometimes as a mixture of acetyl-L-carnitine and L-carnitine. For Peyronie's disease, 2 grams divided into two doses during the day for 3 months has been used. For symptoms of age-related testosterone deficiency, 2 grams of acetyl-L-carnitine plus 2 grams of propionyl-L-carnitine daily have been used. For boys with fragile X syndrome, the daily dose to reduce hyperactivity is 20 to 50 mg/kg.

## Concerns and Cautions:

Alzheimer's disease and other types of severe age-related mental impairment are too serious to treat on your own and the symptoms of these diseases could be confused with those of other serious conditions. It is advisable to see your doctor before self-medicating for severe memory or cognitive problems.

Acetyl-L-carnitine is believed to be quite safe, but may cause gastrointestinal side-effects and agitation. It can also cause the urine, breath and sweat to have a fishy odor.

Acetyl-L-carnitine should be used with caution in people taking blood-thinning medication, as it can theoretically increase the anti-coagulant effect.

People with low or borderline-low thyroid levels should not take acetyl-L-carnitine or other forms of carnitine because it may impair thyroid hormone function. Low thyroid levels are particularly common among women over 60 years of age. (Conversely, in cases of *hyperthyroidism* giving acetyl-L-carnitine or other forms of carnitine may be helpful.) ([Benvenga, Ann NY Acad Sci 2004](#)).

Individuals on dialysis should not take this without a physician's supervision when used orally and appropriately.

See the Encyclopedia on this website for more information about clinical studies and drug interactions for [acetyl-L-carnitine](#).

## L-carnitine

Although acetyl-L-carnitine is not the same as L-carnitine, it contains (and provides) L-carnitine, so it is worth noting the following concerns with L-carnitine:

Some research suggests that [L-carnitine](#) intake may contribute to cardiovascular disease in certain people. People who eat red meat (e.g., beef) maintain organisms in their gut which digest carnitine to the compound TMA, which is then converted in the liver to the compound TMAO, which appears to advance atherosclerosis (hardening of the arteries) by reducing the normal clearing of cholesterol ([Koeth, Nature Medicine 2013](#)). Vegetarians and vegans do not have this reaction when first exposed to carnitine. Supplementing with L-carnitine (and possibly acetyl-L-carnitine due to their chemical similarity, i.e., both contain the TMA moiety) may potentially foster growth of these organisms, increase levels of TMAO, and have negative long-term cardiovascular effects. However, a study among healthy, active older women found no significant increase in blood-based markers thought to predict future cardiovascular events when they were given 1,020 mg of L-carnitine (from 1,500 mg of L-carnitine-L-tartrate) for 24 weeks even though their blood levels of TMAO increased ten-fold ([Samulak, Ann Nutr Metab 2018](#)).

Also, L-carnitine may **worsen chemotherapy-related nerve damage**: A double-blind, placebo-controlled study among women receiving taxane-based chemotherapy to treat breast cancer found that 3 grams of L-carnitine taken daily for 5 ½ months significantly worsened symptoms of chemotherapy-induced

peripheral neuropathy compared to placebo, and this difference was also seen after 2 years. The effect was unexpected, although a similar problem has been observed with other antioxidants given during chemotherapy ([Hershman, J Clin Oncol 2018](#)).

Information on this site is provided for informational purposes only. It is not an endorsement of any product nor is it meant to substitute for the advice provided by physicians or other healthcare professionals. The information contained herein should not be used for diagnosing or treating a health problem or disease. Consumers should inform their healthcare providers of the dietary supplements they take.

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