

The Complete Workout Supplements Guide You Need to Read

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This is the most comprehensive workout supplement guide online.

In it, you'll learn everything you need to know ranging from protein powders and BCAAs, all the way to multivitamins, pre-workouts, and more.

First and Foremost: Do You Need any Supplements to Get Results?

What exactly are supplements and are they the holy grail of results? Are they an irreplaceable part of the whole fitness journey? Can they bring you results, without you having to put (as) much effort?

The answer to all these questions is a firm NO. You don't need supplements to make great gains and achieve the height of your genetic potential. And they don't have the magic power to outdo bad nutrition half-hearted training.

But..

They can play their helpful part in the whole process and give you a slight edge.

What most people get wrong is thinking that supplements are 30-50% of what it takes to make great gains. In reality, they are more like 10%.

Supplements are by no means good or bad. They are there to serve a specific purpose – to supplement the effort that already goes into training and diet.

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CHAPTER 1

SUPPLEMENT MYTHS

There are a lot of popular misconceptions of what supplements are and what they do. Moreover, there are a lot of people who are more than happy to spread these lies around. Let's take a look at some of the most popular gems:

Supplements are steroids.

There's a general misconception that supplements like protein powder and creatine are steroids. People who are not familiar with supplements and don't know the first thing about lifting are usually the ones who believe this myth. But, I've also come across fellow gym bros who do, as well.

First off, there is nothing similar between most supplements and actual steroids. Secondly, steroids [deliver much more noticeable results](#) for muscle growth compared to a supplement. And third, steroids are quite dangerous to take compared to a well-researched supplement like creatine and protein powder.

So no, supplements are nowhere near steroids for the results they can deliver and the risk they carry.

Testosterone boosters work.

[Testosterone levels](#) declining is no secret in recent years. But, the claims most supplement companies make about their products are false. And, taking this in consideration, it doesn't make testosterone boosters any more useful. They usually slap a big, shredded dude on the label and call their booster the holy grail of muscle growth.

In reality, most of these products are completely worthless. There are much better ways to maintain optimal testosterone levels:

through proper nutrition, working out, recovering well and managing stress.

I have dedicated a whole point in this guide, debunking this common myth.

Latest & greatest formula is what is always best.

Certain supplements like creatine seem to be getting a 'facelift' every 6 months. You can look around and I bet you're going to see more than 10 variations of a simple supplement.

Most supplement companies try to create hype about their 'new formula', claiming that it's better than the previous. That usually results in more sales and more revenue.

But, what you need to understand is that these companies are biased. After all, that is their product they're trying to sell. And believing every word they say isn't always in your best interest. Understand that sometimes the 'new and improved' formula that costs more isn't always best.

What you should do instead is look at the ingredients and dosages to make an informed decision. Just because they slap a shiny new label and charge more doesn't mean it's going to benefit you more.

The more expensive it is, the better.

This kind of ties in with the previous myth but the difference here is the product doesn't have to be newer. Certain supplements have more expensive variations and a famous example of that is creatine.

Because there are so many supplements out there, I won't try to cover any of them. I'll just give creatine as an example:

We start with a simple and effective creatine monohydrate. Then we move to buffered creatine, and then ethyl ester, and liquid, and get to a dozen or more forms of it.

And we assume that a bottle of creatine that costs \$50 is better than the one that costs \$20.

Again, instead of looking at the price tag, look at the ingredients and dosages. Moreover, look at what studies have to say on the matter.

More often than not, the difference isn't significant, if any.

If an ingredient is listed on the label, that's all you need to know.

Supplement companies have to list the ingredients (and quantity) of each product they sell. But, due to limited funds in organizations like the FDA (in the USA), they don't check whether what's on the label is inside a product, too.

There are some independent nutrition product testing services such as ConsumerLab.com.

There, manufacturers can pay to have their products tested and confirm that the formula is what it's supposed to be.

I recommend to buy your products from established brands that have their own quality-assurance testing. And/or products with a certified seal such as the USP seal or certification from ConsumerLab.com – or another established brand.



Supplements are good replacements to whole foods.

I get asked this question often:

“What percentage of my calories should come from supplements?”

And my usual answer is about 10 to 20% of the total calorie intake for the day. It might seem low to some of you but I consider it to be the most anyone should take in a day. I'm not saying that supplements are bad or unneeded but I don't want you to rely on them too much to hit your calories and macronutrients.

Get 10 to 20% of your calories from supplements and leave the rest to whole foods. Otherwise, you'd be starving your body from the essential vitamins and minerals real foods deliver.

Protein powder makes you gain fat.

For some reason, there are people who believe that protein powder can cause fat gains. I'm here to tell you that this is not true, at all.

First off, protein is the most satiating macronutrient of all. I always bump my intake when I'm in a [fat loss](#) phase. It helps with hunger control.

Second, to gain fat, you need to be in a caloric surplus. Meaning, you need to be eating more calories than your body burns. Only then can your body have 'left over' energy to store as fat. The mere consumption of protein powder (or any other macronutrient, supplement, food or drink) in itself won't cause fat gain.

Creatine causes kidney issues.

I won't dig too deep in this one. Creatine is the most popular and researched supplement there is. It has been around since the early 70s and it's proven to work. It has also proven to be harmless to people with healthy and functioning kidneys.

You can read more about this popular myth getting debunked [here](#) and [here](#).

If a huge and shredded guy says he takes it, you should too.

Time and time again I come across all types of supplements from different companies with one thing in common:

A shiny label with a big, shredded dude making a mean face and flexing.

Look, I'm not against the dude. He's worked hard to attain his physique but attributing it to a single product makes me sick.

"Thanks to product XYZ, I now have a six pack for the summer!"

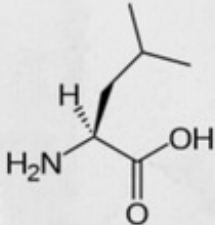
Well, maybe not that obvious and extreme. But watching reviews from famous fitness models, endorsing a product makes me feel like I'm at a car dealership.

I get that it's a marketing tactic and it increases sales but don't fall for the trap. Don't think that just because some jacked guy supposedly takes a product, it's actually good and will benefit you.

The person could be on steroids. They could be lying about taking it. And they've most likely been training for at least a decade to achieve that look.

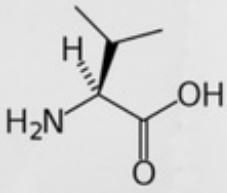
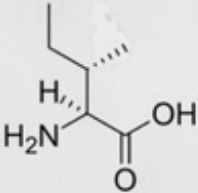
CHAPTER 2

BRANCHED-CHAIN AMINO ACIDS (BCAAs)



Branched-Chain Amino Acids (BCAAs):

Useful or Useless?



The image features a central text overlay on a background of crumpled paper. At the top, the chemical structure of Valine is shown. Below it, the text "Branched-Chain Amino Acids (BCAAs):" is written in red, followed by "Useful or Useless?" in large green letters. At the bottom, the chemical structures of Leucine (left) and Isoleucine (right) are displayed.

You've seen it. I have as well. The dude at the gym who always has that jug of green or purple liquid. Chances are, he's carrying a cocktail of BCAAs.

No real surprise there. BCAAs are one of the most popular supplements out there and many people swear by them. A friend of mine was so into them that he carried a large bottle of BCAAs with him on a date once.

Yeah, no girl is going to stay between him and his gains!

What are Branched-Chain Amino Acids and What do They do?

They are a group of 3 essential amino acids:

1. Leucine
2. Isoleucine
3. Valine

As far as their effects on the body, leucine seems to be the hard laborer of the trio. Leucine [stimulates muscle protein synthesis](#).

Second on the list is isoleucine. Its ability to stimulate muscle protein synthesis is much weaker than that of leucine. But, it's able to [increase glucose uptake](#) and the usage of glucose during training.

Finally, we have valine. The least impressive of the 3 amino acids, as far as we know. In isolation, valine doesn't seem to provide any real benefits over isoleucine or leucine.

Aside from BCAA supplements, these 3 amino acids are found in many high quality protein sources:

Meats, dairy, eggs, and whey protein.

Eating enough protein every day is likely going to ensure that you're getting enough of all 3 amino acids. So, given that, is there any extra benefit to taking BCAAs or are they a waste of money?

The claims most companies make about their BCAA supplements are pretty much the same:

- Improves recovery.
- Improves performance.
- Reduces exercise-induced muscle damage.
- Etc.

(Seriously, do they come up with these 'benefits' in board meetings?)

(And the 2016 award for most original benefits of a workout supplement goes to..)

You've heard it a 1000 times before. The same claims for every 'muscle-building' supplement under the sun.

What they don't tell you is that you can get your precious BCAAs from whole foods. Whoops. I guess you don't have to carry a jug of colored liquid everywhere you go like some kind of a weirdo.

Acute increases in BCAA levels (mainly leucine) [after lifting](#) help stimulate muscle protein synthesis. But, there is no real evidence that BCAA supplements are superior to real foods or [even whey protein powder](#) in that regard.

This is why pre and post-workout nutrition is very important for better results over time. Not the 'magical' BCAAs everyone seems to be praising.

Given all that, I hope you now understand that BCAAs are an overhyped and unnecessary supplement to take.

But, I can't move on without giving them some credit.

There is a benefit to taking BCAAs (more specifically leucine) under some circumstances.

It has to do with fasted training i.e. when your blood insulin levels are baseline. Usually, when training in the first half of the day, before eating your first meal.

See, [lifting in a fasted state causes faster breakdown of muscle protein](#) during and after the workout.

Unless you are able to get a balanced post-workout meal, taking BCAAs, before and during the session [can be](#)

beneficial. Without having to eat, you can still slow down the process of muscle protein breakdown until your first meal comes.

