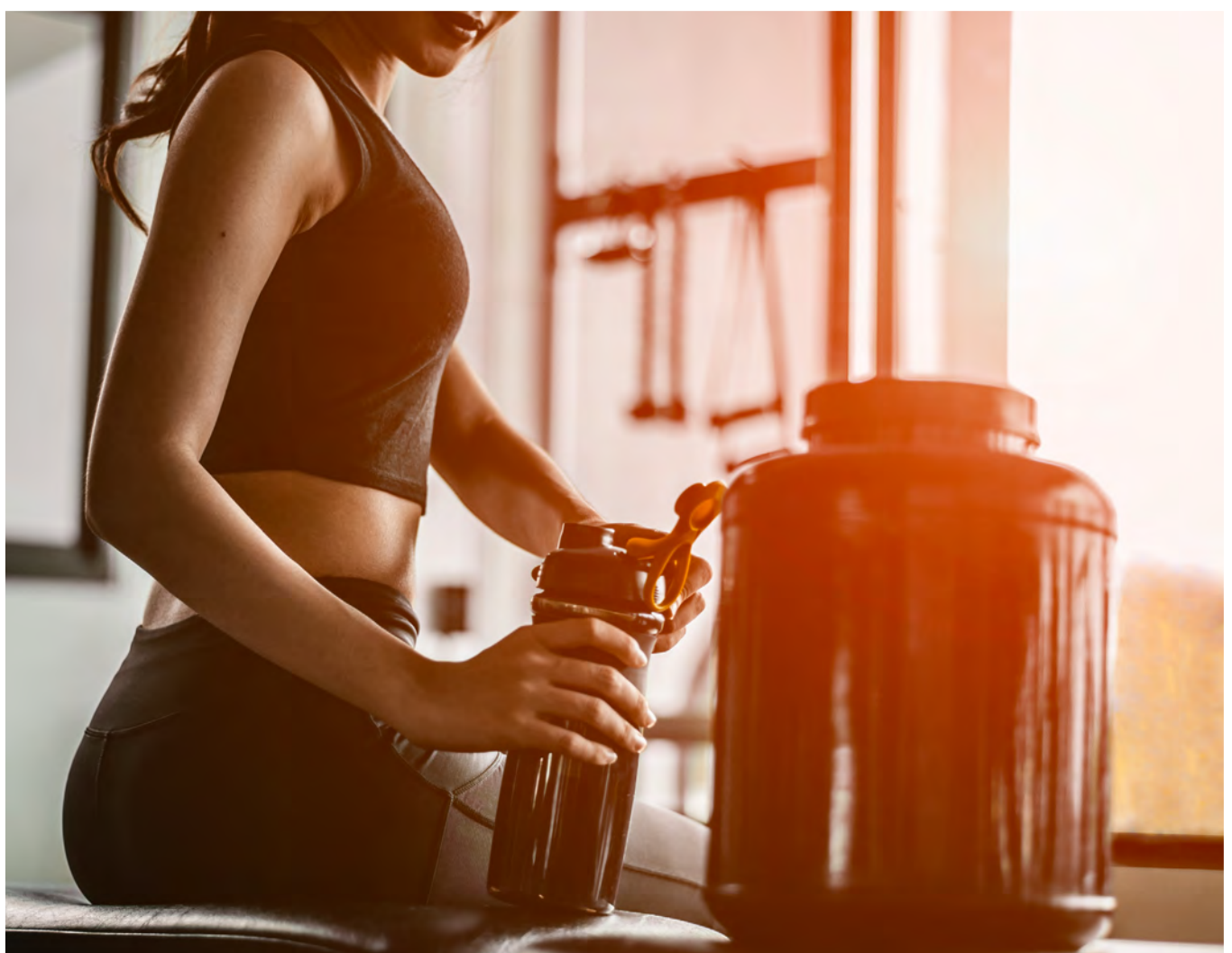


# Are These Workout Supplements Right For You?



INTERNATIONAL  
SPORTS SCIENCES  
ASSOCIATION

# Table of Contents

<b>Are Workout Supplements Right for You?</b>	<b>3</b>
• Dietary Supplements vs Fitness Supplements	4
• Common Reasons for Taking a Workout Supplement	4
• Do You Really Need Supplements When Working Out?	6
<b>Collagen Supplements: Effective in Fitness?</b>	<b>7</b>
• What Are Collagen Supplements?	8
• Benefits of Using Collagen Supplements	8
• Collagen Supplements vs. Collagen in Food	10
• Are There Any Risks?	10
<b>Glutamine Supplements: What You Need to Know</b>	<b>12</b>
• Benefits of Glutamine Supplement for Exercise	13
• Glutamine Supplements as Part of a Complete Diet	15
• Helping Clients Find a Safe Glutamine Dosage	15
<b>Amino Acids Supplements: Do They Work?</b>	<b>16</b>
• What Are Amino Acids and Essential Amino Acids?	17
• How Do Amino Acids Work for Weight Loss?	18
• The Limitations of BCAAs	19
<b>Supplements for Muscle Recovery</b>	<b>21</b>
• The Value of Supplements for Muscle Damage and Soreness	22
• 7 Supplements for Muscle Recovery	22
• When and How to Take Muscle Recovery Supplements	23

# Are Workout Supplements Right for You?



Supplementation recommendations are generally outside [a personal trainer's scope of practice](#). Especially if those suggestions are related to supplements used to treat an illness or disease. This sometimes creates a challenge because, as a health professional, clients may expect you to offer some guidance.

