

## Top Ten Minerals For Bodybuilders

What every bodybuilder should know:

You know all those monsters you see in the magazines month after month, the ones you've been working your butt off to look like? Well, take heart. The fact is, they don't train much differently than any of us mortals do.

Ok, sure, they probably work out with heavier weights and more likely than not are genetically gifted for bodybuilding, but if you get a chance to hang around the greatest athletes in the sport, you come to realize that it's their concern for the little things, like dietary and training details, that separates them from the average Joe in the gym.

These details include really warming up before a workout, actually weighing food, planning the day's meal in advance and so on. From studying many of these athletes, it's easy to conclude that this attention to seemingly insignificant minutiae is what makes great bodybuilders stand out from the rest.

For instance, when was the last time you gave any thought to your dietary mineral intake? No, I don't mean popping a few supplements occasionally, I mean really taking a good look at the level of minerals in your diet. If it's been a while, you're not alone.

Many bodybuilders give little thought to those elements in their diets that don't provide calories. That's a big mistake, because your diet contains plenty of vital components that do more than just provide energy, like supporting muscle tissue, enhancing growth, etc. In fact, these nutrients, called micronutrients, may be more important for bodybuilders than calorie producing nutrients precisely because of these other physiological functions.

The purpose of this article is to review the top 10 dietary minerals from a bodybuilding perspective. Will it really make a difference for you to become familiar with this stuff? Not if you're as muscular as you want to be. After all, these are just the little things.

When considering how important a dietary mineral is in bodybuilding, we can look at the sport's nutrition research to answer at least one of four questions.

- Is the mineral directly involved in muscle action, protein synthesis, or the integrity of the muscle cell.
- Does exercise result in an increased requirement of that nutrient for an athlete?
- Do athletes typically have suboptimal intakes of that mineral?
- Does dietary supplementation with that mineral improve performance and growth?

With these questions in mind, we can now review the minerals that best promote increases in strength and growth. Here is our list, in reverse order.

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### 10. Potassium

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This mineral is an important electrolyte found within muscle cells and works closely with sodium to regulate body water levels. As well, Potassium plays a critical role in facilitating the electrical potentials across nerve and muscle cells that result in muscle contraction. Potassium is even involved in glycogen storage (for high intensity muscular energy). A poor potassium / sodium balance can lead to improper fluid levels, dehydration, muscle cramps and weakness. Fortunately, dietary intake of potassium is generally not a problem for most people, but bodybuilders should become familiar with its role and the foods where it can be found.

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### 9. Copper

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The trace mineral Copper may soon prove more vital to bodybuilders than was previously thought. It's included in this list not because of its involvement in oxygen transport and utilization (as well as many enzymatic reactions, not the least of which is helping in the production of noradrenaline) but because Copper has been shown to increase in the bloodstream during intense exercise. This fact leads to the conclusion that copper plays a direct role in high intensity muscular work such as bodybuilding, and that there may be conditions under which some bodybuilders ingest suboptimal amounts. Although most folks probably do take in enough copper, it's a good idea to monitor your copper intake. You'll likely hear more about this mineral in the future.

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## 8. Vanadium

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This is a nonelectrolyte mineral that has received much recent attention in the bodybuilding community due to the perceived effects of one of its salt forms, vanadyl sulfate. Vanadium is to sea creature what iron is to humans; it makes a jellyfish's blood green like iron makes our blood red. Although the vast majority of research on Vanadium supplementation has been carried out on diabetic rats, the published results tend to show a promising glycogen storing effect on muscle tissue. This may explain the subjective analysis of some bodybuilders who swear they feel 'harder' after taking vanadyl sulfate. Problem is, we really don't know much yet about vanadyl sulfate's effects on athletic performance. Nor do we know much about the long term effects of supplementation with vanadium salt, but there is a theoretical mechanism of action and at least some promise.

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## 7. Iron

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You may be aware that the mineral Iron is a constituent of hemoglobin and is responsible for oxygen transport and, indirectly, subsequent oxidative energy production. What does this have to do with bodybuilding? Well, your ability to recover between sets is related to the efficiency of your aerobic system. The more oxygen you can supply to your working muscles, the quicker your muscles can recover in time for another hard set.

Moreover, Iron is particularly critical for female bodybuilders. Women lose some Iron in their menstrual flow every month. As well, female weight trainers, who typically don't consume much red meat, which is high in iron, may not readily replace vulnerable iron stores. Therefore, female bodybuilders run the risk of anemia if they're not careful about iron intake.

