Amino, the most advanced cutting-edge amino acid formulation on the market today, maximizes protein synthesis by providing you with a quick and potent boost of anabolic and anticatabolic hormones and amino acids.

The high systemic levels of amino acids and other synergistic ingredients provided by Amino has a direct effect on increasing protein synthesis, and at the same time increases systemic levels of the potent anabolic hormones and growth factors, including insulin, testosterone, growth hormone and IGF-I.

Amino is formulated to maximize protein synthesis and is especially useful before exercise for minimizing protein catabolism during and after exercise for maximizing the anabolic effects of exercise and enhancing recovery.

As well, it can also be used to boost protein synthesis and energy metabolism anytime during the day, making it especially useful for those wishing to cut back on calories in order to maximize body composition by helping to decrease body fat while at the same time sparing muscle.

Formulated by Mauro Di Pasquale, M.D.

Dr. Di Pasquale is a licensed medical doctor, an author, a former world champion, a former professor at the University of Toronto, and actively involved in researching, writing, and practicing in the weight loss, fitness, body composition, sports performance, and fitness fields for over five decades.
Crucial Essential Amino Acid Mix

**Amino** version IV contains:

- The exact mix and quantity of essential amino acids that in research studies have been shown to maximize post exercise protein synthesis.\(^{12}\)

- High amounts of branched-chain amino acids (BCAA), which have been shown to stimulate protein synthesis before and after training. BCAA have also been shown to increase resistance to fatigue and enhance lipid oxidation (fat burning) during exercise in those who are glycogen-depleted.\(^3\) This means that Amino is especially useful for those who follow my phase shift diets in which pre-exercise glycogen depletion exists in the low carb phase. Studies have also recently shown that glycogen depletion prior to exercise enhances fat metabolism, speed and endurance.\(^{4,5,6}\) It's also my view that glycogen depletion before training, if you’re on my phase shift diets, also enhances the effects of training on body composition and strength.

- The conditionally and non-essential amino acids that have been shown to be most used for protein synthesis in muscle (serving not only as direct substrates but also sparing the conversion of these amino acids from the essential ones). While the presence of essential amino acids is critical to protein synthesis, there is some evidence that lack of the nonessential amino acids can result in lower plasma levels of these amino acids\(^7\) which may ultimately compromise protein synthesis in situations where there is rapid growth.

- My Amino Proprietary Complex (APC), a proprietary blend of several ingredients, which along with other ingredients in Amino maximizes mitochondrial anaplerotic flux in the TCA cycle resulting in increased ATP production and increased energy availability for protein synthesis and other functions, including the formation of phosphocreatine.

- Measured amounts of several anapleurotic and other ingredients, including calcium alpha ketoglutarate, arginine aspartate, potassium succinate, citrulline malate, magnesium fumarate and adenosine monophosphate (AMP) that impact on TCA flux and which I feel, maximize mitochondrial metabolism, increase aerobic energy production, and enhance insulin and growth hormone/IGF-I secretion and formation.
One dose – 12 tablets contains:

Amino Acid Content

A total of 16.5 grams of amino acids in the form of free amino acids, amino acid derivatives and metabolites, and peptides. The breakdown is as follows:

- 11.2 grams of Essential Amino Acids (EAA)
- 5.8 grams, or over 50%, of the EAA are in the form of branched chain amino acids (BCAA) – half of the BCAA is in the form of leucine.
- 2.4 grams of the conditional amino acid glutamine
- .6 grams of the conditional amino acid arginine
- 0.5 grams of taurine
- 325 mg of alanine
- 4.3 grams in total of non-essential and conditional amino acids, Krebs Cycle intermediates, and related compounds.

Besides the amino acid content Amino also contains several Ingredients that enhance the effects of the amino acids in Amino. This combination of ingredients is enough to make Amino the most effective amino acid supplement on the market today.

Amino, while formulated to be the ultimate post training supplement, can also be used at other times of the day. An increase in protein intake by itself has been shown to not only increase protein synthesis and decrease muscle breakdown, but has also been shown to increase both aerobic and anaerobic performance. But Amino does much more than simply increasing protein intake.