While referring them to a nutritionist or dietitian is often the best response, it is also helpful for you to understand some of the most common supplements within the fitness space.

## Dietary Supplements vs Fitness Supplements

Overall, dietary supplements are known to help improve total health and wellness. They provide the vitamins and minerals lacking or deficient in a person's diet. This enables the body to function at a more optimal level.

Fitness supplements can also help boost health. However, these nutrients are more appealing to active individuals for the way they can enhance a workout regimen. They're also fairly common.

## Common Reasons for Taking a Workout Supplement

What makes workout supplements so appealing to people who engage in regular exercise? Here are four reasons to consider.

### Increased Muscle Mass

Certain supplements help promote the growth of lean muscle. Protein is perhaps the most well-known for this purpose. Many bodybuilders end a grueling resistance routine with a muscle-building protein shake.

Protein is a basic building block for muscle. It also has other positive effects for active individuals. This includes [reducing food cravings](#), strengthening bones, and boosting metabolism.

Whey is a common protein supplement. This protein powder is often preferred because it is a 'complete protein.' This means that it contains all nine essential amino acids. It also has a lower amount of lactose than some other protein supplements.

Research <sup>(1)</sup> reveals that additional workout supplements promote muscle growth by impacting protein synthesis. Muscle protein synthesis refers to the process in which protein is made in the cells. Supplements that fall into this category are:

- **Glutamine.** An amino acid, glutamine is a protein building block that also supports healthy immune system function.
- **Creatine.** Some athletes take a creatine supplement to help improve muscle gain. This amino acid is also found in seafood and red meat.

- **Leucine.** Leucine is one of the branched chain amino acids (typically shortened to BCAA). In addition to helping the body create protein, a BCAA supplement increases muscle endurance by providing energy.
- **Calcium HMB.** HMB stands for beta-hydroxy-beta-methylbutyrate. It may promote muscle strength and reduce breakdown within the muscle cell.

## Better Athletic Performance

The Office of Dietary Supplements <sup>(2)</sup> reports that elite athletes often use supplements to boost athletic performance. Additionally, their usage rates are higher than those at lower levels of sport. This may be, in part, due to the duration and intensity of their training sessions.

Supplements found to potentially help improve performance include:

- **HMB.** HMB helps by aiding in muscle recovery. Especially when workout sessions are intense enough to damage the muscle tissue.
- **Betaine.** This sugar beet processing byproduct boosts both strength and power. It is thought to work by increasing the production of creatine. That makes it a good bodybuilding supplement.
- **Creatine.** Creatine supplementation supplies muscle with short-term energy. This helps athletes complete workouts designed to increase muscle power and strength.
- **Iron.** This nutrient can improve performance in individuals with iron deficiency anemia. It works by decreasing lactic acid during workout sessions.
- **Sodium bicarbonate.** Often used to help relieve heartburn, sodium bicarbonate may also enhance performance. This is particularly true for trained athletes because it reduces acid in the muscle. This reduces muscle fatigue.

## Aids in Weight Loss

Some athletes take workout supplements in an attempt to speed up fat loss. They want a substance that boosts their metabolism, reduces appetite, or otherwise hastens their ability to lose weight.

One of the most common ingredients in weight loss supplements is caffeine. Not only does caffeine help supply enough energy to make it through a workout but drinking coffee may aid in the fat metabolism process.

Green tea extract is also found in a lot of weight loss aids. It works by speeding up your metabolism. As a catechin, it helps the body break down your excess fat, using it as energy to fuel your workout sessions.

All of these may be good reasons to add a supplement to your exercise regimen. But that doesn't make them the right choice for everyone.

## Improved Muscle Recovery

Taking a supplement after your workout can also help your muscles recover. This recovery may be by reducing muscle soreness. It can also take the form of muscle repair, giving the damaged tissue the protein it needs to build and grow.

Here are a few of the supplements helpful to the body after intense workout sessions:

- **BCAAs.** [One study](#) found that individuals drinking 5.6 grams of BCAA after a workout had 22 percent higher muscle protein synthesis rates. Another [piece of research](#) notes that taking a BCAA can reduce muscle soreness up to 72 hours post-exercise.
- **Glutamine.** [A 2014 study](#) involved people who did unilateral knee extensions. Those taking L-glutamine showed faster recovery rates. They also had reduced muscle soreness. This effect was greater for the male participants.
- **Protein.** Ending your workout sessions with a protein powder or shake can help your muscles recover. Whey protein is absorbed the fastest, so it is the best for this purpose.
- **Omega-3 Fatty Acid.** Another supplement that aids in muscle repair is omega-3 fatty acids. [Research](#) reveals that they increase protein synthesis and regulate the breakdown of muscle protein. Fish oil is a common source of omega 3.

## Do You Really Need Supplements When Working Out?

If your regular nutrition and exercise programs are subpar, supplements likely won't make much of an impact. To gain muscle, you need to eat enough calories and protein, as well as implement a solid strength training program. Once your food and exercise routines are on point, then you may want to talk with your doctor about adding supplements.