Furthermore, **getting a dose of BCAAs** before lifting can help slow down muscle protein breakdown during your lifting session.

If you follow an **intermittent fasting** protocol and train in the morning or you don't have time to eat before lifting in the morning, supplementing with BCAAs/leucine can benefit you.

But, if you train later in the day, after having a meal or two, and you can get a post-workout meal, I don't see any real benefits of taking BCAAs or isolated leucine to improve your gains over time.

CHAPTER 3

PROTEIN SUPPLEMENTS

When it comes to muscle growth, a lot of people imagine this picture:

A big guy just finishing his intense workout and having a big gulp of his protein shake.

There's no doubt that protein supplements are the most popular and sold product on the market. And there are so many variations coming out that I've lost track.

Protein chips. What?

Protein pudding. Really?

What's next? Protein cake?... Oh, never mind.

Anyways, the sheer amount of protein supplements out there can get confusing. And although some of these protein "everyday foods" do have some great nutritional values, I'd like to give my personal opinion on them:

I consider them to be unnecessary and expensive. Although there are certain protein bars that do taste damn good (Damn you, Quest Bars!), they're not worth the price tag per serving. And, if you want to make some tasty snacks that are high in protein, you can always use protein powder.

Protein powder is the best and most inexpensive product you could invest in. It comes in plain form so you have to do most of the work to make snacks but the average cost per serving is 60- 70 cents.

Now, for 22-25 grams of actual protein, that's a good deal.

But there is an insane amount of protein powders to choose from. And I'm going to dedicate the rest of this point, helping you choose yours.

First, let's take a look at what types of protein powders there are:

Whey Protein Powder

Whey protein is a substance isolated from whey (the liquid part of milk that separates during cheese production). Milk contains two main types of protein – casein and whey.

Whey used to be thrown away before it was discovered to be a complete protein, abundant in the amino acid we covered above – leucine.

Once the discovery was made, the whey protein supplement was born. Today, this supplement is the most sold one and the protein you get for every dollar spent is well worth it. It also tastes good and has a rich amino acid profile that is beneficial for muscle growth.

Casein Protein Powder

Much like whey, casein protein also comes from milk. It accounts for roughly 80 percent of milks' total protein content. The other 20 percent are left for whey.

You've likely hear that casein is a slow digesting protein and rightfully so. Casein has the unique ability to gel and is used as a binder and filler for some products.

Once you consume it, casein gels as it hits your stomach acid. This reduces the rate of digestion and allows for a steadier and more efficient use of the protein's amino acids.

Egg Protein Powder

As you've guessed, egg protein comes from... eggs. It's made by separating the yolk out and dehydrating the egg white.

Aside from being a great source of protein, this supplement also has the associated vitamins and minerals, found in egg whites. And because only the egg whites are used, there is no fat and only a small number of carbs in each serving.

Egg protein, like casein, is also a slow digesting one and offers the same benefits. The only downside of this protein is the cost. The average egg protein tub cost more than both casein and whey.

Also, some people are [allergic to eggs](#) which is something important to keep in mind.

And if the price of this supplement is a deal breaker, you can always eat a few eggs daily... like [Rocky did back in the day](#).

Soy Protein Powder

Unlike the above 2 types of protein, this one is more difficult to read. In recent years, there have been quite a few attacks made at that supplement and soy beans in particular.

The attacks are based on the arguments made that 1) soy beans have been genetically modified to produce greater crop generations and 2) soy's negative effects on hormone levels in men.

Let's take a few paragraphs to dissect the two claims.

First, according to government data for the United States, [roughly 91%](#) of soybeans grown there are genetically modified. According to [this source](#), the United States comes at #1 in soybean production with Brazil coming in second. Now, we can't be certain what percentage of soy protein powders are made from US beans. But, with them being in the lead of production, we can at least assume that the number is decent.

I won't get much deeper into the topic of modified foods but, as of right now in 2016, I prefer to steer clear from them when possible. If you're interested in learning more about GMOs, I recommend [this resource](#).

For the second argument:

The main issue arises from the soybean's [phytoestrogens](#) compound that mimics estrogen in the body. In guys, soy has been associated with a reduction in testosterone levels ([one](#), [two](#)) and [lower sperm count](#).

Whether these findings are completely true or not is up to debate. We can't draw concrete decisions from just one or two studies but given the data we currently have; my suggestion would be this:

A few servings of soy protein powder per week probably won't do you any harm. But, if you consume protein powder daily, mix soy protein with another kind such as casein or whey.

Hemp, Rice and Pea Protein Powder

Plant-based proteins have gained some bad rap from the broscience community. Deemed as an 'incomplete protein' that cannot serve the purpose of proper recovery and muscle growth.

These claims have no real base. And there are many studies that suggest that plant-based protein is just as good as any other.

For example, [this study](#) was conducted to determine the effects of animal protein versus plant. Over an 8-week period, the participants in the study took either rice protein isolate or whey protein isolate post-workout. The researchers wanted to determine whether the plant-based option would result in adequate recovery and body composition changes following an [isocaloric diet](#).

What they found in the two groups was that there were no significant differences.

Second, [this study](#) examined the effects pea protein had on participants who did resistance training vs. whey protein.

There were 161 guys, aged 18 to 35 years in the study. They underwent 12 weeks of resistance training for their arms. Participants were put in one of 3 groups: the pea protein, whey protein or placebo group.

Everyone had to take 25g of the proteins or placebo twice a day during the 12-week training period. Tests were performed on biceps muscles at inclusion, during and post training. Muscle thickness was evaluated using ultrasonography, and strength was measured on an isokinetic dynamometer.

The results showed an increase in arm thickness over the course of the study. The pea group had a significant advantage over the placebo group.

This study does show that supplementing with pea protein and lifting weights does lead to gains. But whether it is superior to other types of protein powders is up for debate. There are a ton of different factors that affect how someone responds to a given training protocol. Not just what supplements they are taking.

This study doesn't disclose whether the participants are new or advanced lifters and cannot tell the high responders from the low responders.

On to the third protein type – hemp. This supplement is made of hemp seeds and there are a ton of health benefits added to them, 3 of which are:

1. Omega 3 and Omega 6 fatty acid rich, with all of the [associated benefits](#).
2. Complete protein, containing all the 20 amino acids, including the 9 essential amino acids our bodies cannot produce.
3. Rich in vitamins such as Vitamin A, Vitamin B1, Vitamin B2, and more. Also minerals – Calcium, Iron, Magnesium, and a few more.

While the amount of protein per serving of hemp protein powder (one scoop or 30 grams) is only about 13.5 grams, it's still a great choice to supplement with for general health and well-being.

The only downside to this supplement is the price. It's a bit more expensive than the average.

What is the bottom line on protein supplements?

As far as protein bars, cakes, cookies, ice creams, puddings, chips, etc. go, I don't take any of them and don't particularly like them. I prefer to use my protein powder and just make those at home.

There are [lots of great recipes](#) out there.

As far as protein powders go, here's my recommendation:

If you're only going to use one type of protein, I recommend either casein or whey. Buy a smaller container and

see how it treats you. Milk products can upset a sensitive stomach and if one or the other doesn't suit you well, switch.

But, if you prefer to have many choices of protein powders with different tastes at the same time, I recommend mixing casein (especially during fat loss periods when hunger is an issue) or whey with an egg or plant-based powder such as rice, hemp, soy or pea.

CHAPTER 4

FAT-BURNER SUPPLEMENTS



Next to protein powders, fat burners are the most sold supplements out there. With the alarming rate of overweight and obese people, the alluring call of these 'magical' supplements sent from the heavens is tempting.

But are they worth their price tag? And do they deliver results? Let's find out.

First, allow me to answer what a fat-burner is NOT:

A fat burner is not a product that will help you burn fat even if your nutrition and training are crap. Nothing can out-do a bad diet.

Simply put, fat loss comes down to energy balance and how well you can [maintain your muscle](#).

Now, what makes most fat burners flawed and outright funny are the claims of their makers:

- Increasing fat oxidation rates;
- Inducing thermogenesis;
- Manipulating enzymes that control fat loss and fat gain;
- Improve nutrition partitioning;

These are all important aspects of effective fat loss. But, I'm going to go on a limb here and say that this is more

of an attempt to sell you on the idea of a fat burner. Whether that supplement can actually achieve these claims is either a scientific half-truth or downright uninvestigated with no real evidence to support.

A good fat burner is there to achieve 3 main things:

1. Increase Basal Metabolic Rate (BMR) to a degree.
2. Decrease hunger and cravings.
3. Increase feeling of fullness and well-being.

Most of the ingredients, found in the fat burners on the market, are ineffective in these regards. Let's take a look at a few of the most common ones:

Carnitine

Carnitine is synthesized in the body from the amino acids lysine and methionine. The molecule is involved in fatty acid metabolism. Carnitine can be found in many foods with red meats such as beef being the best options to add it to your diet. Fish and milk are also good sources.

In essence, carnitine transports the chains of fatty acids into the mitochondrial matrix. Thus, allowing the cells to break down fat and get energy from fat reserves.

Carnitine supplementation has also been [shown to increase endurance](#) in athletes who have taken a 3 or a 4-gram dose before running.

Furthermore, I found a dozen or so studies about carnitine's effect on fat loss and body composition. Sadly, all of them were either poorly executed or did not show any significant benefit of taking carnitine to speed up fat loss.

From what I've researched, I've come to the conclusion that carnitine doesn't seem to have a significant impact on fat loss. But, it can be useful to boost energy levels and help push through difficult workouts.

