

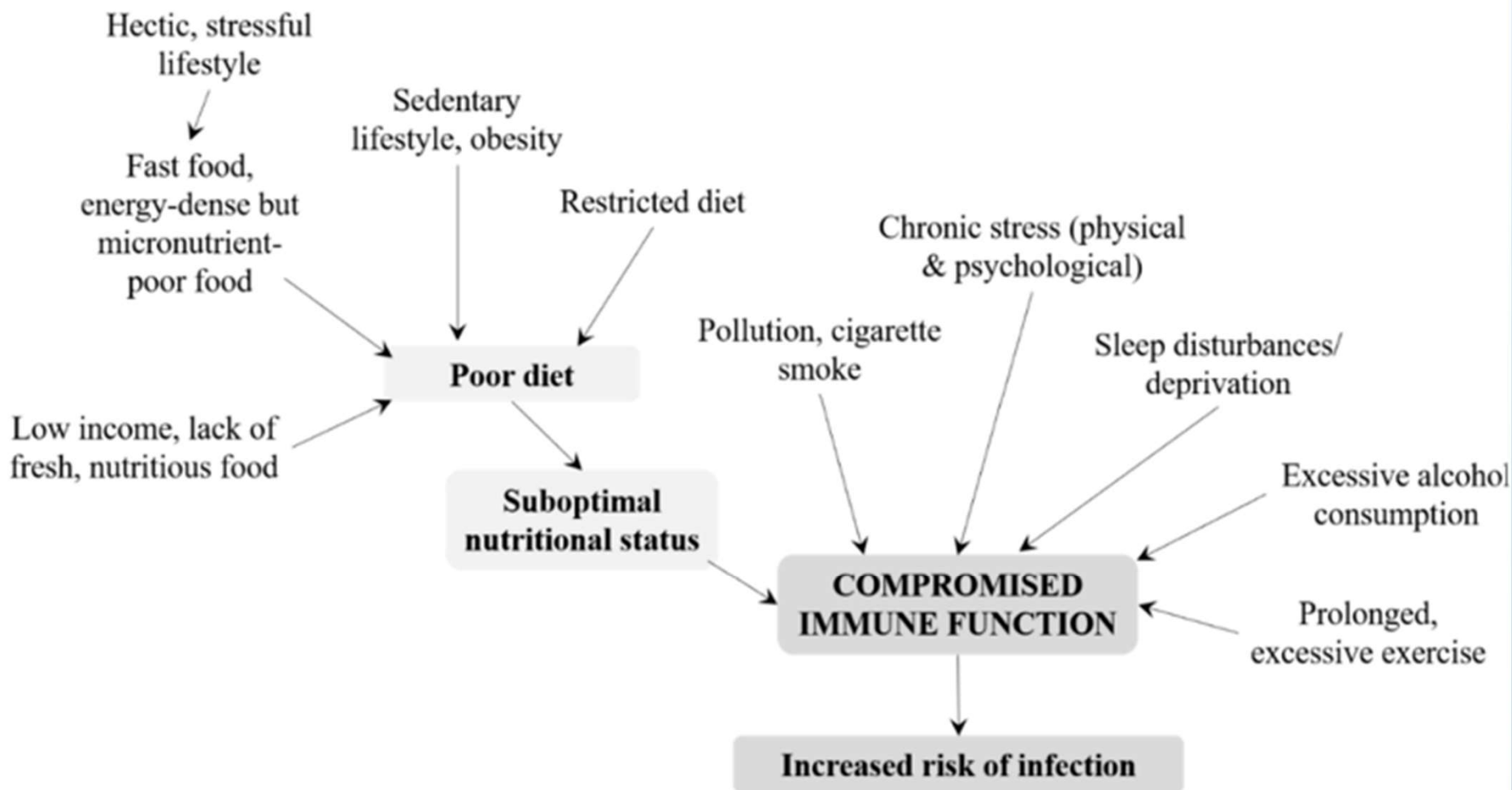
Immune Boosting Supplements

Dr. Yousef Jasebian

Ph.D., N.D., M.D. , PT, M.Sc. Health, L.Ac, M.Sc. BioMed. Eng.

Yjasebian@bastyr.edu

Yjasebian@nu.edu



Micronutrients

- Micronutrients include vitamins and minerals.
 - Don't provide energy,
 - Are essential for functions like digestion, hormone production, brain and nervous system function and immune function.
 - measured in either milligrams (mg), micrograms (mcg) or International Units (IU).

Antioxidants

- Vitamins A, C, E
- Coenzyme Q10,
- Manganese, iodide, melatonin,
- Alpha-carotene, beta-carotene,
- Astaxanthin, canthaxanthin, cryptoxanthin, zeaxanthin,
- Lutein, lycopene, polyphenols,
- Flavonoids, myricetin, isoflavone phytoestrogens, resveratrol, pterostilbene, ellagitannins,
- Chicoric acid, chlorogenic acid, cinnamic acid, ellagic acid, gallic acid, rosmarinic acid.
- Curcuminoids in turmeric and oleocanthal in extra virgin olive oil.