Considering all these factors can help you decide whether you would benefit from taking a workout supplement. If not, you may have to focus more on getting all the nutrients you need via a healthy diet. In the end, it doesn't matter how much scientific support there is for a certain nutrient. If your body doesn't react well to it, you are better off leaving it alone.

You may also need to take a trial-and-error approach to learn which supplements support your workout regimen best. You may find [greater improvements in muscle strength](#) or recovery with one product over another.

To learn more about this topic, the ISSA offers a [Nutrition certification program](#). This course teaches how various nutrients can impact sports performance. It also covers what happens if these supplements are deficient or taken in excess. Upon completion of this course, you will be able to create customized nutrition plans based on individual needs.

### References

1. Kreider, R. (1999). Dietary Supplements and the Promotion of Muscle Growth with Resistance Exercise. *Sports Medicine*, 27(2), 97-110. <https://doi.org/10.2165/00007256-199927020-00003>
2. Office of Dietary Supplements - Dietary Supplements for Exercise and Athletic Performance. [Ods.od.nih.gov](https://ods.od.nih.gov). (2021). Retrieved 28 July 2021, from <https://ods.od.nih.gov/factsheets/ExerciseAndAthleticPerformance-HealthProfessional/>.



# Collagen Supplements: Effective in Fitness?



Collagen supplements are a common topic, especially related to weightlifting. Does this supplement really enhance muscle mass? And what exactly is it? If your clients start asking about collagen, make sure you have the facts: what's in collagen supplements, do they work, and what risks may be associated with using them.

Be sure to keep in mind your scope of practice as a personal trainer; stay current on what you can and cannot discuss with clients according to the rules of your state, city, gym, etc.

## What Are Collagen Supplements?

If you begin to look at supplements for collagen, you'll see a lot of different terms you may not understand. Before you can talk to your clients about them, it's important to know what they are:

- **Collagen.** Collagen is a type of protein and the most abundant protein in the human body. It provides a lot of the structure and elasticity in muscles, tendons, ligaments, skin, blood vessels, and connective tissues. As we age, collagen levels drop, which contributes to several signs of aging, like wrinkles and saggy skin, joint pain, stiffer tendons and ligaments, and weaker muscles.
- **Collagen peptides.** Peptides are simply smaller chains of amino acids, the building blocks of proteins. Proteins are very large molecules. Collagen broken down into smaller pieces is sometimes referred to as collagen peptides.
- **Collagen hydrolysate.** You'll see most supplements labeled as either collagen peptides or collagen hydrolysate. They are the same. Hydrolysate simply means the collagen has been hydrolyzed, or broken down into smaller pieces, also known as peptides. Collagen is hydrolyzed and turned into peptides for supplements to make it easier to absorb and digest.
- **Collagen supplements.** Labeled as collagen, collagen peptides, or collagen hydrolysate, collagen supplements are dietary supplements that provide this particular type of protein. Supplements are not necessary, as the body makes its own collagen and there is collagen in most well-balanced diets. The supplements are usually formulated as a powder that dissolves into liquids with no taste.

## Benefits of Using Collagen Supplements

Collagen levels drop naturally as we age, but it's also possible to have too little collagen as a result of a poor diet. Supplements can make up for some of this loss or deficiency.

Collagen products have mostly been marketed for improving skin condition and bone strength, but as evidence from research grows we're beginning to see collagen used for fitness and athletic performance.

So, does it work? Can you really see fitness improvements from increasing your collagen intake? The answer is a definite maybe. Here are some of the fitness benefits of collagen supplements that are backed by at least some research evidence.



## Reduce Joint Pain with More Collagen

Collagen is an important component of cartilage, the tissue that cushions and support joints. As we get older this tissue wears down, and the process occurs more rapidly in athletes. As cartilage wears away we experience joint pain and even arthritis.

Studies have shown that using collagen supplements can reduce joint pain and specific symptoms of osteoarthritis. One study looked at a group of 147 athletes over the course of 24 weeks. All had pain in their joints related to athletic activities. <sup>(1)</sup>

Seventy-three of the athletes were given collagen hydrolysate supplements. The rest got a placebo. The results showed that those who got the actual collagen experienced greater reduction in joint pain, both at rest and when walking.

If joint pain bothers you and limits how much you exercise, a solution like collagen supplements may be useful. Reducing joint pain can improve fitness by allowing for more mobility and simply being able to work out and train.

## Improving Muscle Mass

Collagen is an important component of muscles. One reason that muscle mass decreases with age is that collagen decreases. Research has already proven that collagen supplements can reverse this aging trend in people diagnosed with sarcopenia, age-related muscle loss.

The study specifically looked at elderly men with muscle loss, but the processes discovered could potentially apply to anyone. The researchers found that when men combined exercise with a post-workout collagen supplement, they built more muscle mass than those that exercised and received a placebo. <sup>(2)</sup>

Evidence that collagen supplements can increase muscle mass in younger, healthy people simply looking to supercharge their lifting workouts is limited. But, the proof that collagen plays such an active role building muscle means it is a possibility.

One reason collagen may help with muscle mass is that it contains the amino acids arginine and glycine, important building blocks for creatine. There is already plenty of evidence that creatine helps improve muscle mass, build strength, and improve athletic performance. <sup>(3)</sup>

## Collagen Supplements for Fitness May Enhance Recovery

Recovery can be a roadblock to improving fitness and hitting athletic goals. [Everyone needs recovery time](#), but it may be possible to speed that rest period using collagen. The recovery of muscles damaged during workouts depends on regenerating muscle fibers and producing scar tissue. Both of these processes require collagen, and collagen production is boosted during healing.