That could lead to more muscle damage, more calories burned, more training volume, and better workouts.

But, since carnitine acts as a stimulant rather than a thermogenic, taking it for fat loss isn't ideal.

Caffeine

Caffeine is a well-known substance and I'm guessing many of you drink coffee daily. Caffeine can help speed up fat loss by [increasing your body's daily energy expenditure](#). And since weight loss comes down to being in a caloric deficit, caffeine can help make sure you're in one.

Caffeine has also proven itself worthy by [increasing alertness and energy levels](#), [decrease appetite](#), improve memory and delivering antioxidants to our body.

From what we know about caffeine, it seems like a well-rounded, effective substance to take, especially if you're trying to lose fat. But, keep in mind that the body can get used to caffeine over time and build a tolerance.

That is why I recommend laying off it for a week or two every few months. Furthermore, caffeine can also be harmful if you exceed the [recommended daily limit](#).

Caffeine is a great fat-burning substance and can be effective when the dosage is right.

Garcinia Cambogia

Garcinia Cambogia is a bright-green tropical fruit that look like a small pumpkin. The fruit has been used to flavor Asian and Indian curries.

But what makes the fruit interesting aren't its citrus-like properties but one of the ingredients it has – hydroxycitric acid (HCA).

HCA has been praised to be a fat-burning agent that raises the levels of the brain chemical serotonin (which makes you feel less hungry). And also blocks an enzyme called citrate lyase, which your body uses to make fat.

But, despite these claims and the hype, Garcinia Cambogia has failed to deliver.

A [meta-analysis](#) of 12 randomized, double blinded clinical trials on garcinia cambogia found that the differences between the groups that took either HCA or placebo were small and insignificant for weight and fat loss.

Furthermore, [this study](#) which involved 135 participants came out with the same verdict:

Over a 12-week period, both groups lost a good amount of weight; but there were no significant differences between them.

From what we can draw from the literature, it seems that Garcinia Cambogia is not the fat-burning agent's it's hyped up to be. And it would not be effective when put in a fat-burner.

Synephrine

Synephrine is an alkaloid, occurring in some plants, most commonly extracted from Bitter Orange. In fat-burners, synephrine is presented as Citrus aurantium (bitter orange) which includes synephrine alkaloids.

When it comes to fat loss, the literature is not that promising. First off, we've got [this review](#) looking at 20 studies with 360 total participants. They took either p-synephrine (protoalkaloid) alone or in a combination with other ingredients. The products were taken for up to 12 weeks with 44% of participants taking only p-synephrine.

In conclusion, they found that:

In general, bitter orange extract alone (p-synephrine) or in combination with other herbal ingredients did not produce significant adverse events as an increase in heart rate or blood pressure, or alter electrocardiographic data, serum chemistry, blood cell counts or urinalysis.

And:

p-Synephrine alone as well as in combination products were shown to increase resting metabolic rate and energy expenditure, and modest increases in weight loss were observed with bitter orange extract/p-synephrine-containing products when given for six to 12 weeks. Longer term studies are needed to further assess the efficacy of these products and affirm their safety under these conditions.

The modest increases don't sound that promising and I'm more on the err side for now.

[This study](#) had participants take either p-synephrine or in conjunction with other ingredients to determine its effect on RMR. What they found was rather discouraging:

The group receiving p-synephrine (50 mg) alone exhibited a 65 kcal increase in RMR as compared to the placebo group.

There is an increase in RMR but it's so insignificant that I doubt it could result in more fat loss over time.

Furthermore, bitter orange is said to have some possible bad side effects, especially when taken with caffeine. Here is a direct quote from WebMD:

But bitter orange is POSSIBLY UNSAFE when taken as a supplement for a medical purpose such as weight loss. Bitter orange, particularly when taken with stimulants such as caffeine or caffeine-containing herbs, increases the risk for high blood pressure, fainting, heart attack, stroke, and other severe side effects.

There are reports that bitter orange can trigger headaches, including migraine and cluster headaches, in some people.

Here is the [full material](#).

From what we can draw from the research, it seems that aside from the small boost in RMR, synephrine is not the fat-burning compound some claim it is. I consider it an ineffective supplement to take alone or within a fat-burner.

Forskolin

Forskolin is found in the herb *Coleus forskohlii*. In the fitness industry, Forskolin has been used as an ingredient in fat-burning supplements.

The [most prominent study](#) made on Forskolin examined its effect on testosterone levels, fat loss, metabolic rate and blood pressure in overweight and obese men. They had the participants take 250 mg of a 10% forskolin-containing coleus twice a day, or a total of 50 mg of Forskolin per day.

Their findings were promising:

1. *Forskolin was shown to elicit favorable changes in body composition by significantly decreasing body fat percentage and fat mass as determined by DXA compared with the placebo group;*
2. Additionally, forskolin administration resulted in a change in bone mass for the 12-week trial compared with the placebo group;
3. There was a trend toward a significant increase for lean body mass in the forskolin group compared with the placebo group;
4. Serum free testosterone levels were significantly increased in the forskolin group compared with the placebo group;

From what we can draw from this study is that forskolin is an effective supplement for fat loss on its own or in a fat-burner, provided the dosage is right.

Yohimbine

Yohimbine is a substance found in the *Pausinystalia yohimbe* plant [that has been shown](#) to help speed up fat loss.

The subjects in the study were assigned to one of two groups:

One took tablets that contained 20 mg of Yohimbine, twice per day. The other took identical-looking tablets, containing cellulose.

Yohimbine didn't show benefits for muscle mass and performance. But it did show a reduction in body fat percentage compared to the placebo group.

Yet, despite these findings, you need to take Yohimbine [while fasted](#) for it to have an effect. This makes me lose interest in it because it doesn't fit my situation.

It seems that Yohimbine can be beneficial for fat loss, as long as you take it in a fasted state and train afterwards.

Green Tea Extract

The green tea extract is a substance found in green tea leaves and has been shown to deliver [many benefits](#), one of which is aid in fat loss.

It has been shown to [increase fat oxidation rates by as much as 17%](#) in healthy young guys.

It has also been shown to [induce thermogenesis and increase metabolic rate](#).

Green tea also contains caffeine which we already covered and found to be a good fat-loss helper.

Considering green tea's many health benefits, the fact that it is calorie free, and the fat-loss benefits it provides, I'm putting it in the effective category. I consider it to be a great product to take on its own or in a fat-burning supplement.

Green Coffee Extract

Green coffee extract comes from unroasted coffee beans. They are naturally green but the roasting makes them change color to brown or black. The main substance, found in coffee beans that is supposed to aid in fat loss is Chlorogenic Acid.

After the coffee bean is roasted, most of the acid is lost so it can only be derived from green coffee beans.

But is the Chlorogenic Acid the fat loss aid it's claimed to be? A [meta-analysis](#) reviewed 3 randomized clinical trials that met their criteria. There were a total of 142 participants across the 3 studies.

Their conclusion:

The evidence from RCTs seems to indicate that the intake of GCE can promote weight loss. However, several caveats exist. The size of the effect is small, and the clinical relevance of this effect is uncertain. More rigorous trials with longer duration are needed to assess the efficacy and safety of GCE as a weight loss supplement.

Until more research is done, this substance's value for fat loss is uncertain. Thus, I don't believe it is an effective supplement to take on its own or within a fat-burner.

So what's the bottom line on fat-burners?

We examined 8 popular ingredients found in most of the popular fat-burners out there and we ended up with this:

Ineffective vs. Effective	
✗ Carnitine	Caffeine ✓
✗ Garcinia Cambogia	Forskolin ✓
✗ Synephrine	Yohimbine ✓
✗ Green Coffee Extract	Green Tea Extract ✓

Four of all 8 substances don't seem to deliver much if any benefits for fat loss. One can be effective if used in a fasted state (Yohimbine). And 3 are actually effective to take on their own or as a part of a fat-burner.

As you can see, most fat burners don't live up to the hype and are a waste of money. The shiny label can be alluring but it's important to understand how each ingredient can help you, and make an informed decision.

My Supplement Recommendations for Fat Loss

To lose fat, you need to be in a caloric deficit. That is a given. But, certain supplements can help enhance the whole process and even make dieting a less tedious process. Here are my recommendations:

1.Green Tea Extract

A dose of [at least 270 mg a day](#) should be enough to provide the health benefits. But, if you look at the dosages [proven to be effective in studies](#), you'll notice that 400-600 mg per day is optimal.

I advise against taking green tea extract pills on an empty stomach. They are known to cause nausea.

Also, keep in mind that certain Green tea extracts contain small amounts of caffeine. Check the label out and if yours has any, take it earlier in the day.

Other than that, you are free to take the pills whenever it's convenient for you.

2.Yohimbine (under the right circumstances)

Yohimbine only works if you're training fasted, that much we covered.

As far as dosing goes, [research](#) has shown that 0.2 mg per kg of bodyweight is enough to provide the fat loss benefits. This is especially true when taken [before a workout](#) in a fasted state.

I recommend starting with 0.1 mg per kg to see how your body responds. Some people have reported feeling jittery from yohimbine.

Yohimbine has also been [shown to raise blood pressure](#). If you already have high blood pressure, I don't recommend taking it.

3.Forskolin

In [this study](#), the participants took 250 mg forskolin (10% forskolin extract, twice a day) or a total of 50 mg per day. Those dosages were proven to be effective for the participants in the study.

And, from what we can gauge from this study, the timing didn't matter.

4.Caffeine

Because of your body's natural tendency to build up tolerance towards stimulants, I advise you to cycle caffeine. You can do that in two ways:

- Cycle caffeine intake on a 4 week on, 1 week off ratio.
- Have a low-caffeine day and a no-caffeine day each week.

