Carnipure® L-carnitine

Purity you can trust

What Is Carnipure® L-carnitine?

Carnipure® is high quality L-Carnitine manufactured by Lonza. The Carnipure® brand and quality seal stand for more than 35 years of expertise and high reputation in the production of quality products, and Lonza's Carnipure® L-carnitine has over 35 years of research supporting its safety and efficacy.

Products displaying the Carnipure® quality seal on the packaging show the consumer that they contain high quality L-Carnitine from Lonza.

About Lonza

- Swiss life-science company founded in 1897
- One of the world's leading and most-trusted suppliers to the pharmaceutical, biotech and specialty ingredients markets
- The global leader in the production and support of active pharmaceutical ingredients (APIs) based on both chemical as well as biotechnological platforms
- One of the world's leading suppliers of L-Carnitine (Carnipure®)

Carnipure® quality

The proprietary and fully backward integrated Carnipure® production process was invented by Lonza scientists in Switzerland. It directly produces the L-isomer of carnitine, the form found in nature.

Under the Carnipure® brand, Lonza offers the following products:

- Carnipure® L-carnitine crystalline
- Carnipure® L-carnitine tartrate

Carnipure® L-carnitine crystalline is pure L-carnitine, whereas Carnipure® L-carnitine tartrate is a salt of 68% L-carnitine and 32% L-tartaric acid, which is the highest L-carnitine concentration of any currently commercially available nonhygroscopic salt form.

Carnipure® products are all bright white as well as heat and pH stable. They can be used in dietary supplements in the form of tablets, capsules, and powders as well as in beverages, bars, dairy and other food products.

Carnipure® products are:

- **ISO 9001:2008 and FSSC 22000:2010 certified**
- **Kosher and halal certified**
- **Allergen free**
- **Fully traceable**

Carnipure® product safety

Carnipure® products are regarded as safe. Both Carnipure® L-carnitine crystalline and Carnipure® L-carnitine tartrate are self-affirmed GRAS (Generally Recognized As Safe). Carnipure® L-carnitine tartrate is considered safe for daily consumption by the EFSA (European Food Safety Authority) and approved by the Japanese MHLW (Ministry of Health, Labor and Welfare).

Thanks to its excellent safety profile, Carnipure® L-carnitine has been used in infant nutrition for more than 30 years. Babies are dependent on exogenous sources as their L-carnitine biosynthesis is not yet fully developed. Therefore it is important that infant formulas contain L-carnitine. Many countries have set minimum, but no maximum requirement levels for L-carnitine used in infant nutrition. Carnipure® L-carnitine also finds its way into clinical nutrition products in various health areas. Considering that 1 kg of Carnipure® L-carnitine will end up in more than 900,000 standard servings (100 ml) of infant formula, Lonza's high quality standards are especially important in those sensitive markets.

Carnipure® products have been **safely used to support infant nutrition** for more than 30 years.

Carnipure® L-carnitine science

Lonza has conducted several human studies in collaboration with universities and research centers around the world to study the benefits of Carnipure® L-carnitine in human nutrition. Since L-carnitine has a central role in metabolism, Carnipure® L-carnitine has been shown to be beneficial for many areas of health.

Weight management

Carnipure® L-carnitine supplementation was found to increase the oxidation of fatty acids in healthy human subjects.[1, 2] In two different studies, the subjects received labeled fatty acids with a meal, prior to and after ten days of supplementation with Carnipure® L-carnitine. As a breakdown product of labeled fatty acids, labeled CO2 was then measured in the exhaled air. In the group that received Carnipure® L-carnitine tartrate, a significant increase in exhalation of labeled CO2 was observed, indicating a significant increase in fatty acid oxidation (Fig. 1).This leads to the conclusion that this nutrient can be beneficial to people who care about their weight or participate in any weight management programs.

When used in conjunction with motivation training covering healthy eating as well as activity programmes, daily low dose Carnipure® L-carnitine supplementation resulted in a statistically significant reduction in body weight in overweight people and a decrease in blood triglyceride levels.[3]

It is important to remember that the dietary supplement L-carnitine is not recommended as a treatment for obesity. This is a disease that requires intervention by a health professional. However, on the basis of the above studies, it can be concluded that supplementary Carnipure® L-carnitine can contribute to optimal fat oxidation and, along with dietary changes and exercise, Carnipure® L-carnitine supplementation may promote a healthier body weight. It can therefore be an important part of a healthy weight management program for individuals concerned about their weight.

Recovery after exercise

Studies show that Carnipure® L-carnitine tartrate supplementation may support recovery after exercise. Researchers observed a decrease in the production of free radicals, less tissue damage and reduced muscle soreness after exercise in recreationally trained athletes following 3 weeks of Carnipure® L-carnitine tartrate supplementation. These effects were found to be dose-dependent, present both in young and old, male and female subjects. Supplementation with Carnipure® L-carnitine tartrate was found to induce an increase in muscle oxygen consumption, providing a potential mechanism for reduced hypoxic stress following resistance exercise.[4–6]

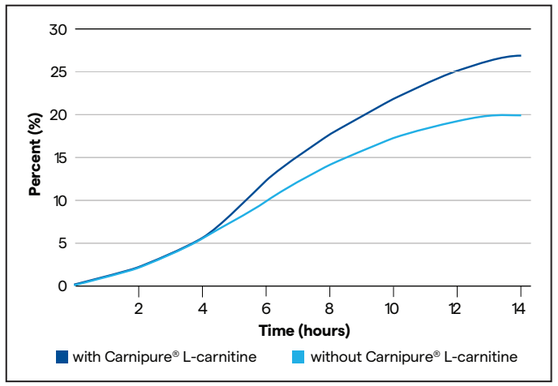

Figure 1: Cumulative 14-hour % of CO2 exhalation before and after Carnipure® L-carnitine tartrate supplementation[2]

In the body

Small amounts of L-carnitine are synthesized in the body every day. L-carnitine is naturally present in the human diet in a variety of food sources, particularly in red meat. A well-balanced, non-vegetarian Western diet is estimated to provide 100–300 mg of L-carnitine per day. In Europe and the U.S., however, dietary L-carnitine intake has decreased by about 20% over the last decade, mainly as a result of a decrease in beef consumption.

