

L-Carnitine

Dosage & Timing Guide

Which form to buy, how much to take, and when to time it around training and meals for the effect you actually want.

Evidence-based approach: exercise physiology and fatty-acid oxidation research (Wall et al., 2011; Stephens et al., 2007).

Why Form Matters

L-carnitine shuttles long-chain fatty acids into the mitochondria, where they're oxidized for energy. That mechanism is the basis for most of its claimed benefits, but the form you buy changes what it actually does in practice. Plain L-carnitine is the base compound. Acetyl-L-carnitine (ALCAR) crosses the blood-brain barrier more readily and is used more for cognitive and neurological research. L-carnitine L-tartrate (LCLT) is the form used in most exercise-recovery studies, chosen for its faster absorption rate.

Section 1 — Matching Form to Goal

— Exercise recovery / muscle soreness

L-carnitine L-tartrate (LCLT), 1-2g. A study by Spiering et al. in the Journal of Strength and Conditioning Research found 2g/day of LCLT reduced markers of muscle tissue disruption after resistance exercise.

— Cognitive / neurological focus

Acetyl-L-carnitine (ALCAR), 500-1500mg. Preferred for CNS research due to better blood-brain-barrier penetration than plain L-carnitine.

— General fat-oxidation support

Plain L-carnitine or LCLT, 500mg-2g. Note: carnitine does not increase fat oxidation in people with normal muscle carnitine stores unless paired with elevated insulin (i.e., taken with carbohydrate).

Section 2 — Why Most People Take It Wrong

A study by Stephens and colleagues (2007, Journal of Physiology) found that oral supplementation is negligible on its own — plasma carnitine rises, but without a strong insulin signal. Co-ingesting carnitine with roughly 80g of carbohydrate (a substantial insulin response) increased muscle carnitine retention meaningfully alone. This is the single most overlooked detail in carnitine supplementation.

Section 3 — Timing Protocol

— With a carbohydrate-containing meal

Take your dose alongside a meal with roughly 50-80g of carbohydrate. This is what actually drives muscle uptake, per the insulin-mediated mechanism above.

— 30-60 minutes pre-workout (LCLT)

For the recovery/soreness-reduction effect studied by Spiering et al., dosing before training is the protocol used in the research.

— Avoid empty-stomach, no-carb dosing

Taking carnitine alone, fasted, produces a rise in blood plasma levels with comparatively little getting into muscle where it's needed.

Dosing at a Glance

FORM	TYPICAL DOSE	BEST TAKEN
Plain L-Carnitine	500mg - 2g/day	With carb-containing meal
L-Carnitine L-Tartrate	1 - 2g	Pre-workout, with carbs
Acetyl-L-Carnitine	500 - 1500mg	Morning, with food

Sources

Stephens, F.B. et al. (2007). Insulin stimulates L-carnitine accumulation in human skeletal muscle. The Journal of Physiology.

Spiering, B.A. et al. (2007). Effects of L-carnitine L-tartrate supplementation on muscle oxygenation responses to resistance exercise. J Strength Cond Res.

Wall, B.T. et al. (2011). Chronic oral ingestion of L-carnitine and carbohydrate increases muscle carnitine content and alters muscle fuel metabolism. J Physiology.