## Reduce Sports Injuries with Collagen

Injuries are not just painful, but they also slow you down in your fitness routine and athletics. If you can prevent injuries or get fewer, you have more time to train and improve. There are a lot of important ways to reduce the risk of injury, and collagen could be added to that list.

Some studies have shown that collagen supplementation increases the diameter of tendons in joints. One study looked at athletes and their ankles. The athletes were given collagen supplements or a placebo for six months. Those with the supplement had significantly lower rates of ankle injuries. <sup>(4)</sup>

## Collagen Supplements vs. Collagen in Food

It's always best to get your nutrients from a healthy, balanced diet, but there is still room for safe and effective supplementation.

Encourage your clients to look at their food choices first and to find ways to add more collagen before turning to supplements. Collagen is found in:

- Bone broth
- Chicken, pork, and salmon skin
- Egg yolk
- Foods with gelatin
- Certain cuts of meat, including oxtail, tendons, and knuckles

One reason to choose a supplement over whole foods is that collagen in supplements has been hydrolyzed, or broken down. The body can absorb and use it more easily this way.

For vegans and vegetarians, try foods rich in the amino acids glycine and proline, both crucial for producing collagen. These include soybeans and other legumes, and spirulina and agar, both derived from algae.

## Are There Any Risks?

Any type of supplement, even those that are substance from food like collagen, has the potential to pose health risks. Always take care when trying a new supplement and talk to your doctor first. Even if it seems like a safe substance, there may be reasons that you should not use it.

Collagen supplementation is generally considered safe, but there is not a lot of evidence one way or the other. The biggest potential risk is that these supplements may contain food allergens, including eggs, fish, and shellfish. If you have allergies, check ingredients carefully when selecting supplements.

A few other side effects people have reported with taking collagen are not too serious. These include a bad taste that lingers in your mouth and gastrointestinal issues like an unpleasant feeling of fullness or heartburn. <sup>(5)</sup>

Dietary supplements like collagen can be useful in improving health and supporting fitness and athletic performance. Collagen has a lot of potential, but make sure your clients understand that a supplement cannot make up for a poor diet. Always emphasize eating a well-rounded diet of whole foods as the foundation for good health and fitness.

Love the science of fitness and helping others achieve their goals? The ISSA's [\*\*Certified Personal Trainer – Self-Guided Study Program\*\*](#) is a great way to learn everything you need to begin working as a trainer, from strength training to cardio, nutrition, and more. The program provides the tools for being an informed personal trainer.

## References

1. Clark, K.L., Sebastianelli, W., Flechsenhar, K.R., Aukermann, D.F., Meza, F., Millard, R.L., Deitch, J.R., Sherbondy, P.S., and Albert A. (2008). 24-Week Study on the Use of Collagen Hydrolysate as a Dietary Supplement in Athletes with Activity-Related Joint Pain. *Curr. Med. Res. Opin.* 24(5), 1485-96. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/18416885>
2. Zdzieblik, D., Oesser, S., Baumstark, M.W., Gollhofer, A., and Konig, D. (2015). Collagen Peptide Supplementation in Combination with Resistance Training Improves Body Composition and Increases Muscle Strength in Elderly Sarcopenic Men: A Randomised Controlled Trial. *Br. J. Nutr.* 114(8), 1237-45. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4594048/>
3. Buford, T.W., Kreider, R.B., Stout, J.R., Greenwood, M., Campbell, B., Spano, M., Ziegenfuss, T., Lopez, H., Landis, J., and Antonio, J. (2007). International Society of Sports Nutrition Position Stand: Creatine Supplementation and Exercise. *J. Int. Soc. Sports Nutr.* 4(6). Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2048496/>
4. Dressler, P., Gehring, D., Zdzieblik, D., Oesser, S., Gollhofer, A., and Konig, D. (2018). Improvement of Functional Ankle Properties Following Supplementation with Specific Collagen Peptides in Athletes with Chronic Ankle Instability. *J. Sports. Sci. Med.* 17(2). Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5950747/>
5. Moskowitz, R.W. (2000). Role of Collagen Hydrolysate in Bone and Joint Disease. *Semin. Arthritis Rheum.* 30(2), 87-99. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/11071580>

# Glutamine Supplements: What You Need to Know



Glutamine (short for L-glutamine) is the most abundant amino acid in the human body. As an amino acid, it serves as a building block for protein. It stimulates protein synthesis and is essential for cell survival.

Generally, glutamine is not considered an essential amino acid. Yet, some health experts call it “conditionally essential.” This is because it serves a valuable purpose at certain times. One example of these times is when you’re under a high amount of stress.

[Research](#) reveals that glutamine is the most versatile of the 20 amino acids contained within a person’s genetic code. It assists with the exchange of gases between tissues. It helps stabilize other acids. It also aids in metabolic energy storage and generation.

Glutamine even serves as a substrate or substance used to create chemical reactions. In this way, it supports cell health and function. In fact, glutamine depletion has been found to lead to cell death. Amino acids positively impact the immune system. They make it easier to fend off illness and disease. Glutamine specifically offers many advantages in this regard.