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## 6. Phosphorus

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A mineral that is present in the body in large amounts, phosphorus is directly linked to exercise metabolism since it produces high energy molecules such as Adenosine Triphosphate (ATP) and Creatine Phosphate. Phosphorus works in conjunction with Calcium, so it's important to keep phosphorus and calcium intakes close to a 1:1 ration; an imbalance creates a potential nutrition problem. Of further interest, phosphorus supplementation has been shown to decrease blood lactic acid levels during exercise.

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## 5. Sodium

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As most bodybuilders know, Sodium is an electrolyte that plays a vital role in the regulation of body fluids. The level of sodium in the body determines the amount of water the body will 'hold', and high intakes can cause body tissues to swell. (It is not uncommon to look like 'Quasibloat' and be up to two pounds heavier the morning after scarfing down a Big Mac and large fries.) Although a normal diet usually contains a reasonable amount of sodium, be careful not to limit sodium intake too much at contest time to get an ultra shredded look. An excessively low sodium intake turns on protective mechanisms within the body that cause sodium and water retention. Finally, keep in mind that sodium plays a major role in resistance training; its function in nerve impulse transmission and muscular contraction is critical to bodybuilders. Dietary sodium isn't all that bad, it's having the right amount that's important.

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## 4. Chromium

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The trace element Chromium is the key part of glucose tolerance factor, a substance that helps insulin bind to its receptors on tissues. In other words, Chromium helps insulin do its job of transporting glucose, amino acids and fatty acids into cells. Athletes probably need more Chromium than nonathletes, but whether chromium is truly anabolic is a bone of contention among scientists. The fact is that chromium appears to help glucose metabolism and probably helps in lipid metabolism but has not yet been clearly established to increase lean body mass. Claims of ripped, freakish physiques from chromium supplementation are premature, to say the least. However, this mineral weighs in at number four because athletes must become more familiar with its role in physiology.

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## 3. Zinc

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Think Zinc for growth. That's right, the mineral zinc is involved in virtually all phases of growth. Even more critical for bodybuilders, studies have shown that high intensity exercise stimulates excessive zinc loss. Further, diets of some athletes have been found to be low in zinc. This potential double-edged sword, excess loss coupled with

possible low intakes, moves zinc into our number three position. If you're not mindful of your zinc intake, your growth may be stymied.

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## 2. Calcium

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The most abundant mineral in the body, Calcium is the second most important mineral for bodybuilders. There are several reasons for this.

- Bodybuilders may have difficulty maintaining the needed 1:1 calcium to phosphorus ratio. First, many lifters try to avoid dairy products (containing calcium) because of a relatively unfounded fear that they will 'smooth them out'. Second, a typical bodybuilding diet is high in protein, meaning that it's also high in phosphorus (further throwing off this ratio) and causes excess amounts of calcium to be excreted in urine.
- Calcium is the primary mineral involved in muscular contraction (ever heard of calcium ions in the 'sliding filament theory of muscular contraction'?)
- The structural stress from weight training requires a steady supply of calcium to maintain high bone density.
- Female athletes need to be especially careful of their dietary calcium intake, as low estrogen levels can contribute to decreased calcium absorption and increased calcium loss. Also, keep in mind that Vitamin D help with calcium absorption, making vitamin D fortified dairy products a good source of this mineral.

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## 1. Magnesium

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Magnesium takes the number one spot not only because it has a theoretical mechanism of action (a plausible way it can help bodybuilders) but also due to recent studies identifying the performance enhancing benefits of magnesium supplementation.

Magnesium's role in bodybuilding revolves around energy production and protein synthesis. Studies on many different types of athletes have revealed excessive magnesium losses in sweat. Unfortunately, bodybuilders probably don't make up for these losses in their diets, as many food high in magnesium (nuts, legumes, etc) do not typically top a bodybuilder's grocery list.

Brilla and Haley from Western Washington University in Bellingham recently published the results of a research study in which magnesium supplemented lifters exerted greater quadriceps force than unsupplemented lifters. Considering magnesium's role in bodybuilding, factors leading to a possible suboptimal magnesium status in athletes and results of research such as this, it's not hard to see why so many sports nutrition specialists working with strength / power athletes are excited about magnesium's potential.