That way, you can ensure that your body doesn't build too much of a tolerance.

As far as dosing goes, keep your intake to about 5-6 mg per kg of body weight. Just for reference, a standard 8-ounce cup of brewed coffee contains [95-200 mg of caffeine](#).

I'd like to end this point with a story from Omar Isuf on his (unfortunate) experiences with fat-burners:

CHAPTER 5 PRE-WORKOUT ENERGY SUPPLEMENTS

Pre-workout supplements have gained a lot of popularity in the recent years. But, a lot can be said about these stimulants and whether they help your performance in the gym.

I consider most pre-workouts out there to be garbage. Each serving doesn't contain enough of the key ingredients required to improve performance.

A good pre-workout supplement has enough of the right ingredients in each serving. But, since that raises production cost quite a bit, companies can't maximize profit that way. So, they just 'include' the appropriate products. But the doses are small and ineffective to save money on production and bring in bigger profits.

Most pre-workouts are stuffed full with ingredients:

1. you don't want (say caffeine, for example);
2. you don't need (that don't benefit you);
3. that are dosed inappropriately and don't benefit you the way they should.

Here are the essential ingredients. In the appropriate dosages, they can improve your energy, performance and focus:

Citrulline Malate

This is the most effective supplement you could take to acutely improve your performance in the gym. And not have to suffer the energy crash that usually comes if you were to take caffeine.

There have been many studies made on the efficacy of this product ([this](#), [this](#) and [this](#)). All of them suggest that a dose of CM consumed before a workout does increase performance and aerobic activity.

You might be wondering whether this supplement is safe to take. As far as research goes, citrulline malate seems to be safe. As long as it the dose is within the daily recommended limit (no more than 10 grams). In some cases, it has been shown to cause stomach distress, but only when taken on an empty stomach.

The only people who should avoid this supplements are those who have [Citrullinemia](#).

As far as dosages go, you need to take between 6 and 8 grams to feel the effect. 15-30 minutes before training should be okay.

Carnitine

We already covered carnitine in the fat-burning section and came to the conclusion that it doesn't do much for fat loss alone. It does, however, help [improve performance](#) and that is why it can be an effective pre-workout supplement.

A dose of 2-4 grams before training can increase performance.

Caffeine

Not only is caffeine a substance that could speed up fat loss but it is also a good stimulant to take pre-workout. We learned that it also helps improve [alertness and performance](#).

I do have a couple of caveats about caffeine:

1)Your body builds up tolerance towards caffeine over time and makes it less effective. That is why cycling off it every 4-6 weeks for a week or two is important.

2)Taking a dose of caffeine later in the day [can make falling and staying asleep hard](#). This is why I don't recommend taking it pre-workout if you train in late afternoon or the evening. Cut the intake within 8 hours of your bed time to avoid sleeplessness.

Beta-Alanine

Beta-alanine is the last supplement that can be included in a pre-workout shake. But, it's efficacy is dependent

on your training style.

Let me explain:

This [meta-analysis](#) examined 15 studies with 360 total participants. 174 of them were in the beta-alanine group and 186 were taking a placebo.

There were 3 different durations for the exercises measured across the studies:

0-60 seconds; 60-240 seconds and 240 seconds +.

For the 0-60 second testing (that applies to us lifters), the findings were disappointing:

For the 14 measures lasting <60 s there was no significant difference between the effect sizes in the BA and Pla groups;

For the 60-240 seconds testing:

For the 9 measures lasting 60–240 s there was a significant difference between the effect size of the BA and Pla groups

Meaning that beta-alanine is likely going to impact your performance in the gym if your sets extend past 60 seconds. Which, let's be honest, rarely if ever happens.

And finally, after 240 seconds:

However, once exercise duration increased over 240 s the beneficial effects of β -alanine supplementation from the 34 measures become less pronounced, although still significant;

If your training involves activities that last well past 60 seconds, taking beta-alanine can be helpful to you. But, if you're an average lifter/bodybuilder/powerlifter, it's likely not going to help you and you don't need to take it.

If you do want to take it, a dose of 3 grams before training should be enough.

The Bottom Line on Pre-workouts and What I Recommend

Out of the 4 ingredients we looked through, I consider only 2 to be effective and worth the money – Citrulline Malate and Carnitine. The other two Beta-Alanine and Caffeine are circumstantial.

Caffeine shouldn't be taken in the second half of the day because it can screw up your sleep.

Beta-Alanine won't be effective unless your sets exceed past 60 seconds in duration.

Since most pre-workouts include ingredients you don't need or can actually hurt your sleep, I don't consider them a viable option.

If you've found a pre-workout that works for you, doesn't hurt your sleep and fits within your budget, more power to you.

But, for the rest of us I've got another alternative:

Make your own pre-workout drink.

Combine 2 to 4 of the ingredients from above, depending on which ones you find suitable, add a flavoring agent to mask the bad taste of the raw ingredients and take before each workout. I recommend something sour like lemon to mask the bitter taste of citrulline malate.

Not only will you know exactly what you'd be taking but you would spend much less money and get only what YOU want.

CHAPTER 6

VITAMINS, MINERALS & MULTIVITAMIN SUPPLEMENTS



I'm sure you've heard of multivitamins and for a good reason:

They are widely marketed and highly sold supplements.

Multivitamins are the holy grail of health.. in theory. Your body needs a wide variety of vitamins and minerals that you would normally get from a well-balanced, healthy diet.

But since the quality of the average person's diet has dropped drastically, we are also deficient in some of the vital vitamins and minerals our body need to perform its tasks and keep us healthy and vibrant.

Enter multivitamins. They are here to fix that problem (in theory, as I mentioned). The problem is, as with most supplement today, multivitamins are highly overhyped. Companies make false claims, promise results they can't deliver and most people fall for the scam.

But we are here to put a stop to that (or at least try).

The Essential Vitamins and Minerals Your Body Needs Daily

To judge a multivitamin supplement as effective or ineffective, we first need to know:

1. What the essential vitamins and minerals are;
2. How they affect our body;
3. Whether the product can actually deliver them.

Let's go through some of the terms we'll be tossing around below:

RDA: Recommended dietary allowance. This represents the daily average dietary intake a person need to stay healthy and steer away from deficiencies.

AI: For vitamins for which there hasn't been yet set a RDA (usually due to lack of scientific data), adequate intake

(AI) is used, instead.

UL: The tolerable upper intake level is the largest amount of a given vitamin or mineral a person can take in a day that is likely to be safe. More is not always better so stay under the UL to keep toxicity at bay.

Before we proceed, let's take a look at how vitamins and minerals are measured.

Larger doses are measured in milligrams (mg). A milligram is 1/1,000 of a gram (g), which is 1/1,000 of a kilogram (kg), which itself is roughly 2.2 pounds (for you Americans).

Smaller doses are measured in micrograms (mcg). A microgram is 1/1,000 of a milligram.

Certain vitamins, such as vitamin D, are measured in IU (international units). This is a measurement which varies based on the substance and its potency.

Now let's take a look at the essential vitamins and minerals and their RDA or AI that apply to adults who are 18 or older.

The long, green box is going to be dedicated to the brief overview of these substances, what they do, what the RDAs/AIs/ULs are, and natural food sources.

The 13 Essential Vitamins

Retinol (Vitamin A)

Vitamin A is good for the vision but it has many other vital tasks: it encourages red and white blood cell production, maintains proper immune function, regulates cell growth and division. It also helps with the normal function of the heart, lungs, kidneys, and other organs.

RDA/AI:

Men: 900 mcg per day

Women: 700 mcg per day

Food Sources:

Kale (443 mcg per ½ cup), carrots (538 mcg per ½ cup), sweet potatoes (961 mcg per ½ cup), canned pumpkin (953 mcg per ½ cup), butternut squash (572 mcg per ½ cup), cantaloupe(467 mcg per ½ melon).

UL: 3,000 mcg per day.

Biotin (Vitamin B7 or Vitamin H)

Much like the rest B-complex vitamins, biotin plays an important role in cell growth, production of fatty acids, metabolism of fat and helps maintain a steady blood sugar level. Deficiencies of this vitamin are quite rare.

RDA/AI: 30 mcg per day

Food Sources:

Eggs or egg whites(13-25 mcg per large egg), Cooked salmon (4-5 mcg per 3 ounces), Almonds, peanuts, pecans and walnuts. Most fresh vegetables.

UL: Not determined

Folic Acid (Folate)

Folate is responsible for the creation of healthy new cells in the body and plays a huge role during pregnancy. It ensures the baby's proper development and helps prevent major birth defects.

RDA/AI: 400 mcg per day

Food Sources:

Lentils (350 mcg per cup), Spinach (250 mcg per cup), White rice (180 mcg per cup), Broccoli (100 mcg per cup), Asparagus (20 mcg per spear)

UL: 1,000 mcg per day

Vitamin K

Vitamin K is essential for bone development, wound healing and your body's ability to create blood scabs (to prevent bleeding out).

RDA/AI:

Men: 120 mcg per day (AI)

Women: 90 mcg per day (AI)

Food Sources:

Green Leafy Vegetables (550 mcg per cup), Broccoli (220 mcg per cup), Parsley (250 mcg per ¼ cup), Cabbage (82 mcg pr ½ cup)

UL: Not determined.

Vitamin D

Vitamin D is important for quite a few things such as immunity, calcium metabolism, bone density, nervous system and preventing the development of osteoporosis later in life. But, soaking up sunlight isn't the only way to get enough of it.

RDA/AI: [A review](#) made by the US Institute of Medicine reports that an adequate intake of Vitamin D is 600-1000IU(15-25 mcg) per day for children aged 1 to 18 and 1500-2000IU(37.5-50 mcg) for adults aged 19+.

