



THE ONLY SUPPLEMENTS YOU NEED TO GET THE BODY YOU WANT.

THE COMPLETE GUIDE TO L-CITRULLINE SUPPLEMENTATION



Look at most popular pre-workout supplements and you'll find they have several ingredients in common.

L-citrulline is one of them.

Its name comes from *citrullus*, the Latin word for watermelon, which is a natural source of it. Other food sources include peanuts, soybeans, and kidney beans.

Most supplements aren't all that special and can't live up to the hype, but, as you'll see, L-citrulline is one of the proven winners.

WHAT IS L-CITRULLINE?

L-citrulline is a non-essential amino acid, which means you don't necessarily have to get it from foods because the body can produce it as needed.

Physiologically speaking, L-citrulline plays a key role in the Urea cycle, which is the process whereby the body eliminates toxic byproducts of digesting protein and generating cellular energy.

WHY DO PEOPLE SUPPLEMENT WITH L-CITRULLINE?

The main reasons why people supplement with L-citrulline are improving heart health, blood flow, and endurance, and boosting muscle growth and recovery.

This is why it's a particularly popular supplement among athletes of all types.

It's also often chosen over another well-known molecule involved in the Urea cycle: L-arginine.

If you've heard of L-arginine, you probably know it as a "nitric oxide booster," but research shows it's unreliable in this mechanism (it works for some people but doesn't for others). The best that can be said about arginine is if you take enough (6 to 10 grams), it may or may not help you get more out of your workouts.

This explains why most nitric oxide supplements are very hit-and-miss – some people enjoy bigger pumps and better workouts and others notice absolutely nothing.

L-citrulline, on the other hand, is absorbed better than L-arginine and turns into it in the kidneys, resulting in larger and longer elevations of plasma (blood) arginine levels than supplementation with L-arginine itself.

It also elevates plasma levels of another amino acid, ornithine, which is also involved in the Urea cycle.

WHAT ARE THE BENEFITS OF L-CITRULLINE?

In the grand scheme of supplementation, L-citrulline is pretty obscure.

It doesn't get nearly as much attention as molecules like creatine, beta-alanine, and fish oil, but I think it deserves a bit more of the limelight because, as you'll see, it has quite a few science-backed health and performance benefits.

01. L-Citrulline Improves Physical Performance

Research shows that supplementing with L-citrulline can improve both your resistance and endurance training.

For example, in one study conducted with resistance-trained men, supplementing with 8 grams of L-citrulline before their chest workouts increased the number of reps they could do by 52%. It also significantly decreased post-workout muscle soreness.

02. L-Citrulline Improves Heart Health

Arteries are blood vessels that convey oxygenated blood throughout the body. They naturally contract and expand to control blood pressure, and it's vital that they retain their ability to do this because if they get too stiff and rigid or, even worse, blocked, it can result in a heart attack or stroke.

As nitric oxide plays a key role in maintaining arterial health and function, anything that boosts NO levels can help keep our arteries working the way that they should. And that's why research shows that L-citrulline can do just that.

Furthermore, it has also been shown to reduce blood pressure, which is another key factor in overall heart health.

03. L-Citrulline Helps with Erectile Dysfunction

Since it can influence blood flow, L-citrulline can help give guys harder boners (yeah, that's the technical term). It may not be as effective as erectile dysfunction drugs, but it also doesn't have any of the potential side effects.

04. L-Citrulline Reduces Free Radical Damage

Free radicals are atoms or groups of atoms that can, through chemical reactions, cause damage to cells in the body.

While free radicals play a vital role in certain basic physiological processes necessary for life, excessive amounts have been associated with aging, and age dependent diseases such as cardiovascular disease, cancer, neurodegenerative disorders, and other chronic conditions.

Everyday living inevitably results in the production of free radicals, and intense exercise spikes production as well (because it places the body under large amounts of stress).

Studies show that L-citrulline helps your body better deal with the exercise-induced uptick in free radical production by priming immune cells and reducing the number of free radicals produced while working out.

WHAT IS THE CLINICALLY EFFECTIVE DOSE OF L-CITRULLINE?

Now, when it comes to supplementing with L-citrulline, there are two widely available forms to choose from:

- ✓ L-citrulline
- ✓ Citrulline malate

And the only difference between them is citrulline malate is L-citrulline combined with malic acid, which is a natural substance found in many fruits that's involved in the creation of cellular energy.

I prefer and recommend citrulline malate over L-citrulline for two reasons:

- ✓ It's likely that malic acid confers additional health and performance benefits.
- ✓ It's the form used in most studies demonstrating the performance benefits associated with L-citrulline.

That is, there's no downside to citrulline malate and it's likely superior to just L-citrulline, at least for the purpose of having better workouts. So, with that out of the way, let's now look at the clinically effective doses of the two forms.

For non-exercise-related benefits, take 3 grams of L-citrulline or 5 to 6 grams of citrulline malate per day.

For improving exercise performance, take 3 to 5 grams of L-citrulline or 6 to 8 grams of citrulline malate per day.

WHAT KIND OF RESULTS SHOULD I EXPECT FROM TAKING L-CITRULLINE?

If you're excited about L-citrulline by now, I understand. There aren't many supplements that have been scientifically proven to improve both exercise performance and physical health.

Let's remember, though, that supplements don't build great physiques and healthy bodies. Dedication to proper training and nutrition does.

That said, here's what you can expect from L-citrulline (or, better, citrulline malate) supplementation:

- ✓ Improved circulation
- ✓ Bigger "pumps"
- ✓ More muscle endurance
- ✓ Higher energy in your workouts and less fatigue
- ✓ Decreased muscle soreness

DOES L-CITRULLINE HAVE ANY SIDE EFFECTS?

Since being discovered in 1930, there have been no reported side effects of supplementing with L-citrulline, even at high doses. That said, it's known to interact adversely with certain medications including nitrates and drugs for erectile dysfunction.

As with all supplements, it's better to be safe than sorry, so if you're taking any medications or are pregnant or breastfeeding, check with your doctor before jumping onto the L-citrulline bandwagon.

THE BEST L-CITRULLINE SUPPLEMENTS

L-citrulline is often found in pre-workout supplements, and now you know why.

Remember, though, if a pre-workout supplement contains less than 6 grams of citrulline malate per serving (and calls for one serving per day), don't buy it. It's underdosed. You want to see 6 to 8 grams and the closer to 8 grams, the better.

That also means you should stay away from supplements containing “proprietary blends,” because there’s no way for you to know the doses of each ingredient in the blends.

Now, if you’ve made it this far in the article, you’re probably not surprised to learn that my pre-workout supplement PULSE contains a clinically effective dose of 8 grams of citrulline malate per serving.

It also contains clinically effective doses of 5 other performance-enhancing ingredients:

- ✓ Caffeine
- ✓ Beta-alanine
- ✓ Betaine
- ✓ Ornithine
- ✓ Theanine

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