For example, [some studies](#) have connected glutamine supplementation with faster wound healing. Another piece of [research](#) notes that this amino acid can potentially improve survival rates after a major infection.

While all of this sounds great, you may be wondering why it’s important for you to know all of this. Why do you need to know about glutamine? You’re a personal trainer, after all. Isn’t it more critical that you know how to help clients achieve weight loss and build their muscle?

Absolutely. You must know how to build muscle mass and increase calorie burn. But you also need to be aware of how supplemental glutamine can affect your clients and their workout. This enables you to provide the proper fitness guidance. It also gives insight into how they may respond.

## Benefits of Glutamine Supplement for Exercise

Why would an active individual want to begin glutamine supplementation? As it turns out, there are many reasons that extend beyond protein synthesis.

### Enhanced Immune Function

Athletes tend to be hard on their bodies. They push themselves to their physical limits. They’re always striving for [more muscle mass](#) or a trimmer figure. This is great for hitting goals and doing well in their sport of choice. It’s not so great for immune function.

Athletes are at a [higher risk of upper respiratory infections](#), especially during periods of heavy training. This is due to their immune system being weakened up to 70 percent post-exertion. Their body becomes more susceptible to infection setting in.



Glutamine supplementation can potentially offer a protective effect. It can help bolster immune function. This helps them stave off the latest bug. It also enables clients to stick to their fitness routine versus being sick in bed.

## Reduced Fatigue

Other [research](#) indicates that glutamine may help with fatigue. So, clients may take a glutamine supplement in the hopes that it will give them more energy. How does it work?

One [study](#) found that glutamine increased muscle glycogen by 16 percent. These glycogen levels remained elevated for two hours post-exercise. The body uses glycogen for energy. Give it more glycogen and workouts aren't as draining.

## Faster Muscle Recovery

Glutamine may also enhance exercise recovery. This is especially true if your client engages in eccentric exercise.

A [May 2018 study](#) looked at this very effect. The group taking oral glutamine and leucine recovered faster than the placebo group. This was determined after measuring multiple factors. Delayed-onset muscle soreness and creatine kinase were two.

If you work out hard, you create muscle damage. Glutamine may help repair muscle tissue damage at a faster rate.

## Potential Side Effects

Some people experience side effects with glutamine supplementation. [The University of Michigan](#) reports that these effects commonly include:

- Nausea or vomiting
- Gas
- Swelling of the hands or feet
- Muscle pain
- Joint pain
- Mild rash
- Dry mouth
- Runny nose
- Increased sweating

Taking the glutamine as suggested on the label may help reduce these effects. Taking the supplement at a specific time might help too.

The University states that the best time to take glutamine varies based on the form of supplementation. Glutamine powder is generally best when taken with food. Yet, an empty stomach may be better with glutamine tablets.

## Glutamine Supplements as Part of a Complete Diet

Glutamine supplementation is just one piece of the puzzle. It's not uncommon for clients to take multiple supplements in an effort to improve their health. They may take a [branched-chain amino acid](#) (BCAA) to help build muscle mass. Or they might take garcinia cambogia to drop body weight.

When working with clients who use glutamine supplementation, it's important to consider their entire dietary regimen. Help them understand each supplement they take and how they may interact with each other.

Also work with them so that they realize that many supplements can be found in certain foods. Adding these foods to their diet may make supplementation unnecessary. Foods with a higher glutamine concentration include:

- Protein sources such as chicken and fish
- Vegetables like cabbage, spinach, beets, and peas
- Beans and lentils
- Dairy
- Tofu

## Helping Clients Find a Safe Glutamine Dosage

Providing specific dosage instructions is likely outside your scope of practice as a personal trainer, but you can help educate your clients about safe glutamine levels. Point them to the research and let them make their own decisions.

Ready to learn more about how nutritional supplements can impact a client's training? The ISSA offers a [Nutritionist certification](#). This course covers the various aspects of nutrition and how it can affect athletic performance.

### References

1. "Recommendations To Maintain Immune Health In Athletes". Taylor & Francis, 2021, <https://www.tandfonline.com/doi/full/10.1080/17461391.2018.1449895>.
2. Cruzat, Vinicius et al. "Glutamine: Metabolism and Immune Function, Supplementation and Clinical Translation." *Nutrients* vol. 10,11 1564. 23 Oct. 2018, doi:10.3390/nu10111564
3. Sandra C. Blass, et al. "Time to wound closure in trauma patients with disorders in wound healing is shortened by supplements containing antioxidant micronutrients and glutamine: A PRCT." *Clinical Nutrition*, Volume 31, Issue 4, 2012, Pages 469-475, ISSN 0261-5614, <https://doi.org/10.1016/j.clnu.2012.01.002>.
4. Philip Newsholme, Why Is L-Glutamine Metabolism Important to Cells of the Immune System in Health, Postinjury, Surgery or Infection?, *The Journal of Nutrition*, Volume 131, Issue 9, September 2001, Pages 2515S–2522S, <https://doi.org/10.1093/jn/131.9.2515S>
5. Neil P. Walsh (2018) Recommendations to maintain immune health in athletes, *European Journal of Sport Science*, 18:6, 820-831, DOI: 10.1080/17461391.2018.1449895
6. Coqueiro, Audrey Yule, Marcelo Macedo Rogero, and Julio Tirapegui. "Glutamine as an Anti-Fatigue Amino Acid in Sports Nutrition." *Nutrients* 11.4 (2019): 863. Available: <http://dx.doi.org/10.3390/nu11040863>.

