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Nutrition
English

Carnipure™
Purity You Can Trust

Carnipure™ for Human Nutrition

Information for Professionals

Carnipure™ offers purest
L-carnitine and is a trademark
of Lonza Ltd, Switzerland.

What Is Carnipure™?

Carnipure™ is high quality L-carnitine manufactured by Lonza. The Carnipure™ brand and quality seal stand for more than 25 years of expertise and high reputation in the production of quality products.

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About Lonza

- Swiss life-science company founded in 1897
- One of the world's leading suppliers to the pharmaceutical, healthcare and life-science industries
- The global leader in the production and support of active pharmaceutical ingredients (API's) based on both chemical as well as biotechnological platforms
- The global leader in microbial control solutions
- The world's biggest supplier of vitamin B_3 (Niacin and Niacinamide) and L-carnitine

Products displaying the Carnipure™ quality seal on the packaging show the consumer that they contain purest L-carnitine from Lonza.

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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™ crystalline
- Carnipure™ tartrate

Carnipure™ crystalline is pure L-carnitine, whereas Carnipure™ 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 non-hygroscopic 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™ crystalline and Carnipure™ tartrate are:

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

« Carnipure™ products have been successfully used in infant nutrition for more than 25 years »

Carnipure™ Safety

Carnipure™ products are regarded as safe. Both Carnipure™ crystalline and Carnipure™ tartrate are self-affirmed GRAS (Generally Recognized As Safe). Carnipure™ 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™ has been used in infant nutrition for more than 25 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™ also finds its way into clinical nutrition products in various health areas. Considering that 1 kg of Carnipure™ 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™ Science

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

Weight Management

Carnipure™ 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™. As a breakdown product of labeled fatty acids, labeled CO_2 was then measured in the exhaled air. In the group that received Carnipure™ tartrate, a significant increase in exhalation of labeled CO_2 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.

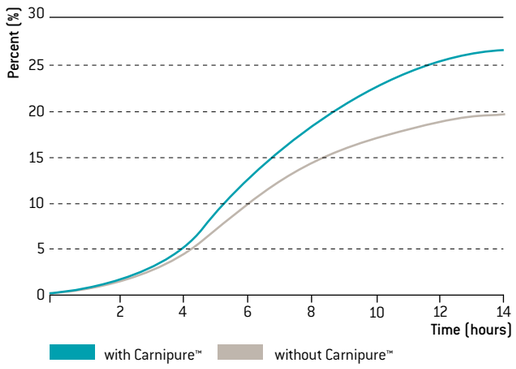


Figure 1

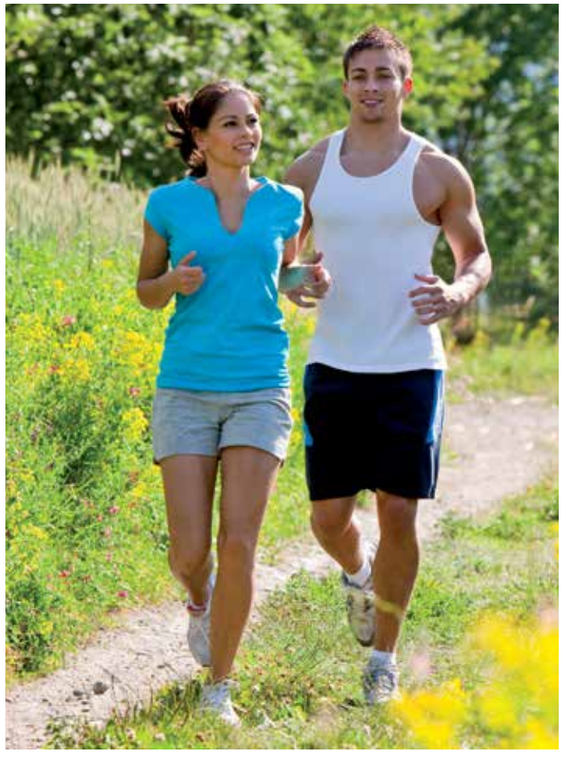
Cumulative 14-hour % of CO_2 exhalation before and after Carnipure™ tartrate supplementation[2]

When used in conjunction with motivation training covering healthy eating as well as activity programmes, daily low dose Carnipure™ 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™ can contribute to optimal fat oxidation and, along with dietary changes and exercise, Carnipure™ 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™ 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™ tartrate supplementation. These effects were found to be dose-dependent, present both in young and old, male and female subjects. Supplementation with Carnipure™ tartrate was found to induce an increase in muscle oxygen consumption, providing a potential mechanism for reduced hypoxic stress following resistance exercise[4–6].