L-carnitine's role in fat metabolism can be easily summarized: **Carnipure® L-carnitine turns fat into energy**. More precisely, L-carnitine is essential for transporting long-chain fatty acids across the mitochondrial membrane, for subsequent fat breakdown and energy generation (Fig. 2).

Additionally, a sufficiently high concentration of free L-carnitine inside the mitochondria can maintain energy generating processes that depend on the availability of free coenzyme A. If there is only little free coenzyme A available, L-carnitine can bind the acetyl-units temporarily and thus ensure that more energy is generated.

Furthermore, L-carnitine may support the excretion of acids, a function which may be important after strenuous exercise or for certain metabolic conditions.

Additional health benefits

Due to its fundamental role in energy metabolism, L-carnitine is typically used by the body to support functions that have a high energy demand. In this sense, L-carnitine supplementation plays a role in heart health, male fertility, healthy aging, as well as for infants, pregnant women and vegetarians.

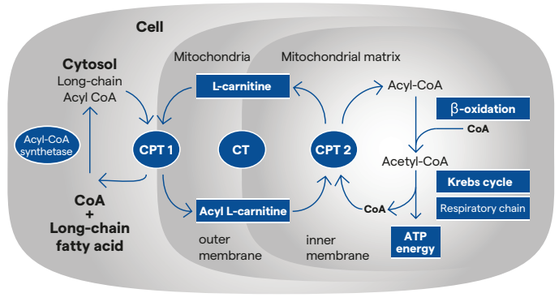

Figure 2: The transport of fatty acids by L-carnitine from the cytosol into the mitochondria

Contact us to **learn more about the robust body of scientific evidence supporting the role of Carnipure® L-carnitine** in health and wellness.

As a Carnipure® products customer, you can expect...

Marketing support

As a raw ingredient manufacturer, we not only actively promote our ingredients on a business-to-business level, but we also support our customers in their marketing efforts towards the end consumer.

Regulatory support

Our regulatory experts collaborate with authorities and organizations globally to work towards a regulatory situation that is in favor of Carnipure® products. We have years of experience with regulatory dossiers and a track record of successful regulatory initiatives.

Formulation support

Both Carnipure® L-carnitine crystalline and Carnipure® L-carnitine tartrate are manufacturer friendly: they are bright white, pH and heat stable, highly water soluble and form colorless solutions. Our team has vast formulation knowledge on beverages, dairy, bakery and confectionery and is happy to share this with our customers.

Scientific support

For many years now, Lonza has worked in collaboration with universities and research centers around the world to strengthen the scientific backing of Carnipure® L-carnitine. We maintain a database with more than 20,000 entries of published literature which is used by our technical experts to provide tailor-made, well-researched answers on technical questions.

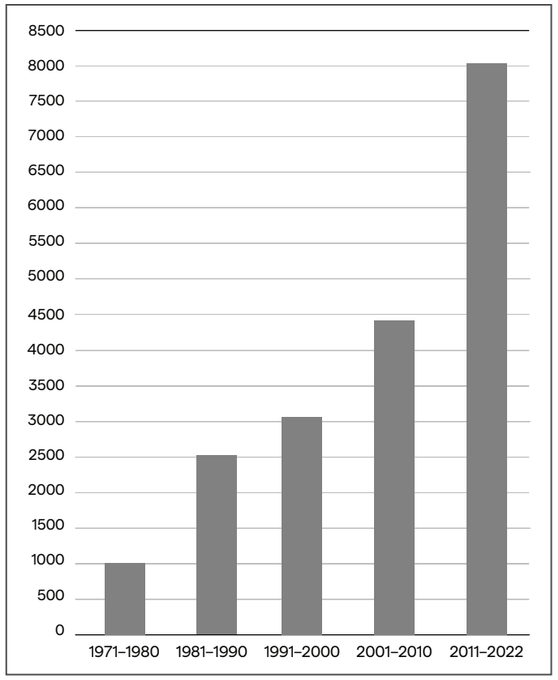

Figure 3: Number of scientific publications on L-Carnitine is steadily increasing (source: PubMed (2022) www.ncbi.nlm.nih.gov)

Why Carnipure® L-carnitine?

- **Easy to integrate** into a wide range of applications and formulations
- **Easy to understand** health benefits
- 35+ years of clinical research supporting **safety and efficacy with full traceability**
- Proven to **accelerate exercise recovery** by 44%[7]
- Proven to **reduce delayed onset muscle soreness** by 30%
- Produced with unsurpassed purity and potency, and **industry-leading quality standards**[8]

Learn more about how Carnipure® L-carnitine can help you break through in the competitive nutrition market.

Contact us or your Lonza Capsules & Health Ingredients sales representative **for more information.**

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†These statements have not been evaluated by the FDA. This product is not intended to diagnose, treat, cure, or prevent any disease.

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