Amino provides a square wave systemic increase in amino acids that translates into an increase in protein synthesis, which in turn keeps the body in an anabolic state. As such it’s perfect as a snack between meals, especially if you’re trying to reduce body fat.

Because of the way Amino is formulated, it’s especially useful for anyone trying to maximize muscle mass while at the same time minimize body fat.
Amino version IV

Version IV of Amino represents the ongoing improvement of the best amino acid supplement on the North American and International markets. Amino IV represents a new paradigm and is a quantum leap above all other amino acid products.

In keeping with the aim of maximizing protein synthesis and anabolic processes the formulation for amino has been improved, with more of some of the ingredients, and over a dozen new ingredients. The new formulation further enhances various pathways involved in increasing protein synthesis, decreasing protein catabolism and increasing recovery.

For example, **vitamin D** has been added since this vitamin has recently been shown to enhance protein synthesis and have specific anabolic effects.

The amount of **L-leucine** has been more than doubled since it’s been shown that leucine has major regulatory effects on protein synthesis. Amino contains over 5 grams of branched-chain amino acids per dose (both free and in the form of peptides), with over half of it in the form of leucine.

Also while of the BCAAs leucine seems the most important, it’s also paramount that the other two BCAAs also be present in the formulation since supplementation with leucine alone may have side effects due to impairment in the availability of valine and isoleucine. This is because the activity of the rate-limiting enzymatic complex in BCAA degradation, i.e., branched-chain alpha-keto acid dehydrogenase, is markedly stimulated by the presence of leucine or its keto acid, alpha-ketoisocaproate, which in turn decreases the availability of endogenous valine and isoleucine if they’re not included in the formulation. 9,10,11

**L-glutamine** has been added to supplement the amount already present in the glutamine peptides. This adds free glutamine to peptide bound glutamine and maximizes absorption and utilization of glutamine.

**Vitamin B6** and **Vitamin C** have been added since both are crucial for optimizing protein synthesis and recovery of the neuromuscular system secondary to exercise stress.

**Carnosine** (beta-alanyly-L-histidine) was added to Amino because of its powerful antioxidant and anti-inflammatory effects, as well as its effects on healing and recovery. 12,13,14,15,16,17 As discussed exercise is a catabolic process. Ordinarily this catabolic process continues even though exercise is stopped. Carnosine has an immediate effect on helping to change the catabolic state to one that’s anabolic and aiding recovery in this and other ways. It also has beneficial effects on muscle damage and on increasing blood flow in muscle. 18

Carnosine has beneficial effects on exercise performance by helping to overcome muscle fatigue, likely due its effectiveness as a buffering agent, and perhaps its antioxidant, chelating,, and enzyme regulating effects. 19
Carnosine levels tend to be higher in athletes such as sprinters\textsuperscript{20,21} and in bodybuilders\textsuperscript{22}. These studies also show that intramuscular carnosine may be an effective physiological H+ buffer and that there is a significant relationship between the carnosine concentration in human skeletal muscle and high intensity exercise performance. A recent study found that beta-alanine supplementation increased muscle carnosine levels\textsuperscript{23} and resulted in an improvement in exercise performance.\textsuperscript{24}

However, since dietary carnosine is absorbed across intestinal epithelial cells, using carnosine itself is a more direct approach to increasing carnosine levels compared to using beta alanine which is used in producing endogenous carnosine.

**Citrulline Malate (CM)**, a mixture of citrulline and malate, was added for several reasons. Citrulline has several effects, including increasing ammonia clearance, increasing bicarbonate, ornithine, arginine, and citrulline levels. Malate, a tricarboxylic acid cycle (TCA) intermediate, has beneficial effects on energy metabolism mainly by facilitating aerobic ATP production through anaplerotic reactions.

Overall, studies suggest that citrulline malate supplementation can boost athletic performance and enhance recovery by eliminating the amino acid breakdown products of protein metabolism and augmenting the detoxifying capacity of liver cells in removal of ammonium and lactate from the blood.\textsuperscript{25,26,27,28,29,30,31} These actions decrease fatigue, enhance recovery and facilitate the shift from the catabolic training state to the post exercise anabolic state.

