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VITAMINS AND MINERALS

Bio-Synergys comprehensive guide to vitamins and minerals. In this short guide we explain which vitamins and minerals will take your training to the next level.



The foods we eat contain vitamins and minerals. These micronutrients provide our bodies with the ability to perform countless biological activities such as hormone production (testosterone) bone formation and immune system support.

Minerals are found naturally occurring in the soil and the production of vitamins begins with photosynthesis (plants creating energy from sunlight). A deficiency in any single vitamin or mineral may interfere with your body's ability to function properly which could ultimately hinder performance.

It's Dinner Time... Do You Know Where Your Vitamins Are?

Theoretically, you can meet your daily requirements of vitamins and minerals from eating a wide variety of whole foods. That means consuming plenty of fruits, vegetables, grains and meats every day. In other words, different types of foods will offer different types of vitamins and minerals; for example, lean ground beef offers plenty of iron, milk provides calcium, nuts and seeds provide vitamin E. If you're eating a widely varied diet that includes meats, fruits, vegetables, dairy, nuts and seeds you may have adequate vitamin and mineral intake.

Let's stop for a minute and summarise some of the key points. Although you could theoretically meet your entire vitamin and mineral needs through nutritional wholefoods, there are a few variables to consider. Some of these variables are summarised as follows:

- There is a theory that farming soils are depleted of nutrients because of over-farming, contributing to fruits and vegetables having less than optimal levels of nutrients
- You need to eat a wide variety of fruits and vegetables daily
- Extreme cooking of vegetables under high temperatures can significantly reduce their vitamin content
- Smoking may contribute toward losses in calcium, vitamin C and B vitamins
- Alcohol consumption may contribute toward losses in C and B vitamins
- Coffee may contribute toward losses in calcium, vitamin C and B vitamins

If any of these factors are of personal concern, there is a possibility that consuming additional vitamins and minerals may benefit you. Although some nutritionists frown upon vitamin and mineral supplementation, there is some agreement that certain groups of the population may benefit. These groups include the following examples:

- Female athletes, due to their tendency to minimise their caloric intake
- Women in general are at risk of iron deficiencies
- Strict vegans and vegetarians can be at risk. Some key nutrients can only be obtained from consuming foods from animal sources or consuming fortified foods
- High fiber diets may suppress the optimal absorption of micronutrients
- Athletes who regularly engage in calorie restricted diets while maintaining an active lifestyle may be at risk for nutrition deficiencies

Should you supplement your vitamin and mineral intake or not? The following questionnaire may help you formulate a decision.

1. Are you a vegetarian or a strict vegan?
2. Do you regularly engage in strenuous activities?
3. Are you guilty of not eating several servings of green vegetable each day?
4. Are you guilty of not eating several servings of red, yellow and orange vegetables each day?
5. Do you eat canned vegetables?
6. Do you boil or fry your vegetables?
7. Do you ever engage in calorie restricted diets?
8. Do you have a high stress job?
9. Are you regularly stressed due to personal situations?
10. Do you smoke?
11. Do you drink regularly?
12. Are you a 'partier' (regular, excessive drinking)?
13. Do you drink caffeinated beverages such as coffee, tea or colas?
14. Do you regularly eat fast food?
15. Do you regularly get sick (barring real medical issues), such as frequent colds?
16. Do you eat 'store bought' vegetables and not vine ripened organic ones?

If you answered yes more than you answered no, you could be a candidate for needing additional vitamin and mineral intake.

Minerals

Minerals are considered to be 'non-organic' because they are found naturally occurring in the earth. In other words, they are not produced by any living organism... they're just there! Minerals are some of the lowest common denominators of life. They cannot be broken down, metabolised or processed into another form. Some of these basic elements include:

- Calcium - Potassium - Magnesium



- Zinc - Copper - Iron
- Sodium - Selenium

These minerals (and many more) are the very foundation of our body's structure and existence. Aside from all of the water (around 70%) our bodies are largely comprised of various minerals.

Vitamins

Vitamins are considered to be 'organic' because they are produced from living organisms. Most vitamins are produced from plants when they absorb energy from sunlight. This energy, when combined with water and carbon dioxide in the plant, produces carbohydrates, oxygen and vitamins.

Vitamins act as catalysts to processes in the body. They help to optimise countless biological functions, ensuring that your body is working to its full potential. Vitamins do not provide energy in themselves; instead they assist in producing energy.

For example, B vitamins play a very important part in releasing energy from foods and the metabolism of carbohydrates.

Vitamins are classified into two general categories; fat and water soluble. The terms fat soluble and water soluble simply refer to how vitamins are transported and stored in the body.

The fat soluble vitamins A, D, E and K are transported with fats throughout the body and are stored in fatty tissues and the liver. Since they store in fatty tissues, fat soluble vitamins stay in the body for an extended period of time.

Water soluble vitamins C and B-Vitamins move a little freer as they are transported along with water through membranes. They are eliminated from the body fairly quickly.

Vitamins, Minerals and Free Radicals

Many vitamins and minerals offer antioxidant protection against the damaging effects of free radicals. Free radicals are molecules that lack a stable electronic charge. Every molecule should have a pair of electrons in an outer orbit circling opposite each other... kind of acting as a counter balance to each other. If there is only one electron in this outer orbit, there is an imbalance and the entire molecule becomes unstable. In order to become balanced again, the unstable molecule 'searches' for another molecule in order to 'steal' the needed electron.

In our bodies, the free radical may 'steal' the needed electron from a healthy cell. The healthy cell could be a muscle cell, fat cell, tendon, bone and almost any other example you can think of. Once the free radical 'steals' the electron from the healthy cell, the once healthy cell is now unstable and essentially becomes a free radical. It 'steals' an electron from the neighbouring cell which in

turn becomes unstable. This process can easily get out of hand and spread through healthy tissues.

Free radicals move throughout the body where they can kill cells, disrupt membranes and destroy enzymes. When you cut into an apple and let it sit for a few minutes, the flesh begins to discolour. This process is called oxidation and is a visual example of what free radicals can do to the cells in your body. It is thought that free radicals may be responsible for a variety of diseases and ailments.

Unfortunately, there is no way to avoid free radicals... they are everywhere. A major misconception is that they only come from pollution; not true. Although pollutants such as exhaust fumes and smoke may increase free radicals, so do a lot of other things. You'll ingest free radicals no matter what you do, no matter where you go.

Take a drink of coffee... you are getting them. Have a sandwich... they are probably there. Even strenuous exercise can increase the effects of free radicals in the body. The answer to combating free radicals is in the refuge of antioxidants.

Anti-oxidants have the ability to 'share' electrons with free radicals, resulting in a free radical that attaches to an antioxidant instead of a healthy cell thereby neutralising it.

Some examples of common anti-oxidants are: Vitamin C & E and Green Tea.

We are fortunate that some vitamins are water soluble and some fat soluble. This helps us to get antioxidant support in all areas of our bodies; both the liquid and the fatty regions. By the way, not every fatty region of the body is around your belly or thighs! Your muscles for example are protected with a sheath of fats, as is your brain.

Note: Although many people may be able to meet their daily requirements for micronutrients from whole foods, active individuals may want to supplement their diet with some form of vitamin and mineral product in order to guard against nutritional deficiencies.



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