

You should always **consult** with **your physician** or other health care professional before taking any medication or nutritional, herbal or homeopathic supplement

The question I hear the most at the gym and from clients is definitely “What supplements do you take?” Let’s cut to the chase: a supplement is there to **supplement** your diet, not to replace it.

Before you even worry about supplements, I would like to go over three main pillars of muscle building. Having all three of these “pillars” will allow you to continue to build and maintain muscle mass over a long period of time.

Pillar #1: Strength Training Close to Failure

Let's briefly go over the subject. First off, if you are not training, it is extremely unlikely you will put on any significant amount of muscle mass. For optimal muscle growth it is recommended training zero to four repetitions away from failure while training with enough volume per muscle group. Different muscle groups require varying amounts of stimulation for growth. For example, calves that are generally known to be hard to grow usually require a lot more sets and reps for growth. Whereas biceps fatigue comparatively quickly and do not require as much volume for growth. Additionally, different muscles can take on different loads and have different recovery times. For example, the upper trapezius of the back has a very small eccentric phase, also known as the muscle lengthening action, as well as small range of motion. Thus, it generally will recover faster than the hamstrings, which have an extremely large eccentric action. It is recommended as you move throughout your mesocycle, typically four to seven weeks of training, you train closer and closer to failure. For example, in the first two weeks of training, stop your sets four reps from failure, and as you progress through the mesocycle, eventually go to zero or one rep from failure. As you build cumulative fatigue, fatigue that builds on itself week to week, throw in a deload week when you feel burnt out or ideally at the end of your mesocycle. A deload week usually includes you doing the same exercises but at half the amount of weight and half the amount of reps. This will help you get ready for your next mesocycle via recovery of your connective tissue, tendons, nervous system, muscles, etc.

Pillar #2: A Sufficient Protein Intake

There are times when it is hard to reach your macronutrient and caloric goals. Macronutrients are a fancy way of saying protein, carbohydrates, and fat. You need to give your body the “raw materials” to build and maintain that muscle mass. Well, how much do we need? We need enough protein to accomplish muscle growth, and for all other vital functions. I recommend approximately 1g of protein times your body weight in pounds. For example, to ensure a 200 lbs individual will maximize growth, they will need an average of 200g of protein daily. Getting protein in every three to five hours has been proven to be the most effective for absorption, and turnover into muscle mass. Being around the three-hour mark is most optimal, but if you are unable to do that than five hours is fine. Getting enough protein in your diet reduces the breakdown rate of muscle tissues, thus maintaining the muscle mass you have. Sufficient protein also aids with protein synthesis. You have probably seen quite a few YouTube videos of people saying, “there’s no such thing as too much protein, just keep eating it.” This is not true--If we are eating too much protein then we can go into an excessive hypercaloric state where we are putting on too much fat. Secondly, we are missing out on the function of carbohydrates and fats in the diet, which are helpful for energy as well as many other biological functions. Usually, animal-sourced protein is of higher quality than vegetable protein. Animal-sourced protein being meat, eggs, milk, etc. However, you can still build a significant amount of muscle with a vegan or vegetarian diet.

Pillar #3: A Hypercaloric Diet

Hypercaloric means being in a surplus of calories past your energy demands. When it comes to this, the second law of thermodynamics can be connected here, as that muscle mass **MUST** come from somewhere. Not only do we need the calories themselves to build muscle, but we also need an excess number of calories to wake up systems that help in building muscle. When you are hypercaloric, testosterone tends to go up as well as insulin levels. These anabolic hormones help a lot building muscle mass. Simply put, being in a hypercaloric diet such as an excess of 300-500 calories a day is recommended for hypertrophy purposes. Typically, we do not want to go much over putting on a pound a week or it will be likely we will put on a substantial amount of fat relative to the amount of muscle

put on. Unfortunately, to build a significant amount of muscle, you will need to put on some fat.

If you apply these concepts, you are well on your way to building a significant amount of muscle mass! You can put on muscle with virtually any type of dieting style if macronutrient and caloric values are met. Please also keep in mind, sleep an adequate amount. This will aid with recovery as there is no substitution for a good night's rest.

Essential Amino Acids (EAAs)

More specifically the names of these acids are isoleucine, leucine, valine, lysine, methionine, phenylalanine, threonine, and tryptophan. These EAAs play a large role in protein synthesis. Multiple studies have proven supplementation with EAAs post workout is linked to higher levels of muscle mass. EAAs must be obtained through consumption as they are not produced in the human body. These acids are primarily found through animal-sourced products. Instead of purchasing the supplement, you can consume fish, meat, or eggs post workout. Virtually every whey protein brand contains all EAAs. If you are supplementing with whey, or eating enough animal-sourced protein, then I do believe buying EAAs separately is usually overpriced and a waste of money.