Essential Micronutrients for Immune System

- Vitamins: D, B2, B6, and B12, folic acid,
- Iron, selenium, zinc,
- Fatty acids- Essential & Nonessential
- Glutamine
- Antioxidants including vitamin A, C, E and Beta carotene, and more....

B vitamins

- Vitamin B1 (Thiamine)- improve immune system function
- Vitamin B2 (Riboflavin)- Riboflavin together with UV light cause irreversible damage to nucleic acids such as DNA and RNA of the rendering microbial/viral pathogens unable to replicate.
- Vitamin B3 (Nicotinamide, Niacin)- reduces viral replication.
- Vitamin B6 (Pyridoxal 5'-phosphate, Pyridoxine)- vitamin B6 (as well as B2 and B9) upregulate IL-10, a powerful anti-inflammatory and immunosuppressive cytokine which can deactivate macrophages and monocytes and inhibit antigen-presenting cells and T cells.
- Vitamin B9 (folic acid, folate)- essential vitamin for DNA and protein synthesis and in the adaptive immune response.
- Vitamin B12 (cobalamin)- Vitamin B12 is essential for red blood cell synthesis,
 - low levels of B12 elevate methylmalonic acid and homocysteine, resulting in increased inflammation, reactive oxygen species and oxidative stress.

Avoid:

1. food intolerances
2. trans-fatty acids, hydrogenated oils (margarine, vegetable shortening, imitation butter spreads, most commercial peanut butters, oxidized fats-deep fried foods, fast foods, ghee, BBQed meats)
3. refined, simple carbohydrates (sucrose, white flour, processed foods)
4. smoking, alcohol, stress, strong emotions and recreational drugs

Recommended Nutrition:

- diet consisting of: complex carbohydrates (70%)
- protein (12-15%)
- fat (15-18%)
- hypoallergenic/rotational diet
- vegetarian cleansing diet or short fast
- increase omega-3 and omega-6 fatty acids (vegetable, nuts, seed oils, salmon, herring, mackerel, sardines, flaxseed oil, evening primrose oil, black current oil), fiber, black beans, Ganoderma mushrooms, Chinese Black and Shiitake mushrooms
- add astragalus to meat broths and barley congee
- warming and easily digested, cooked foods
- foods such as: chicken, lamb, scallions, sesame seeds, fish, baked tofu, soybeans, walnuts, egg, lentils, black beans, lotus seeds ginger, cinnamon bark tea
- steamed vegetables, nourishing soups with tofu, soy sprouts, chrysanthemum flowers

Recommended Supplements:

1. high potency multivitamin and mineral with trace minerals
2. Beta carotene (300,000 IU qd)
3. Vitamin C (IV or buffered 10-60 gm qd)
4. Vitamin E (alpha-tocopherol) 15 mg qd
5. Selenium 400mcg qd
6. Zinc (30-50 mg qd)
7. Thymus extract
8. Essential fatty acids 300-600mg qd (omega-3 + omega-6)
9. Folic Acid 800 mcg qd
10. B-12 (Cyanocobalamin) 25 mcg qd,
11. B Complex Vitamin
12. Echinacea

Other recommended immune boosting supplements

All in one formula called Fruit Anthocyanins-
brand Natural Health (Dr. William Mitchell, ND)

- Elderberry
- Red Grape Seed Extract
- Blueberry
- Pomegranate
- Aronia berry
- Red Raspberry

<http://www.mitchellnaturalhealth.com/fruitanthocyanins.html>



Nutrilite™ Double X™ Multivitamin

S u p p l e m e n t F a c t s				
Serving Size: 1 Multivitamin tablet, 1 Multimineral tablet and 1 Phytonutrient tablet				
	Amount Per Serving	% DV* Per Serving	Amount Per Day (Two Servings)	% DV* Per Day
Vitamin A (as beta carotene and Vitamin A acetate) (74% as natural beta carotene)	1350 mcg	150%	2700 mcg	300%
Vitamin C (as ascorbic acid and Acerola concentrate [fruit])	100 mg	111%	200 mg	222%
Vitamin D (as Vitamin D3)	10 mcg	50%	20 mcg	100%
Vitamin E (as d-alpha tocopheryl acid succinate)	27 mg	180%	54 mg	360%
Thiamin (as thiamine mononitrate)	2.3 mg	192%	4.5 mg	375%
Riboflavin	2.6 mg	200%	5.1 mg	392%
Niacin (as niacinamide)	15 mg	94%	30 mg	188%
Vitamin B6 (as pyridoxine hydrochloride)	3 mg	176%	6 mg	353%
Folate	415 mcg DFE (250 mcg folic acid)	104%	830 mcg DFE (500 mcg folic acid)	208%
Vitamin B12 (as cyanocobalamin)	12 mcg	500%	24 mcg	1000%
Biotin	150 mcg	500%	300 mcg	1000%
Pantothenic Acid (as calcium d-pantothenate)	5 mg	100%	10 mg	200%
Calcium (as calcium carbonate)	250 mg	19%	500 mg	38%
Iron (as iron (II) fumarate)	2.5 mg	14%	5 mg	28%
Iodine (as potassium iodide and kelp (<i>Ascophyllum nodosum</i> [thallus], <i>Laminaria digitata</i> [thallus]))	75 mcg	50%	150 mcg	100%

