

Supplement Review, Calcium

Researched and Composed by Seksi

Introduction

As hardcore gym warriors we are constantly bombarded with obstacles aimed at suppressing our bodies ability to grow. Many of these obstacles are easy to spot and overcome; diet, protein intake, overtraining, etc. Others, are not so easy to spot; central nervous system (CNS) adaptations, mitochondrial density limitations,, etc etc.

In this article we will be taking a look at calcium. The well-known (and extremely abundant!) mineral which rarely receives the attention it so deserves.

Calcium is the most abundant mineral in our entire body. Calcium is responsible for the regulation of our heart beat, blood pressure and water. It is also used in blood clotting, the maintenance and formation of bones and teeth and the conduction of electrical impulses in the nervous system.

However, as elite athletes we are more concerned with calcium's ability to turn on muscles! For us to fully understand this process we must go through exactly how a muscle contraction is triggered. Here are the steps followed in all muscle contractions:

- i. Muscle contraction is initiated from somewhere in the body's CNS, either being initiated voluntarily from the brain or as a reflex instigated by the spinal cord.
- ii. A motor neuron in the spinal cord is activated and an action potential (electrical signal) transverses out.
- iii. The axon branches to supply a number of muscle fibers called a motor unit, and the action potential is conveyed to a motor end plate on each muscle fiber.
- iv. The action potential releases packets of acetylcholine into the synaptic cleft on the surface of the muscle fiber. Acetylcholine is a chemical that carries information across the synaptic cleft (the space between two nerve cells).
- v. The action potential spreads inside the muscle fiber and enters the cell through the T-tubule.
- vi. The action potential opens the doors of the sarcoplasmic reticulum (where calcium is stored).
- vii. The now released calcium ions flow into the cytoplasm.
- viii. Calcium ions bind to troponin-tropomyosin molecules which are located in the grooves of actin filaments. When contraction is not about to take place the tropomyosin covers the sites where actin and myosin can form crossbridges.
- ix. The bound calcium ions cause the troponin to change shape and result in the tropomyosin sliding out of the grooves, exposing the actin and myosin sites.

- x. The myosin and actin reciprocate by cycling crossbridges. The muscle shortens and force is a result.

As you can see, calcium plays a huge role in the triggering of a muscle contraction. Without it our muscle simply could not function!

The majority of Americans do not get enough calcium in their diets. Now, being bodybuilders we consume an adversely large amount of protein throughout the day. High protein diets cause more calcium to be lost through urine. Also, Weight training does strengthen bones, however, high lactic acid production inhibits the re-absorption of calcium. And since we're training "beyond failure" our lactic acid production is sky high! This means that bodybuilders have an even higher risk of becoming deficient!

Having a deficiency of calcium will greatly affect your performance in the weight room and in all other parts of your life. Check out the symptoms of a deficiency, some of them are not very pleasant:

- Muscle spasms and twitches
- Muscle cramps
- Nervousness
- Slow wound healing
- Insomnia
- Elevated cholesterol levels
- Brittle nails
- Heart palpitations (irregular rapid beating)
- Aching joints
- High blood pressure
- Tooth decay
- Rheumatoid arthritis
- Irritability

By now I'm sure you're getting the point, you need to be supplementing with calcium! But how much calcium do we really need? I recommend that you supplement with 1000 milligrams of calcium carbonate or citrate (the highest quality forms) per day. However you can go all the way up to 2000 milligrams if you're a larger bodybuilder producing large amounts of lactic acid, just make sure you take it in two doses.

For the best absorption use a calcium supplement that contains both vitamin d and magnesium as they both increase absorption and usage. Also, our large protein consumptions also produce large amounts of metabolic waste, which raises the acidity of our blood. This decreases our kidneys ability to reabsorb calcium. We can work around this by consuming more vegetables and fiber throughout the day. Fiber acts as a buffering agent which helps to lower the acidity of our blood. Also, studies have shown that calcium is best absorbed while sleeping. This means that you should take your calcium after the final meal of the day as it contains large amounts of fiber and is taken just before sleep. The only other method of supplementing with calcium that has been proven is smaller doses spread throughout the entire day, which can become rather tedious. However it can be more effective.

Conclusion

Novice bodybuilder or veteran, you should be supplementing with calcium.

Sincerely

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