# Amino Acids Supplements: Do They Work?



Most of the hype about amino acid supplementation comes from the weight room where serious lifters use BCAAs to improve muscle development post-workout. But now there may be some proof that amino acid supplements, not just protein supplements, could support weight loss.

Always be sure to stay within your scope of practice as a personal trainer. But also make sure you're up to date on the latest trends and science surrounding the world of health and fitness. So, here's what you need to know if your clients ask about taking amino acid supplements.

## What Are Amino Acids and Essential Amino Acids?

Amino acids are small molecules that link together to make larger protein molecules. They are often referred to as the building blocks of proteins. There are 20 amino acids the human body needs to grow and function. Eleven of these we can metabolize, but nine must be consumed. These nine are the essential amino acids, or EAAs:

1. Histidine
2. Isoleucine
3. Leucine
4. Lysine
5. Methionine
6. Phenylalanine
7. Threonine
8. Tryptophan
9. Valine

All animal products—meat, poultry, fish, dairy, eggs—contain the essential amino acids. To get all the EAAs in a plant-based diet it is important to eat a variety of foods that contain some number of the nine: whole grains, legumes, vegetables, seeds, and nuts. Soy, quinoa, and buckwheat are the only plants that have all the EAAs and make a complete protein.

Amino acids play a number of important roles in the body and for good health, not least of which is in the building and maintenance of proteins and muscle tissue. Other reasons we need these molecules in our diets include:

- Synthesizing hormones
- Synthesizing neurotransmitters
- Regulating immune function
- Producing and regulating energy
- Building structural proteins for connective tissue in joints and skin
- Absorbing essential minerals
- Regulating blood sugar
- Protecting nerve cells

It isn't difficult for most people to get enough amino acids through their diet. But, many choose to supplement protein or even specific amino acids. You can find supplements for specific single amino acids or for groups of amino acids, such as the EAAs.

## How Do Amino Acids Work for Weight Loss?

There are many studies that have investigated the potential for amino acid supplementation to support muscle development and weight loss. How these molecules fuel greater weight loss is complicated, but there are a few possible answers:

### Amino Acid Supplements May Boost Performance

One way supplementing with amino acids may help you lose more weight is through a boost in exercise performance. If these supplements can give you more energy, relieve fatigue, and improve recovery times, you can maximize workouts to burn more calories and lose weight.

There is some evidence from research that amino acid supplements do just that. A study of 16 athletes found that supplementing with amino acids improved strength training performance, improved recovery after workouts, and reduced soreness in muscles post-workout. <sup>(1)</sup>

### Increasing the Fat Burn

Multiple studies have shown that there may be a boost in fat burning when you supplement with amino acids. An increase in metabolizing fat will definitely lead to greater weight loss if it truly works. One study showed that daily amino acid supplementation decreased the percentage of body fat in men already heavily involved in strength training. The decrease was significant compared to men who used whey protein or just sports drinks after workouts. <sup>(2)</sup>

Unfortunately, there have been other studies looking to find out if amino acid supplementation can burn more fat, but with mixed results. There needs to be more work and better studies to find out if it is really the supplement that promotes [fat loss](#) or if there are other factors involved.

### Using Amino Acids for Weight Loss May Promote Muscle Building

The potential ability of amino acid supplements to increase fat burn may be related to muscle growth. The more muscle mass you have, the greater the potential you have for losing fat and burning calories. Muscle tissue uses more energy than fat tissue, so as you build up muscle, your metabolism revs up and you burn more calories.

So, if amino acid supplementation can help you build more muscle, it can potentially boost weight loss. The key here may be to supplement with BCAAs, or branched-chain amino acids. Of the nine essential amino acids, three have a structure with branched chains: isoleucine, leucine, and valine. Leucine may be the most important of them all in terms of muscle growth.



There is evidence that these three amino acids play a bigger role in muscle building than the others, which is why BCAA supplements have become so popular in the weight room. Studies have shown that these amino acids may improve muscle development by activating certain enzymes after a workout. <sup>(3)</sup>

Researchers have also shown that BCAAs can help you maintain muscle mass even while restricting your diet. <sup>(4)</sup> This may mean these supplements are especially helpful in weight loss programs.

## **Stimulating Growth Hormone**

Somatotropin, or STH, is a growth hormone that the body produces mostly at night, during sleep. It stimulates the building of protein from amino acids and the oxidation of fat. One way to burn fat and lose weight is to have more of this growth hormone. But you can't just get a supplement or injection of it. What you may be able to do is supplement with the amino acids that stimulate the secretion of STH.

The essential amino acid methionine, and the non-essential amino acids arginine and glutamine, may be able to do this and promote weight loss. There is some evidence that taking these amino acid supplements on an empty stomach before bed can increase STH secretion and fat loss.

## **Blocking Fat Storage with Glutamine**

There may be another reason to supplement with glutamine for greater weight loss. Glutamine can actually be converted to glucose, the sugar that provides the body's main source of energy, and do so without impacting the hormones that stimulate fat storage.

This means that glutamine can provide energy without pushing the body to store extra energy as fat. It may also reduce cravings for some of the foods that tend to make us fat in the first place, namely sugar and alcohol.

