

The Science of Nutritional Supplementation

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Supplementation

Alanine

Arginine

Asparagine

Aspartic acid

Cysteine and cystine

NAC(N-acetyl-cysteine)

Glutamic acid

Glutamine

Glycine

Histidine

Leucine and isoleucine

Lysine

Methionine

S-acetyl-methionine

Phenylalanine

Praline

Serine

Taurine

Threonine

Tryptophan

Tyrosine

Valine

Micronutrients

Functions

Terminology

Vitamins

Vitamin A

Beta-carotene

Vitamin B complex

Thiamin (Vitamin B1)

Riboflavin (Vitamin B2)

Niacin (Vitamin B3)

Pantothenic acid (Vitamin B5)

Pyridoxine (Vitamin B6)

Vitamin B₁₂ (Cobalamin)

Biotin

Folic acid

Vitamin C

Vitamin D

Vitamin E

Vitamin K

Vitamin-like substances

Choline

Inositol

PABA

Minerals

Boron

Calcium

Chromium

Copper

Iodine

Iron

Magnesium

Manganese

Molybdenum

Phosphorus

Potassium

Selenium

Silicon

Vanadium
Zinc
Other popular supplements
Activated charcoal
Alpha-lipoic acid
Anthocyanins
Antioxidants
Bee products
Beta-sitosterol
Bilberry
Bromelain
Caprylic acid
Carnitine
Carotenoids
Catechins
Chitosan
Chondroitin sulphate
Coenzyme Q10
Creatine
DHEA
Digestive enzymes
Flavonoids
Gamma-oryzanol
Glucosamine
Glutathione
Grapeseed extract
Grapefruit extract
Green tea
Gugulipid
Ipriflavone
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EXCERPTS

The Science of Nutritional Supplementation

“When you know a thing, to hold that you know it; and when you do not know a thing, to allow that you do not know it - this is knowledge.”

~ Confucius~

We are exposed today to a vast array of nutritional supplementations, in various chemical combinations and each of them claiming ownership over quality! Which one should we choose? But more importantly, why?

The material presented in this section will attempt to answer some of these questions. As the name suggest, “Nutritional Supplementation” attempts “to supplement”, to improve, and to support. Nutritional supplementation has not been designed to replace food intake and/or normal body physiology processes; it has been designed to enhance effects of macronutrients, or to add to their effect, if the health status, or a particular health condition require so.

In order to accomplish its goals, nutritional supplementation, in any form, needs to be mastered as in: *what* is it, what *forms* does it take, *how* it works, *effects* on the body in basic, *maintenance amounts*, what does it do for the body in *therapeutic dosages*, what does it *interact* with...and the list could go on.

It is our view that CAM practitioners need to be informed on all types of prescriptions and recommendations available to the public (medication, supplements, herbs, others), and understand the intricate relationship/interactions between the above mentioned.

DIETARY/NUTRITIONAL SUPPLEMENT: a product that contains substances like vitamins, minerals, foods, botanicals, amino acids and is intended to supplement the usual intake of these substances.

MAINTANANCE DOSE: the amount (of nutrients, herbs, etc) necessary to maintain the state of health or to maintain what has been achieved after a therapeutic protocol;

THERAPEUTIC DOSE: the amount (of nutrients, herbs, etc) necessary to achieve a therapeutic effect (a change in the initial status);

Forms of supplements administration

(For the following, the term 'substance' refers to any nutrient, herb, food component or other nutraceutical)

Tablets are a mixture of substance(s) and diluents, lubricants and stabilizers; the mixture is granulated and compressed into a tablet; the type and amount of additives and the degree of compression affect how quickly the tablet disintegrates and the substance is absorbed; a tablet can compress a substantial amount of the given substance, thus the daily dosage can be given in fewer doses; also, tablets have a longer shelf-life than other forms;

Capsules consist of substance(s) and additives within a gelatin shell that swells and releases its contents in the presence of humidity, eroding quickly. The size of the substance particles and the properties of the additives affect how quickly the substance(s) dissolves and is absorbed; generally, capsules have increased absorbability potential, but the daily dosage requires an increased number of capsules/day; shorter shelf-life than tablets;

Powder and liquid forms: substance(s) are either dried up and turned into powder or mixed with various liquid excipients in order to create a liquid form; great absorbability potential; short shelf-life; daily dosages requirements of substance(s) may result into increased number of dosages/day;

Recommendations:

- Cholesterol-level control: it seems that vitamin B3 helps decrease LDL levels and promotes increase of HDL levels;
- Protection of cardio-vascular system;
- May help Raynaud's disease and tinnitus cases, by exerting vasodilator effects;
- May have a role in treatment of depression, as niacin is very important for normal nervous system function;
- Arthritis; especially rheumatoid arthritis (due to niacinamide's anti-inflammatory properties);
- May protect against development of diabetic neuropathy and other complications;
- May play a role in Alzheimer disease prevention;

Forms:

- Niacin (nicotinic acid or nicotinate); generally useful for its blood lipid lowering properties);
- Niacinamide (nicotinamide); generally useful for arthritis and diabetes;
- Inositol hexaniacinate (does not create the characteristic B3 'skin flushing');

RDA: 6-12mg/day, in children, according to age; 19 mg/day for adult males; 15 mg/day for adult females;

Recommended dosages:

- For high cholesterol (hypercholesterolemia), Raynaud's disease, intermittent claudication* or tinnitus: 500 mg of inositol hexaniacinate three times a day;
- For anxiety or depression: 50-100mg niacin/day;
- For arthritis: 1,000 mg of niacinamide three times a day.

*Intermittent claudication is a symptom of arterial insufficiency, a form of vascular disease; predictable pattern of lower leg pain caused by inadequate blood flow to leg muscles; cramping pain in the calves brought on by exertion that is relieved by rest.

Facts and caution:

- Generally, niacin in the form of inositol hexaniacinate and niacinamide tends to cause fewer side effects than nicotinic acid;

Menorrhagia: heavy menstrual bleeding;

Metabolism: all chemical reactions in the body;

Metastasis: spread of cancer;

Metroorrhagia: inter-period uterine bleeding;

Microorganism: microscopic organism, such as viruses, bacteria, fungi, protozoa;

Micturition: urination;

Monocytes: type of white blood cells;

MOA: monoamine oxidase; enzyme catalysing breakdown of several biogenic amines, such as serotonin, adrenaline, noradrenaline, dopamine;

MOAI: monoamine oxidase inhibitors; group of antidepressant drugs that prevent the activity of the enzyme monoamine oxidase in the central nervous system thus affecting mood;

MS: multiple sclerosis;

MSK: musculo-skeletal;

MSM: sulfur compound (short for methylsulfonylmethane); MSM appears to inhibit pain impulses that travel along nerve fibers, acting as an analgesic; it also exhibits anti-inflammatory properties;

Mucolytic: mucus breaking;

MUFA: monounsaturated fatty acids;

MVP: Mitral valves prolapse;

Myocardium: the heart muscle;

Myometrium: the uterus muscle;

Myopia: nearsightedness;