Food Sources:

Fatty fish (tuna, salmon and mackerel), Vitamin D-fortified foods (some dairy products, soy milk, orange juice and cereals), Cheese, Egg yolks and Beef Liver.

Aside from that, 20 to 25 minutes of sun exposure without sunscreen can also be beneficial.

UL: 25-50 mcg per day, depending on your age.

Vitamin C

Vitamin C has been shown to lower the risk of some cancers, help make collagen (an important tool for wound repair), boost immunity and serve as an antioxidant for the body.

RDA/AI:

Men: 90 mg per day

Women: 75 mg per day

Food Sources:

Strawberries (85 mg per cup), Red peppers (95 mg per ½ cup), Broccoli (51 mg per ½ cup), Grapefruits (76 mg per medium fruit), Tomatoes (16 mg per medium tomato).

UL: 2,000 mg per day.

Vitamin E

Vitamin E is most commonly known for its antioxidant functions but that's not all. It also helps with enzymatic activities and neurological functions.

RDA/AI: 15 mg per day

Food Sources:

Almonds (7.4 mg per ounce), Hazelnuts (4.3 mg per ounce), Olive Oil (1.9 mg per tablespoon), Canola Oil (2.4 mg per tablespoon), Avocado (3 mg per medium avocado).

UL: 1,000 mg per day.

Vitamin B6

Vitamin B6 is involved in as much as 100 biological processes including metabolism of food, production of hormones (such as serotonin), creation of red blood cells, helps maintain good immune function and overall well-being of all living organisms.

RDA/AI: 1.3 mg per day

Food Sources:

Salmon (0.48 mg per 3 ounces), Chicken (0.51 mg per 3 ounces), Bananas (0.43 mg per medium banana), Hazelnuts (0.18 mg per ounce), Cooked spinach (0.44 mg per cup).

UL: 100 mg per day.

Vitamin B12

Vitamin B12 is involved in the metabolism of food, creation of cells and nervous system function.

RDA/AI: 2.4 mcg per day

Food Sources:

Clams (84 mcg per 3 ounces), Mussels (20.4 mcg per 3 ounces), Beef (2.1 mcg per 3 ounces), Salmon (2.4 mcg per 3 ounces), Eggs (0.6 mcg per large egg), Skim milk (0.9 mcg per ounce)

UL: Not determined.

Pantothenic Acid (Vitamin B5)

Vitamin B5 plays a critical role in the metabolism of fats, carbs and proteins, development of the nervous system, creation of certain hormones, red blood cells and more.

RDA/AI: 5 mg per day

Food Sources:

Chicken (0.98 mg per 3 ounces), Eggs (0.61 mg per large one), Sweet potato (0.88 mg per medium one), Avocado (1.99 mg per large one), Yogurt (1.35 mg per cup), Mushrooms (0.52 mg per ½ cup).

UL: Not determined.

Niacin (Vitamin B3)

Vitamin B3 is important for the metabolism of energy in cells, DNA repair, production of sex and stress hormones by the adrenal gland, removal of toxins from the body and helps maintain healthy skin, hair and eyes.

RDA/AI:

Men: 16 mg per day
Women: 14 mg per day

Food Sources:

Peanuts (3.8 mg per ounce), Chicken (7.3 mg per 3 ounces), Salmon (8.5 mg per 3 ounces), Fortified cereals (20-27 mg per cup), Coffee (0.5 mg per cup).

UL: 35 mg per day.

Riboflavin (Vitamin B2)

Vitamin B2 plays an important role in the metabolism of foods, helps with cellular processes, enhances the health of your hair, skin, muscles, eyes and brain. [Some research](#) also suggests that Vitamin B2 may be effective at dealing with migraines.

RDA/AI:

Men: 1.3 mg per day
Women: 1.1 mg per day

Food Sources:

Milk(0.34 mg per cup), Almonds (0.23 mg per ounce), eggs(0.27 mg per large one), enriched grains and cereals (0.59-2.27 mg per cup).

UL: Not determined.

Thiamin (Vitamin B1)

Vitamin B1 helps with food metabolism, enhances health, skin, muscle and brain health.

RDA/AI:

Men: 1.2 mg per day
Women: 1.1 mg per day

Food Sources:

Enriched long grain white rice (0.26 mg per cup), pecans (0.19 mg per ounce), lentils (0.17 mg per ½ cup), cantaloupe (0.11 mg per ½ fruit), milk (0.10 mg per cup).

UL: Not determined.

The 14 Essential Minerals

Before we dive into the minerals, I'd like to clarify 2 things first:

1. Minerals are inorganic substances and contain no carbon. All of them can be found on the periodic table.
2. Minerals fall in one of two categories: macrominerals (which your body needs in large dosages) and trace minerals (which your body needs only a pinch of).

Iodine

This essential trace mineral is needed to create thyroid hormones, which control our metabolic rate, body temperature and muscle function.

RDA/AI: 150 mcg per day.

Food Sources:

Cod fish (100 mcg per 3 ounces), baked potatoes (60 mcg per medium one), milk (56 mcg per cup), shrimp (35 mcg per 3 ounces), canned tuna (about 35 mcg per can).

UL: 1,100 mcg per day.

Fluoride

Fluoride is a non-essential trace mineral that helps maintain your teeth healthy and cavity-free and your bones stronger.

RDA/AI:

Men: 4 mg per day

Women: 3 mg per day

Food Sources:

Tap water in many countries is already fluorinated. Aside from that: Canned sardines (0.2-0.4 mg per 3.5 ounces), chicken (0.06-0.10 mg per 3.5 ounces)

UL: 10 mg per day.

Copper

Copper is an essential trace mineral and antioxidant. It plays an important role in the creation of red blood cells, proper energy metabolism, immunity and nervous system function.

RDA/AI: 900 mcg per day

Food Sources:

Cashew (630 mcg per ounce), Oysters (670 mcg per medium one), mushrooms (350 mcg per cup), crabmeat (200 mcg per ounce).

UL: 10,000 mcg per day.

Calcium

Calcium is a macromineral crucial for the proper development of bones and teeth. Calcium also helps with proper muscle function, nerve signaling, blood pressure, and blood clotting. And, just like vitamin D, calcium also helps ward off against osteoporosis later in life.

RDA/AI: 1,000 mg per day

Food Sources:

Milk (300 mg per cup), yogurt (300 mg per cup), cheddar cheese (303 mg per 1.5 ounces), tofu (258 mg per ½ cup), spinach (115 mg per ½ cup), rhubarb (174 mg per ½ cup).

UL: 2,500 mg per day.

Magnesium

Magnesium is a macromineral that, along with calcium, is involved in hundreds of biological processes. Some of them include: muscle contraction, blood clotting, cell signaling, energy metabolism, blood pressure regulation, and building healthy bones and teeth.

RDA/AI:

Men: 400 mg per day.

Women: 310 mg per day.

Food Sources:

Almonds (78 mg per ounce), cooked spinach (78 mg per ½ cup), brown rice (86 mg per cup), bananas (32 mg per medium one).

UL: Not determined.

Iron

Iron is an essential mineral involved in many important processes. Most notably: in the making of red blood cells, production of amino acids, collagen, neurotransmitters, and hormones.

RDA/AI:

Men: 8 mg per day.

Women: 18 mg per day.

Food Sources:

Cooked beef (2.3 mg per 3 ounces), Oysters (5 mg per 6 medium ones), cooked lentils (3.3 mg per ½ cup), prune juice (2.28 mg per 6 fluid ounces), cashew (1.89 mg per ounce), potatoes (1.87 mg per medium one).

UL: 45 mg per day.

Manganese

Manganese is an essential trace mineral and antioxidant, but it can also be toxic in excess doses. It's important for energy metabolism, proper bone development, and wound healing.

RDA/AI:

Men: 2.3 mg per day.

Women: 1.8 mg per day.

Food Sources:

Brown rice (2 mg per cup), oatmeal (1.5 mg per cup), pineapples (1.5 mg per cup), pecans (1.3 mg per ounce), green tea (0.4-1.6 mg per cup).

UL: 11 mg per day.

Potassium

Potassium is an a macromineral and electrolyte that is essential for the body's steady heart beat, nervous system signaling, and proper muscle function.

RDA/AI: 4,700 mg per day.

Food Sources:

Baked potato (930 mg per medium one), plums (640 mg per ½ cup), raisins (600 mg per ½ cup), bananas (400 mg per medium one), artichokes (340 mg per medium one).

UL: Not determined.

Sodium Chloride

Sodium is a macromineral essential for maintaining cellular fluid balance, nerve signaling, muscle contraction, food digestion, and blood pressure regulation.

RDA/AI: 1,500 mg per day

Food Sources:

The best way to get enough sodium is to lightly salt your meals. Only 2/3 of a teaspoon contains enough to meet your needs.

UL: 2,300 mg per day.

A quick note:

To avoid going over that number (which can happen easily), steer clear from pre-cooked canned foods, fast foods, most condiments, some sauces, salad dressings, potato chips, salted nuts and deli meats.

Phosphorus

Phosphorus is a macromineral vital for the health and well-being of your teeth and bones. It also plays an important role in converting food to energy and shuttling nutrients through your body. Phosphorus is also a component of the DNA and RNA.

RDA/AI: 700 mg per day.

Food Sources:

Milk (257 mg per cup), yogurt (385 mg per cup), cheese (131 mg per ounce), salmon (252 mg per 3 ounces), chicken (155 mg per 3 ounces), eggs (104 mg per large one), oh and beer – (173 mg per 3 ounces).