Adding to the effect on energy metabolism is the presence of **arginine**, **glycine** and **methionine** in Amino. That’s because creatine can be produced endogenously via a two-step process involving these three amino acids.

As well, the combination of arginine and glycine, along with the ketoisocaproic acid (GAKIC) that is formed from leucine, make up a trio that has been found to be a useful combination if used after exercise, and before doing any further exercise.\textsuperscript{32}

Besides the beneficial effects of the above and other added ingredients, Amino IV has a host of other ingredients that together make Amino IV the premier amino acid supplement.

**Summary**

Amino, used before and immediately after training is an easy to take, easy on the stomach, source of amino acids and other ingredients that kicks protein synthesis into high gear. As such, you can begin taking advantage of it’s effects on countering protein catabolism while exercising, and that post-training window of opportunity. Amino is formulated to provide a square wave increase in the availability of blood amino acids and synergistic compounds within minutes after ingestion, and a measurable decrease in protein catabolism and increase in muscle protein synthesis within less than half an hour – much faster than other pre and post exercise supplements.
The amino acid, peptide blend, and special ingredients in Amino work together synergistically to immediately increase blood amino acid levels, insulin sensitivity and insulin levels, as well as growth hormone, IGF-I and testosterone levels, resulting in increased muscle protein synthesis which maximizes the anabolic and fat burning effects of exercise and combats overtraining.

Amino can also be used throughout the day to give a rapid pulsed increase in amino acids and anabolic hormones that leads to short burst increases in muscle protein synthesis. Research has shown that pulses of high levels of amino acids are much more effective in increasing protein synthesis than sustained high levels.

The bottom line is that the new Amino version IV will stimulate GH and IGF-1 levels, and increase insulin sensitivity. These hormonal changes, along with a rapid increase in amino acids results in a dramatic increase in protein synthesis and fat loss, decrease muscle degradation, improve recovery, increase energy, and result in an anabolic kick whenever it’s used, especially before and right after training.
MD+ Amino version IV

1. Maximizes protein synthesis and decreases muscle breakdown after training and anytime it’s used.
2. Maximizes the anabolic and fat burning effects of exercise.
3. Enhances recovery.

Amino version IV Supplement Panel

<table>
<thead>
<tr>
<th>Supplement Facts:</th>
<th>Serving Size: 12 Tablets</th>
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<tbody>
<tr>
<td></td>
<td>Servings Per Container: 15</td>
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<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount Per Serving</th>
<th>% Daily Value*</th>
<th>Amount Per Serving</th>
<th>% Daily Value*</th>
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<tbody>
<tr>
<td>Vitamin C (Ascorbic Acid)</td>
<td>100 mg</td>
<td>170%</td>
<td>Taurine</td>
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<td>Vitamin D3 (Cholecalciferol)</td>
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<td>Vitamin B1 (Thiamin HCl)</td>
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<td>Vitamin B2 (Riboflavin)</td>
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<td>Vitamin B6 (Pyridoxine HCl)</td>
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<td>Vitamin B12 (Cyanocobalamin)</td>
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<td>Biotin</td>
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<td>Calcium (as Calcium Phosphate)</td>
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<td>Chromium (as Amino Acid Chelate)</td>
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<td>Selenium (as L-Selenomethionine)</td>
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<td>L-Glutamine</td>
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<td>N-Acetyl-L-Cysteine</td>
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<td>L-Isoleucine</td>
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<td>Amino™ Proprietary Complex (APC) 3,519 mg</td>
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<td>L-Leucine</td>
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*Amino™ Proprietary Complex (APC) 3,519 mg

*Daily Value Not Established

Other Ingredients: Stearic Acid, Modified Cellulose Gum, Magnesium Stearate, Titanium Dioxide, Hypromellose, Hydroxypropyl Cellulose, Silicon dioxide
References:
(See also http://www.metabolicdiet.com/pdfs/amino_ref.pdf)

Amino Product Information