Creatine Monohydrate

Of the hundreds of supplements out there, creatine monohydrate is the most science-backed supplement. Creatine is a molecule that is naturally produced in the human body. Studies, again and again, find an increase in lean body mass, strength, anaerobic capacity, as well as power output while taking creatine. This supplement is extremely useful in building muscle mass. It increases water retention of the muscle, which allows you to lift more weight and perform more repetitions, thus producing more total volume and therefore increased muscle mass. There are a few studies that claim that some people respond better to creatine; these “responders” typically have more fast-twitch than slow-twitch muscle fibers, and these people will tend to retain more water while taking creatine monohydrate. Non-responders do not receive as significant of a benefit from taking creatine monohydrate, tend to be more slow-twitch, or tend to be older in age.

There are so many forms of creatine that supplement companies try to promote such as creatine citrate, creatine HCL, creatine ethyl ester, etc. The claims that these forms are more effective than creatine monohydrate are unfounded and unlikely.

So, when is a good time to take creatine? Post workout seems to be optimal. Also, absorption tends to increase if creatine monohydrate is taken with carbohydrates and protein. There are two protocols for taking creatine monohydrate. The first would be taking a loading week of 20g/day for five to seven days, then maintenance of 3-5g/day to keep creatine stores high. The second protocol is to skip the loading phase and take 3-5g/day from the beginning. Both protocols will help raise muscle creatine content, however, it will take about a week to fully load creatine stores with protocol one, and about a month with protocol two. Some individuals claim cycling ingestion of creatine monohydrate is necessary, however, this has been deemed unnecessary. The body does not build a tolerance to creatine monohydrate as it does caffeine, so cycling off it is unnecessary. Things to keep in mind while taking creatine are to stay hydrated as it increases intracellular water retention, and if you are doing a loading phase space out the 20g throughout the day to avoid cramps or diarrhea. There are a few claims that creatine monohydrate impacts the rate of hair loss. This is due to creatine monohydrate increasing dihydrotestosterone (DHT) levels. However, this will only affect you if you carry male pattern baldness and it is important to note that the connection between creatine monohydrate and male pattern baldness needs to be studied more. In conclusion, supplementing with creatine has been proven to increase maximal power, strength, lean body mass, enhanced recovery, and reduce fatigue. Furthermore, this supplement is generally inexpensive and safe. I highly recommend supplementing with creatine monohydrate.

Caffeine

Right next to creatine monohydrate for sports supplementation is caffeine. This supplement has been studied in caffeine powder form, pre-workouts, coffee, and even tea. This central nervous system (CNS) stimulant is the most widely used psychoactive drug on the planet. There are three main reasons caffeine may be beneficial while training. It increases power, improves muscular endurance, and suppresses fatigue. Your body gets desensitized to caffeine intake so the best suggestion would be to cycle taking caffeine to re-sensitize your body. Every one

to two months try to take two to seven days completely off caffeine. The longer and more caffeine you have ingested the more time you will need to take off. It is common to get withdrawal headaches while you are taking your days off. Taking caffeine may reduce sleep quality, especially if you take this supplement late at night. I recommend starting out with a small dose of caffeine and up it as necessary as individuals have different levels of sensitivity to it.

Whey Protein

Take whey protein as needed to reach daily macronutrient targets. To optimize muscle growth spread out your protein feedings four to six times a day. There is a lot of research that shows that taking protein during your workout, otherwise known as an intra-workout protein meal, is very helpful for building muscle mass if the workouts last over an hour. Also, make sure you are reaching your general protein requirements every single day, even on days you do not work out. Does the brand of protein matter? Not really. There is a very small difference in absorption rates between top tier expensive whey, and cheap grocery store whey. I recommend finding a whey protein that tastes good for you and you do not mind taking long term.

Casein

Casein is a slow-digesting, dairy-based protein. This is known as the time-release supplement as it has a slow absorption rate in the gut. It gives your cells amino acids at a low level over a long period of time (compared to whey, which is quickly absorbed and spikes amino acid levels). It would be most beneficial to take casein before you go to sleep as it will reduce muscle catabolism. It is also helpful to take casein when you know you will not ingest protein for an extended period such as when traveling.

Carb powder

This allows you to get in carbohydrates during your workout extremely easily. This is best in the forms of 10-20g of sugar during your workouts. If you have a decent meal with carbohydrates before your workout then it is not necessary. It is helpful for workouts that last longer than an hour and aids with post-workout glycogen resynthesis. This glycogen resynthesis helps with insulin secretion, which then promotes muscle growth. This doesn't have to be in powder

form; many athletes have a banana or candy during their workouts for that fast spike in energy. Carb powder replenishes glycogen stores during your workout to help you continue with your long workouts and potentially do more repetitions.

Thank you for taking this time to read this eBook. I hope you found some useful information and wish you a healthy and happy life. Cheers!

Moses Reuben