UL: 4,000 mg per day.

Chromium

Chromium is a trace mineral that is known to slightly enhance insulin's effects on our bodies and is involved in the metabolism of food.

RDA/AI:

Men: 35 mcg per day.

Women: 25 mcg per day.

Food Sources:

Broccoli (22 mcg per cup), potatoes (3 mcg per cup), garlic (3 mcg per teaspoon), grape juice (7.5 mcg per cup).

UL: Not determined.

Molybdenum

This is a trace mineral involved in different bodily processes including energy production within cells, nervous system development, and processing of waste in the kidneys. Molybdenum deficiencies have never been documented in healthy people and toxicity is very rare.

RDA/AI: 45 mcg per day.

Food Sources:

Split peas (148 mcg per cup), black beans (130 mcg per cup), nuts such as peanuts and almonds (about 42 mcg per cup).

UL: 2,000 mcg per day.

Selenium

Selenium is well-known for its antioxidant properties that protect cells from being damaged. It also plays an

important role in the regulation of thyroid hormones and metabolism.

RDA/AI: 55 mcg per day.

Food Sources:

Crabmeat (41 mcg per 3 ounces), salmon (40 mcg per 3 ounces), enriched noodles (38 mcg per cup), pork (35 mcg per 3 ounces), beef (16 mcg per 3 ounces).

UL: 400 mcg per day.

Zinc

Zinc is a trace mineral that serves as a building block for enzymes, proteins, and cells. It also releases Vitamin A from the liver, boosts immune system function, and wound healing.

RDA/AI:

Men: 11 mg per day.

Women: 8 mg per day.

Food Sources:

Oysters (13 mg per oyster), beef (6 mg per 3 ounces), milk (2 mg per cup), turkey (4.5 mg per 3 ounces), cashew (4.5 mg per 3 ounces).

UL: 40 mg per day.

What's The Bottom Line on Multivitamins?

As you can see, getting the essential vitamins and minerals from your diet on a daily basis can be a difficult task. Thus, a multivitamin seems like a no-brainer. A pill or two a day and your deficiencies are no more!

But, if you take a look at the label of most multivitamins, you'll notice 2 major flaws:

1. Most of them don't have all the essential vitamins and minerals your body needs.

They are not dosed well and contain micronutrients we aren't likely to be deficient in. Or worse – certain ingredients are super-dosed, making them harmful to your health.

2. Many multivitamins contain a long list of ingredients that you've never heard of nor do you need.

Most of these ingredients don't have any research behind them and are likely unproven and ineffective.

The long list of ingredients could make some people think they're getting a lot for their money. But, the truth is, most of the stuff is just a low-cost filler that helps reduce production costs and maximize profit.

With that out of the way, there are some multivitamins out there that are actually good and worth the money.

Given the recommended doses of each vitamin and mineral your body needs, you can look at the label, see what it contains, what the dosages are, and make an informed decision.

You will most likely have to look up a dozen or more products before you find a good one but they are out there.

I recommend [this resource](#) for some good recommendations.

CHAPTER 7

TESTOSTERONE & TESTOSTERONE-BOOSTING SUPPLEMENTS

Testosterone boosters have gained quite the popularity in recent years. Some sites even post articles with titles

like “Best Testosterone Boosters of 2016”... Really? Like they even exist.

Supposedly, a testosterone booster gives you benefits such as:

- Build more muscle and lose more fat with less effort.
- Dramatically increase your energy levels.
- Have the sex drive of a 20-year old.
- Sleep like a baby.

All good, right? I mean... who, in their right mind, wouldn't want these benefits for just \$50-70 per month?

Thus, testosterone boosters seem like a no-brainer. Just pop a pill or two a day and voila – you're going to make all kinds of gains in the gym and in life.

Except...

That's not true at all. Let's dig deep and find out why.

What is Testosterone's Role in The Body and Why It Is Important

Testosterone is a male sex hormone that influences important things like:

- Muscle strength and rate of growth.
- Sperm production and its quality.
- Sex drive.
- Well-being and energy levels.
- Production of red blood cells.

It is safe to say that testosterone is important... quite a lot, actually.

Lower than normal testosterone levels can have negative effects such as:

- Low sex drive & erectile dysfunction.
- Low sperm count.
- Decline in athletic performance and muscle loss.
- Trouble sleeping.
- Increase in body fat.
- Mood swings and depression.
- Loss of mental focus and drive.

Basically, nasty stuff. We don't want that.

What are Normal Testosterone Levels?

Before we can talk about testosterone levels, I'd first like to clarify the difference between testosterone and free testosterone.

Most of the testosterone our body produces binds to two proteins – albumin and sex hormone-binding globulin (SHBG). Most of the testosterone, bound to SHBG, is not considered bioavailable and is not available for use.

The smaller portion of testosterone, bound to albumin, is considered bioavailable because it dissociates freely and becomes available for tissue intake.

And then, there is the free testosterone. The small portion that circulates freely and is not bound to either of the two proteins.

Both total and free testosterone levels can be assessed with a simple blood test. They are most commonly expressed in nanograms per deciliter (of blood). A nanogram (ng) is small – like a billionth of a gram small. A deciliter (dL) is 10 liters.

The normal ranges of total testosterone are:

Men

15-16 years old: 100-1200 ng/dL.

17-18 years old: 300-1200 ng/dL.

19+: 240-950 ng/dL.

Women

17-18 years old: 20-75 ng/dL.

19+: 8-60 ng/dL.

As you can see, the normal range for testosterone varies. Some people have a naturally higher level and others a lower.

What are Considered Low Testosterone Levels?

The ranges of 'normal' testosterone levels vary. The upper limit is 12x the lower limit in 15-16 years old, 4x for 17-18 years old guys and 4x for everyone aged 19+.

Because of that, you might be thinking:

“Well, even if my testosterone is within these ranges, shouldn't I try to keep it to the upper border?”

You should, and I'll explain why in the next point.

But, there is something I do want to clarify about testosterone now:

Everyone is different and what could be considered normal for one person could be low for another.

For example, a 40+ year old man might feel great at 400 ng/dL. At the same time, a twenty-something year old could show symptoms of low testosterone.

[This study](#) investigated hypogonadal symptoms (low testosterone) in relation to serum total testosterone in men younger than 40 years. What they found was that men with testosterone levels less than 400 ng/dL showed hypogonadal symptoms such as sadness, decreased energy, decreased athletic performance, and deterioration in work performance.

The bottom line is this:

Even though your testosterone levels might be in the 'normal' range, you could still be experiencing symptoms of low testosterone and need to keep them in mind if you decide to do a blood test.

How Testosterone Impacts Muscle Growth and Athletic Performance

Testosterone is well-known as an essential part of muscle growth, and rightfully so. Testosterone is a [key player for muscle growth](#).

In fact, it is such a powerful anabolic hormone that men who were injected with 600 mg weekly for 10 weeks

managed to gain muscle size without even training, [this study](#) showed.

The bottom line on testosterone injection is this:

Supraphysiologic doses of testosterone, especially when combined with strength training, increase fat-free mass and muscle size and strength in normal men.

But what about us natural lifters? How does testosterone correlate with muscle growth? We already know that injecting testosterone and raising the levels above the normal range results in rapid muscle growth.

What about within the normal ranges, with or without the use of steroids?

If we look at [this study](#), we can see that, although testosterone was increased through injecting, within the physiological range, it's still marginally anabolic.

Here is a direct quote:

The administration of the GnRH agonist plus graded doses of testosterone resulted in mean nadir testosterone concentrations of 253, 306, 542, 1,345, and 2,370 ng/dl at the 25-, 50-, 125-, 300-, and 600-mg doses, respectively. Fat-free mass increased dose dependently in men receiving 125, 300, or 600 mg of testosterone weekly (change +3.4, 5.2, and 7.9 kg, respectively). The changes in fat-free mass were highly dependent on testosterone dose ($P = 0.0001$) and correlated with log testosterone concentrations ($r = 0.73$, $P = 0.0001$).

We can conclude that having higher testosterone levels, even within the normal range, would result in more muscle growth, better athletic performance, lower body fat and cholesterol.

But are the traditional testosterone boosters useful? Can they actually improve your testosterone levels? I think not, let's find out why.

Why the Traditional Testosterone Boosters Suck

Most of the ingredients found in a traditional test booster aren't effective. They are either disproved to be effective for testosterone boosting or are dosed poorly, resulting in the same – no positive effect on testosterone.

Here are some of the most common:

- ZMA (Zinc, Magnesium, Vitamin B6)
- D-aspartic Acid
- Tribulus terrestris
- Fenugreek

In [this study](#), the purpose was to determine Tribulus terrestris' effect on fat free mass and strength in athletes taking it over a 5-week period.

They split the participants in two groups: one group took Tribulus terrestris capsule daily and the other took a placebo.

After the 5-week period, both groups had gained a significant amount of muscle mass and strength. But, there were no significant differences between the two groups.

This [systematic review](#) took 11 studies that met their criteria set out to determine TT's effects on testosterone levels in those who took it. Their findings were as follows:

Literature available for the effectiveness of TT on enhancing testosterone concentrations is limited. Evidence to date suggests that TT is ineffective for increasing testosterone levels in humans, thus marketing claims are unsubstantiated.

Next we have ZMA. This is a combination of zinc monomethionine and aspartate, magnesium aspartate, and vitamin B6. And their effect on testosterone levels is like that of TT.

[This study](#) showed that ZMA had no significant effects on testosterone levels on people who weren't deficient in zinc. So, unless you're deficient in zinc, ZMA won't do jack for your testosterone.

Magnesium, on its own, [has been shown](#) to help increase serum testosterone levels.