# **The Limitations of BCAAs**

The evidence supporting the role of BCAAs in muscle development is strong, and this is already a popular supplement with weightlifters. But there is also proof that these three amino acids alone are not enough. What you really need to build muscle to support weight loss is all of the nine essential amino acids.

A study from 2017 supplemented participants with BCAA or a placebo after strength training workouts. The researchers concluded that BCAA supplementation does improve muscle growth, but that it has a limit. The better way to maximize gains in muscle tissue after working out, according to this study, is to supplement with all the essential amino acids, not just BCAAs. <sup>(5)</sup>

A better choice, if you want to supplement with amino acids, is to find a product that includes all the EAAs, not just the BCAAs. There may be some added benefit to choosing an EAA supplement that includes extra BCAAs, especially leucine.

Want to learn more about the science behind weight loss and building muscle? When you're ready to take the plunge, try ISSA's [\*\*Certified Personal Trainer – Self-Guided Study Program\*\*](#). It will prepare you to work as a professional trainer, and you get to learn at home and at your own pace.

## References

1. Waldron, M., Whelan, K., Jeffries, O., Burt, D., Howe, L., and Patterson, S.D. (2017). The Effects of Acute Branched-Chain Amino Acid Supplementation on Recovery from a Single Bout of Hypertrophy Exercise in Resistance-Trained Athletes. *Appl. Physiol. Nutr. Metab.* 42(6), 630-6. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/28177706>
2. Stoppani, J., Scheett, T., Pena, J., Rudolph, C., and Charlesbois, D. (2009). Consuming a Supplement Containing Branched-Chain Amino Acids During a Resistance-Training Program Increases Lean Mass, Muscle Strength, and Fat Loss. *J. Int. Soc. Sports Nutr.* 6(Suppl 1). Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3313152/>
3. Blomstrand, E., Eliasson, J., Karlsson, H.K.R., and Kohnke, R. (2006). Branched-Chain Amino Acids Activate Key Enzymes in Protein Synthesis after Physical Exercise. *The Journal of Nutrition.* 136(1), 269S-73S. Retrieved from <https://academic.oup.com/jn/article/136/1/269S/4664134>
4. Dudgeon, W.D., Kelley, E.P., and Scheett, T.P. (2016). In a Single-Bind, Matched Group Design: Branched-Chain Amino Acid Supplementation and Training Maintains Lean Body Mass During a Caloric Restricted Diet. *J. Int. Soc. Sports Nutr.* 13(1). Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/26733764>
5. Jackman, S.R., Witard, O.C., Philp, A., Wallis, G.A., Baar, K., and Tipton, K.D. (2017). Branched-Chain Amino Acid Ingestion Stimulates Muscle Myofibrillar Protein Synthesis Following Resistance Exercise in Humans. *Front. Physiol.* Retrieved from <https://www.frontiersin.org/articles/10.3389/fphys.2017.00390/full>

# Supplements for Muscle Recovery



[Workout recovery](#) is arguably as important as the workouts themselves. Any time you push muscle past its normal level, it creates a tiny tear in the muscle tissue. It is the repair of this tear that leads to muscle growth.

If the muscle isn't allowed to recover, you won't see gains in muscle mass. You may also notice reduced muscle strength. This makes it a struggle to get through your workouts. It can also show up as a lack of progress.

Giving adequate time for muscle repair helps reduce overuse-related muscle breakdown and reduces the risk of injury.

While taking time off gives muscle fibers time to heal, a workout supplement can assist. What value do these substances have to offer? Two of the most compelling are their ability to heal muscle damage and reduce sore muscles.

## The Value of Supplements for Muscle Damage and Soreness

Some supplements work by supporting or enhancing muscle protein synthesis. Protein synthesis refers to the process that muscle cells use to make more protein. Protein is the building block for muscle. Thus, promoting protein synthesis gives the body more blocks to use.

Other supplements aid in muscle recovery in a way that reduces muscle soreness. Sore muscles are fairly common for new exercisers. It's also common for those who have taken their strength training routine up a notch. Soreness that occurs quickly after the workout is often due to lactic acid buildup. Then there is delayed onset muscle soreness, or [DOMS](#), which is longer lasting.

Some supplements ease both types of sore muscles. Some work by helping the body get rid of lactic acid faster. This is beneficial for acute muscle soreness. Others help by speeding the recovery process. This reduces the likelihood that the muscle soreness will last long term.

Still more supplements work to reduce muscle fatigue. They give muscle cells the energy they need to keep going while they recover. Some even aid in injury recovery. This type of workout recovery supplement provides the nutrients needed to repair muscle damage.

## 7 Supplements for Muscle Recovery

What type of recovery supplement is best for you or your clients? A lot of it depends on the client and their goals. While you, as a personal trainer, may not be able to prescribe supplements to your clients, you can help educate them about some of their options. Here are seven to consider.

- **Protein supplement.** Protein is perhaps the most useful supplement for muscle recovery. It helps the muscle repair faster and more effectively after a grueling workout. It is even more important if there isn't enough protein in the diet. [Whey protein](#) is the most popular choice. This may be because whey protein also includes essential amino acids. A typical whey protein powder offers 25 grams per serving, though some provide more. Other options include soy, egg protein, rice, hemp, and pea protein.