References of Carnipure™ Studies:

1 Müller DM et al. (2002). Metabolism 51(11):1389
2 Wutzke KD et al. (2004). Metabolism 53(8):1002
3 Odo S et al. (2013). Food Sci Nutr 4(2):222
4 Volek JS et al. (2002). Am J Physiol Endocrinol Metab 282:E474
5 Spiering BA et al. (2007). J Strength Cond Res 21(1):259
6 Ho JY et al. (2010). Metabolism 59:1190

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 USA, 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™ 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.

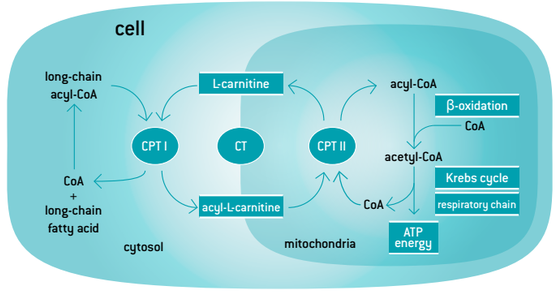


Figure 2

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

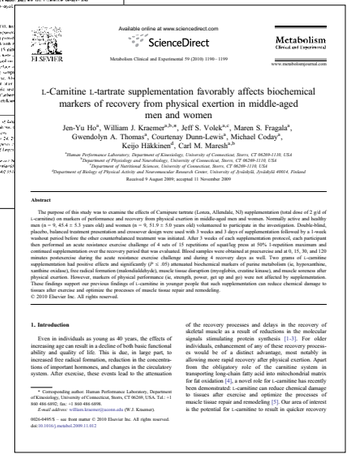
Additional Health Benefits

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.

Please ask for our Scientific Focus series to get more details about the areas mentioned above, or contact our scientific experts who work with a literature database of scientific publications on L-carnitine on a daily basis.


Effects of Oral L-Carnitine Supplementation on In Vivo Long-Chain Fatty Acid Oxidation in Healthy Adults

D.M. Müller, H. Seim, W. Kiess, H. Löster, and T. Richter


L-Carnitine L-tartrate supplementation favorably affects biochemical markers of recovery from physical exertion in middle-aged men and women

Jen-Yu Ho, William J. Kraemer, Jeff S. Volek, Maren S. Fragala, Gwendolyn A. Thomas, Courtenay Dunn-Lewis, Michael Coday, Keijo Häkkinen, Carl M. Maresh

Additionally, You as a Carnipure™ Customer 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™ crystalline and Carnipure™ 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.

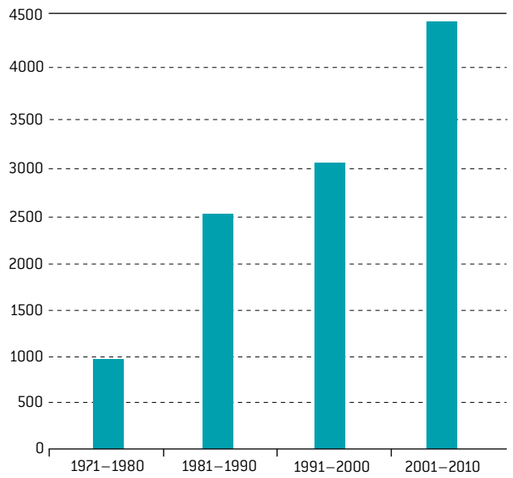


Figure 3
Number of scientific publications on L-carnitine is steadily increasing (source: PubMed (2010) www.ncbi.nlm.nih.gov)

Scientific Support
For many years now, Lonza has been working in collaboration with universities and research centers around the world to strengthen the scientific backing of Carnipure™. 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.

« Benefit from this expertise »

Carnipure™ Offers:

- Solid scientific background
- Excellent safety profile / full traceability
- Easy integration into formulations
- Easy to understand health effects

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Note: This document is an overview for professionals of published scientific information on L-carnitine and published scientific information on clinical and nutritional trials with L-carnitine and its derivatives. No claims are made herein for any particular consumer product, and any use of these statements is the sole responsibility of the user based on his/her independent evaluation. The republication of the statements made herein is prohibited. It is always important to ensure that final communications to the consumer on food and food supplement products containing L-carnitine comply with the applicable health claims regulations in the regions / countries where the products are marketed. The recommended use for Carnipure™ is as a nutrient or dietary supplement. The intended use of products containing L-carnitine may be subject to different laws and regulations. The statements in this document have not been evaluated by the U.S. Food and Drug Administration. Lonza's Carnipure™ is not intended for use to diagnose, treat, cure or prevent any disease. The information contained herein is believed to be correct and corresponds to the latest state of scientific and technical knowledge. However, no warranty is made, either expressed or implied, regarding its accuracy or the results to be obtained from the use of such information and no warranty is expressed or implied concerning the use of these products. The buyer assumes all risks of use and / or handling. No statement is intended or should be construed as a recommendation to infringe any existing patent.