Next, we have D-aspartic acid. Many claim it to be a great supplement that helps in muscle growth and raises testosterone. But, [this study](#) debunks both claims making it a useless supplement to take.

Lastly, we have Fenugreek. This supplement has been shown to increase testosterone but not in a healthy way. Check this video explanation out:

The bottom line on testosterone boosters?

Just because a product has a shiny label and makes false claims such as:

- Designed to speed up muscle growth.
- Aids in recovery.
- Improves energy and endurance.

Doesn't mean it can deliver ANY of the benefits.

Stay away from shiny-labeled supplements making false promises. Instead, spend more time naturally improving and maintaining your testosterone.

More reading materials:

- [The 30 Foods that Boost Testosterone: Your 30 Item High T Grocery List](#)
- [Intermittent Fasting is the Easiest Way to Increase Testosterone](#)
- [4 Must Have Testosterone Supplements \(That Actually Work\)](#)

CHAPTER 8

MASS-GAINER SUPPLEMENTS



Mass gainer supplements are getting some serious attention, especially among people who have trouble gaining weight (hardgainers). As usual, the promises are among the lines of:

- Helps you gain lean muscle mass fast.
- Makes the recovery faster.
- Stimulates protein synthesis.
- Contains BCAAs.

(Seriously, I'm starting to think these 'benefits' come from the same board meeting as the BCAAs' one.)

Oh, you don't say! It helps me build lean muscle mass fast? Oh, I'm sold!

I'm going to recover faster, too? Oh my, double sold!

Stimulates protein synthesis? I'm already in, let's get jacked!

Contains BCAAs?! Mind = blown!

When I look at most mass gainers out there, I cringe. The amount of bullcrap and broscience that surrounds them is just too much for my taste.

Here is why I consider mass gainers to be flawed and a waste of money:

1. It's not JUST about the calories.

When most newbies think about getting big, they think "Eat big." What they're missing is the quality of the calories and the macronutrients they need. Sure, a mass gainer might promise 1250 or 2500 calories, but what are those calories? Is there an adequate amount of proteins, fats, slow-digesting carbs? Are there enough vitamins and minerals to support bodily functions and well-being?

For the most part, the answer is no. Most gainers are filled with sugars, fillers, preservatives and more low-quality junk your body doesn't need and can't do jack with.

If you want to build lean muscle mass, you need a solid nutrition plan and hitting your macro and micronutrient requirements day after day. Filling your body with low quality crap just to hit some arbitrary calorie number is stupid.

You might as well be eating snickers bars. I mean, you still won't be making gains, but at least they taste good.

2. They are making false promises they can't deliver on.

Most of the promises they make are straight up lies. And in other cases, you can get the same benefits from eating real food. I bet you didn't expect that.

Promises like "Gain more muscle, faster." and "Aids in recovery." are more of a marketing tactic to ramp up sales rather than actual benefits of the supplement. They aren't backing their claims.

3. They are reinforcing the idea that mass gainers can mask/out-do a shitty diet.

Again, the promises they slap on the label make it seem as if the mass gainer itself is the only thing needed to get a great physique.

The problem is, many newbies who don't know any better fall for this crap and end up frustrated when they don't get the results.

To [build muscle mass](#), you need a hell of a lot more than just a crappy mass gainer. You need a well-structured training program, good nutrition, adequate recovery, and consistency.

No supplement out there can magically bypass all the requirements and make you gain loads of muscle. Period.

Here Is My Advice for Hardgainers, Using Better Alternatives

If you are considering a mass gainer, I urge you to think again. Most gainers filled with sugar and low quality ingredients. Also, the price per serving is also not much different compared to if you were to get those calories from real food.

And, if you need to eat a big amount of calories to gain muscle mass and find that consuming liquids makes it easier, check out this great homemade 'gainer' recipe:

There are many other recipes like this one. The best part is you can customize it however you like to fit your taste and make consuming more calories a pleasure.

CHAPTER 9

CREATINE SUPPLEMENTATION

Of the hundreds of workout supplements out there, creatine is one of the few I recommend. It is the most well-researched one with hundreds of studies behind it and it does work.

What Exactly is Creatine?

Creatine is a nitrogenous organic acid, comprised of three amino acids: glycine, L-arginine and L-methionine. Creatine is naturally found in meat, eggs and fish but because of the small amount, you'd need to eat absurd amounts every day to get enough.

How Does Creatine Benefit You?

Let's start at the core: Adenosine triphosphate (ATP) is a molecule that stores the energy we need to do just about everything, including lifting.

When the ATP molecule is used by the cells, it's broken down into smaller molecules that are then recycled, through various processes, back into ATP for re-use. That way, the cells always maintain a supply of this essential molecule.

And, the faster those ATP molecules can be regenerated, the more work your body can do. This included the ability to exert more effort into your workouts, set by set.

Second, we have Adenosine diphosphate (ADP) and Adenosine monophosphate (AMP) molecules. They are the lower energy molecules that form ATP.

But what does this have to do with creatine? Well, creatine serves the role of an "energy reserve" for our cells. It accelerates the process by which ATP molecules are reformed by donating a molecule called Phosphocreatine to the precursors ADP and AMP.

In simple terms, thanks to creatine, more energy cells are created faster, leading to [improved endurance](#), [faster recovery](#), all in a [safe and natural way](#).

But creatine is limited within your body. With the majority of it being made by the liver and a small amount derived from foods like red meat and fish. Once the small reserve of creatine is exhausted, your body turns to fatty acids and glucose to keep replacing ATP molecules.

This is where supplementing with creatine knocks the door down and enters. It allows for more creatine to be available for ATP production, thus improving your [athletic performance](#) and gym results over time.

Creatine has also [been shown](#) to have anticatabolic actions and [expression of certain genes](#) in relation to hypertrophy.

Which form of Creatine Should I Take?

With so many forms of creatine out there it can get confusing to decide which one to take. And to discover which one delivers the best bang for its buck is an even more tedious task.

Pills, liquids, powders, and more.

Most supplement companies promote newer, more 'superior' forms of creatine that, of course, cost more.

But are any of them better than the good ol' creatine monohydrate? Let's find out:

Liquid Creatine Serum

First off, liquid creatine's cost per serving is much more than that of creatine monohydrate. If you compare the price, it comes up to 2 to 3 times more.

Second, most of the claims made by supplement companies are completely irrelevant and un-backed. Such are: better absorption, less bloating, and easier on the kidneys.

On the contrary, not only is liquid creatine NOT in any way superior, but it's actually worse. [Research shows](#) that liquid creatine provides no ergogenic benefits. The theory is, [creatine converts to creatinine](#) within a liquid.

Creatine Ethyl Ester

Creatine Ethyl Ester is thought to be much more bioavailable, making it a more superior form. But, [researchers at Baylor University](#) took matter into their own hands. They compared CEE to standard creatine monohydrate.

Their conclusion:

In conclusion, when compared to creatine monohydrate, creatine ethyl ester was not as effective at increasing serum and muscle creatine levels or in improving body composition, muscle mass, strength, and power.

This is likely because once CEE enters the body, [it is converted into creatinine](#), making it ineffective.

Creatine Nitrate

So far, the only known advantage of CN compared to monohydrate is the fact that it is more water soluble and more pleasant to consume. Other than that, no studies have compared the two to determine which is more effective.

Creatine Hydrochlorite

This form is created by binding creatine with hydrochloric acid. The most popular claim is that CH is a more concentrated form and you wouldn't need to take as much to gain the benefits.

Those claims, however, have no ground and no studies have been made so far to determine whether CH is in any way better.

Creatine Malate

Creatine malate is created by binding creatine with malic acid. There is no real evidence to suggest that malic acid could have any benefits for us lifters. Furthermore, its conjunction with creatine hasn't been studied so far.

Buffered Creatine

Buffered Creatine is a form of creatine monohydrate with a higher pH level, claimed to be a 'superior' product over the standard monohydrate.

[One study](#) found that buffered creatine was in no way superior to CM. More research is needed to determine whether Buffered Creatine offers any benefits.

Creatine Pyruvate

Creatine Pyruvate is created by binding creatine with pyruvic acid. And much like the other forms, more research is needed to determine whether it is a more superior form.

For now, given what we know, I'm more on the err side.

What Is The Bottom Line on Creatine Supplements?

Given the facts, creatine monohydrate still rises high above the rest, and proves itself to be the best product for the price.

- It's the most well-researched product on the market, with proven efficacy.
- It doesn't present much side-effects, especially when taken in recommended doses.
- It's cheap. The average serving cost of 5g is no more than 10-20 cents (!).

How to Take Creatine?

[Research](#) shows that taking 3-5 grams of creatine per day is enough to maintain optimal levels.

There is an optional loading phase, where you initially take 20 grams per day for 5-7 days to reach saturated levels faster.

Your other option is to take 3-5 gram dose every day and reach the same levels of saturation within 3 weeks.

CHAPTER 10

SUPPLEMENT RECOMMENDATION FOR MUSCLE GROWTH

A quick note: I consider the supplements below to be the essential ones you can spend money on. And I recommend taking them during bulking periods. But you can and should also use them during fat loss periods.

Whether you also decide to take the fat-loss supplements I recommended above is up to you.

1. Protein Powder

If you don't eat [enough protein](#), you will hinder your body's ability to grow muscle mass and keep it during fat loss periods.

Using a protein powder isn't necessary to make gains but it can be a convenient way to reach your protein numbers for each day.

You can use standard whey or casein protein powder. If you want to use hemp or soy, however, I suggest taking it conjunction with egg, casein, or whey.

2. Creatine Monohydrate

With the endless studies behind it's back, creatine monohydrate has proven itself effective time and time again.