- **Branched-chain amino acid (BCAA) supplement.** Though the body can make some amino acids on its own, there are a few it cannot make. An amino acid falling in the second category is an essential amino acid. A BCAA supplement provides these essential amino acids. This aids in recovery. This type of supplement also promotes muscle growth while reducing muscle fatigue. It can even help ease sore muscles.
- **Fatty acid supplement.** Another good supplement for muscle recovery is fatty acids. They supply energy, but also reduce inflammation. A medium-chain triglyceride (MCT) fatty acid helps by reducing lactic acid buildup. An omega 3 fatty acid reduces muscle fatigue and muscle soreness. It also offers injury protection. To maintain their safety and quality standards, fatty acid supplements should be stored in a dark, cool place.
- **Creatine supplement.** Creatine turns into creatine phosphate, which the body uses for energy. Though research is somewhat mixed, some studies have found that taking a creatine supplement may aid in muscle recovery. [One](#) noted that taking creatine resulted in greater muscle strength during the recovery process. [Another](#) showed that it may even boost performance.
- **Citrulline malate supplement.** When taken as a supplement, citrulline—a non-essential amino acid that is also found in watermelon—converts into nitric oxide. Nitric oxide helps open blood vessels, thereby improving blood flow. This makes it easier to get blood and other nutrients to the muscle, speeding their recovery. [Research](#) reveals that citrulline also improves the bioavailability of L-arginine. L-arginine is another amino acid that aids in protein synthesis.
- **Magnesium supplement.** Magnesium assists with muscle recovery by helping them relax. In fact, if you don't have enough magnesium, you have a greater chance of having muscle cramps. Taking a magnesium supplement helps support healthy muscle contraction.
- **Tart cherry juice extract.** Some exercise enthusiasts swear by tart cherry juice for full muscle recovery. This extract works by reducing inflammation in the muscle. While some inflammation is good, too much leads to increased muscle soreness. High levels of inflammation can also increase injury risk.

It should be noted that taking a multivitamin regularly can boost recovery too. This all-inclusive vitamin contains calcium and vitamin D, both of which help create strong muscle and bones. Vitamin A promotes protein synthesis and CoQ10 reduces muscle fatigue. While this type of vitamin isn't necessarily as powerful as the others mentioned, it is part of a healthy supplemental plan.

## When and How to Take Muscle Recovery Supplements

After a client selects the supplement or supplements that could be the most beneficial for them, the next step is to come up with a schedule for taking them. When it comes to using a muscle recovery supplement, there are two basic options. It can either be a pre-workout supplement or a post-workout supplement.

The best time to take a specific supplement changes based on the type of supplement taken. Some provide more benefits when used before an exercise session. Others are more effective when used for post-workout recovery.



As an example, [one study](#) involved the use of creatine monohydrate. It found that more benefits were obtained when used as a post-workout supplement. BCAAs taken as a bodybuilding supplement are generally best when consumed before the exercise starts.

Recommendations about how much to take vary as well. For instance, magnesium is one supplement you don't want to take too much of. [The Office of Dietary Supplements](#) recommends not exceeding 310 mg for those in the 19-30 age range or 310 mg for 31 and up. Taking in more can cause diarrhea. And if you exceed the recommendations too much, it can be fatal.

For this reason, it is recommended that you talk with your doctor before starting any new supplement regimen. This helps ensure that the substance is safe for you to take given your health and medical conditions. Once you have clearance, work them into your diet slowly. This helps minimize negative side effects.

ISSA's [Nutrition Coach certification](#) teaches more ways to improve muscle recovery with the proper diet. Health comes from within, so you need to fuel your body RIGHT. Find out how to produce the best wellness results as an ISSA Nutritionist.

## References

1. Cooke, Matthew B, Emma Rybalka, Andrew D Williams, Paul J Cribb, and Alan Hayes. 2009. "Creatine Supplementation Enhances Muscle Force Recovery After Eccentrically-Induced Muscle Damage In Healthy Individuals". *Journal Of The International Society Of Sports Nutrition* 6 (1): 13. doi:10.1186/1550-2783-6-13.
2. Casey, A., D. Constantin-Teodosiu, S. Howell, E. Hultman, and P. L. Greenhaff. 1996. "Creatine Ingestion Favorably Affects Performance And Muscle Metabolism During Maximal Exercise In Humans". *American Journal Of Physiology-Endocrinology And Metabolism* 271 (1): E31-E37. doi:10.1152/ajpendo.1996.271.1.e31.
3. Gonzalez, Adam M., and Eric T. Trexler. 2020. "Effects Of Citrulline Supplementation On Exercise Performance In Humans: A Review Of The Current Literature". *Journal Of Strength And Conditioning Research* 34 (5): 1480-1495. doi:10.1519/jsc.0000000000003426.
4. Antonio, J., & Ciccone, V. (2013). The effects of pre versus post workout supplementation of creatine monohydrate on body composition and strength. *Journal Of The International Society Of Sports Nutrition*, 10(1). <https://doi.org/10.1186/1550-2783-10-36>
5. Office of Dietary Supplements - Dietary Supplements for Exercise and Athletic Performance. Ods.od.nih.gov. (2021). Retrieved 28 July 2021, from <https://ods.od.nih.gov/factsheets/ExerciseAndAthleticPerformance-HealthProfessional/>.