It's cheap, safe, and affordable.

3. Multivitamin

Getting enough of each vitamin and mineral is difficult and requires a diverse and healthy diet. Thus, a multivitamin supplement is a no-brainer.

But, there are a ton of low-quality products out there. I urge you to do your own research, use the knowledge from this guide and pick a good multivitamin supplement. One that actually delivers the essential vitamins and minerals your body needs.

4. BCAAs or L-leucine, under specific circumstances

Supplementing with BCAAs or L-leucine can help you with muscle mass maintenance and growth if you do fasted training.

If you want to take L-leucine in the morning, a 3-gram dose would be enough. But, if you prefer to take BCAAs, you'd need about 10 grams to fill the leucine needs.

CHAPTER 11

SUPPLEMENT RECOMMENDATIONS FOR GENERAL HEALTH

Some of you might not be interested in getting stronger or more muscular but only exercise for the health benefits. For you, I have a short list of supplements I recommend to take for general well-being.

1. Fish Oils

I didn't cover fish oil supplements in this guide but I definitely recommend them for general health. They are a great source of omega-3 fatty acids.

Omega-3 fatty acids (eicosapentaenoic acid—EPA and docosahexaenoic acid—DHA) are primarily found in certain fish like bluefish and herring. Not only are these essential fatty acids needed by the body to function properly, but they also [deliver many health benefits](#).

Fish oils have been shown to reduce stiffness and joint pain, battle depression, reduce blood pressure, improve memory and cognitive performance, and more.

Fish oils also [increase muscle protein synthesis](#), and reduce soreness after training.

But here's the important thing to know about fish oil supplements:

A lot of them are garbage, made in the cheapest way possible to maximize profit. To avoid buying garbage, you need to look at the EPA and DHA contents per serving.

Low quality fish oils often have as little as 150-200 mg per gram, making them ineffective. You'd need too many servings to reap the benefits.

The general recommendations for EPA and DHA daily dose ranges between 400 and 700 mg for each.

High quality fish oil could cost more than a cheap one. But if it contains enough in each serving to get your daily dose in, then it's likely a better investment.

2. Multivitamin

Getting your essential vitamins and minerals every day is going to ensure your body functions well, you feel energized, and helps prevent many diseases down the road.

3. Vitamin D3

Vitamin D is among the most important ones your body needs. Since [your body can't produce it without sun exposure](#), and there are few foods rich in vitamin D, supplementing with it is a good idea. Recommended daily dose of vitamin D is between 1000 and 2000 IU per day. Make sure the one you choose has an adequate amount per serving.

CHAPTER 12

SUPPLEMENT RECOMMENDATIONS FROM FELLOW FITNESS BLOGGERS

I'd like to finish this guide with some contributions from fellow fitness bloggers and experts. I asked each and every one of them a simple question:

“What are the 3 supplements you personally take and recommend?”

Sean Nalewanyj | Seannal.com

My answers would be any basic protein powder simply for convenience sake if it helps you hit your daily protein needs more easily... creatine monohydrate since it's the most research backed muscle building compound there is and is very inexpensive... and vitamin D3 since most people are not in the optimal range as is.

Ben Greenfield | Bengreenfieldfitness.com :

Fish oil and creatine, because they are so efficacious and so well-researched for both body and brain performance. The former, of course, only if not rancid and from a quality source. The third would likely be

cannabidiol (CBD), the legal, non-psychoactive form of THC for sleep and relaxation

Greg Nuckols | Strengththeory.com :

Proven for performance:

creatine, citrulline malate, caffeine, protein when I need it

Some promising early research, but not enough to say they work conclusively (and they're cheap, so just taking a better safe than sorry approach):

taurine, TMG (betaine anhydrous), spirulina

General health (better safe than sorry when I'm not getting much variety in my diet)

athlete vitamin from Citadel Nutrition (magnesium, zinc, K2, D3), garlic, and vitamin A.

Keith Lai | Fitmole.org :

Currently I'm taking caffeine pills (300 mg pre-workout 10 min before I workout), Whey protein powder (amount varies based on how much protein I get from actual food), 10 mg melatonin to help me sleep (taken 30 min before bed).

Menno Henselmans | Bayesianbodybuilding.com :

Here are 3 supplements I often recommend.

- 1. Caffeine. Not because it's that effective to enhance your performance, as it's not, [at least not in sustainable dosages](#), but simply because it makes your workouts more enjoyable.*
- 2. Creatine monohydrate. It doesn't work for everyone (I'm a non-responder myself), but for those that benefit from it, it's still the most effective supplement for strength trainees on the market and it's cheap to boot.*
- 3. Vitamin D3. Unless you're regularly exposed to a significant amount of sunlight, there's simply no other way to ensure optimal vitamin D levels and the benefits of this are innumerable.*

Richard Mugica | Redemptivefitness.com :

These are the three supplements that I cannot do without.

- Beta Alanine (6 grams pre-workout on training days; first thing when I wake up on non-training days)*
- Citrulline Malate (8 grams pre workout)*
- Creatine (5 grams daily)*

Ryan Andrews | Precisionnutrition.com :

Here are four supplements I regularly use. I don't automatically recommend them to everyone else. I'd only consider recommending them to someone else if they were in a similar situation to me.

- 1. Algae based omega-3*

I like to get a direct source of DHA/EPA in supplemental form since the only source I get in my diet is ALA from flax, hemp, walnuts, canola, and chia. And I prefer algae to fish as it better aligns with my environmental and animal welfare values.

- 2. Vitamin K2*

I don't eat food sources with K2, and at this point I'm not sure how much my body is producing. So I take a low

dose K2 supplement to be safe.

3. Vitamin D3

I live in Boston. And work indoors. So my vitamin D tends to run borderline low. I use a supplement for 9 months out of the year (I volunteer at a farm outside in the summer so I tend to do ok during those months without a supplement). I get tested annually to make sure I'm not running too high or too low.

4. Zinc

About four days per week I like to use a zinc supplement. I find that my immune system does a bit better. And I don't always get enough in my diet.

Josh Bryant | Joshstrength.com :

I'll give you my 3:

1) Fish Oil

2) Magnesium

3) Glucosamine

Nick Nilsson | Fitstep.com :

My three most-recommended supplements that I take pretty much every single day are as follows:

1. "Greens" supplement. The brand I take is Athletic Greens. It's essentially a powdered "real food" multivitamin. This is nutritional insurance for when the food I'm eating doesn't completely cover all the nutrients I need. This is a supplement that I HIGHLY recommend and it's one that I never go without.

2. Micellar Casein/Whey protein blend. This is what I use to increase my protein intake, especially post-workout. The blend of these two proteins is highly anabolic.

3. Mineral Combo...Magnesium, Zinc and Iodine. I find these to be the three biggest impact minerals to take. Most people are deficient in all three of these. They're tough to get enough of in food and they're critical for anybody training hard.

Chad Howse | Chadhowsefitness.com :

Protein, creatine, and a greens supplement. Creatine has been tested and proven more than any other supplement. Protein is simply something we need more of if we're training.

And a greens supplement just helps me get nutrients I'm lacking.

Mikaela Kelsall | Fitmik.com :

So this is sort of three but also not really...the pre-workout mix is something I take together so I thought I'd throw it all in.

Protein powder

Protein powder is fantastic for this as it can be consumed quickly and is incredibly easy to store and carry. Also assist in hitting daily protein targets. If I haven't eaten enough protein for the day then a protein shake is the perfect way to rectify this. It's quick, it's easy, and it can be consumed in about 30 seconds flat.

Greens powder

It pains me to say it but I don't eat enough vegetables. Having a greens powder is therefore absolutely

necessary for me to ensure that my body is getting the nutrients that it needs. The one I personally used it called Vital Greens , which contains 76 ingredients. Greens such as wheat grass, spirulina, kale, and spinach contain amino acids, vitamins, fibre, minerals, and also contain many antibacterial properties. They have amazing benefits for your health including lowering cholesterol, fighting cancer, fuelling your body, preserving vision, and boosting bone health. Using a powdered greens supplement makes it that much easier to ensure you are consuming enough of these nutrients on a daily basis- mix a spoonful with a glass of water, drink it, and you are free to go about your day in about 17 seconds.

Pre-workout mix

I don't waste my money on brand name pre-workouts that are sold by supplement stores. These products are generally over-priced and you can't be sure exactly what and how much compounds make up the mix you're consuming (there tend to be also a lot of filler ingredients that aren't overly beneficial but have the effect of increasing product weight). For these reasons, I make my own pre-workout mix using 3 ingredients that are commonly used in pre-workout powders. Together they assist me with energy and focus to power through my workouts at 100%.

Caffeine

The reason why I like to take caffeine pre-workout is because it boosts metabolism and energy and enhances stamina during exercise. It increases alertness and temporarily fights off drowsiness, which is basically exactly what I need to get to the gym early in the morning or after a long day. I consume caffeine about 20-30 minutes prior to working out in the form of black coffee.

Acetyl-L Carnitine

Carnitine is mostly known for its ability to assist in fat loss. While this is undoubtedly a fantastic benefit I use it more for its proven power to improve high intensity work capacity, athletic performance, and recovery time.

Beta Alanine

The presence of beta alanine in the bloodstream is directly linked to muscle carnosine levels. In every study to date it has been shown that beta alanine increases muscle carnosine in human subjects. This can be starkly contrasted with other supplements, take creatine for example, where results have been a combination of positive and negative. Carnosine is a potent antioxidant that also fights muscular fatigue. Beta alanine therefore boosts muscle strength, training volume, and high-intensity exercise performance making it a staple in my pre-workout routine.