Nutrilite™ Double X™ Multivitamin

Magnesium (as magnesium oxide)	100 mg	24%	200 mg	48%
Zinc (as zinc oxide)	7.5 mg	68%	15 mg	136%
Selenium (as sodium selenite)	35 mcg	64%	70 mcg	127%
Copper (as copper (II) gluconate)	0.5 mg	56%	1 mg	111%
Manganese (as manganese (II) sulfate)	1 mg	43%	2 mg	87%
Chromium (as chromium (III) chloride)	60 mcg	171%	120 mcg	343%
Molybdenum (as sodium molybdate (VI))	25 mcg	56%	50 mcg	111%
Lycopene (from tomato extract)(fruit)	0.5 mg	†	1 mg	†
Lutein Esters (from marigold extract)(<i>Tagetes erecta</i>)(flower)	1 mg	†	2 mg	†
Quercetin extract (<i>Dimorphandra mollis</i>)(seed)	50 mg	†	100 mg	†
Rosemary extract (<i>Rosmarinus officinalis</i>)(leaves)	83.5 mg	†	167 mg	†
Turmeric extract (<i>Curcuma longa</i>)(rhizome)	18.5 mg	†	37 mg	†
Citrus Bioflavonoid Complex (sweet orange, grapefruit, lemon, mandarin orange)(whole fruit and peel)	15 mg	†	30 mg	†
Berry blend (grape, black currant, elderberry, blueberry)(fruit)	20 mg	†	40 mg	†
AWPS Complex (alfalfa, watercress, parsley, spinach)(leaf, stem)	20 mg	†	40 mg	†
Peppermint extract (leaf)	10 mg	†	20 mg	†
Onion extract (bulb)	2.5 mg	†	5 mg	†
Mixed tocopherols concentrate	10 mg	†	20 mg	†

* Percent Daily Value based on a 2,000 calorie diet.

† Daily Value not established.

Holistic Primary Care's

Quality Counts

A Clinician's Guide to Supplement Quality

Fall | 2017



**U.S. FOOD & DRUG
ADMINISTRATION**



National Institutes of Health
Office of Dietary Supplements

DSHEA

- Dietary Supplement Health and Education Act of 1994
- Provides a regulatory framework for dietary supplements in the US
- “[a dietary supplement] is intended to supplement the diet that bears or contains one or more dietary ingredients, including a vitamin, a mineral, an herb or other botanical, an amino acid, a dietary substance for use by man to supplement the diet by increasing the total dietary intake, or a concentrate, metabolite, constituent, extract, or combination of any of the aforementioned ingredients”

GMP

- Good Manufacturing Practices
- Part of DSHEA but were not implemented until 2007
- Standards for purity, content, and identity of dietary supplements.

GMP

- GMPs outline detailed procedures for record keeping, quality control, operations, complaints and recalls, labeling, etc.
- FDA conducts site inspections to audit for GMP compliance and issues with record keeping. Violations are publicly available.
- Not a perfect system!
- FDA sometimes nit-picks high quality manufactures over minor details.
- Widespread violations in GMP standards continue to be a problem.
- Enforcement action is often lacking.

NDI

- New Dietary Ingredients
- Anything sold as a supplement not on the market before 1994.
- Must be submitted to the FDA for review of generally recognized as safe (GRAS)

United States Pharmacopeia (USP)

- A compendium of reference standards for drugs (both OTC and Rx), food ingredients, and dietary supplement ingredients.
- Published annually by the non-profit United States Pharmacopeial Convention.
- Enforcement is carried out by the FDA.
- The USP includes the Food Chemicals Codex, a compendium of standards for identity and purity of food ingredients.
- This includes nutrients (vitamins, minerals, amino acids, etc), food additives (flavors, colors, and sweeteners), and manufacturing products (binders, fillers, reagents, etc)

Delivery System

- Encapsulations:
- Form: tablet, capsule, softgels
- Capsule material: gelatin vs cellulose
- Coating: enteric coating, delayed/sustained release
- Fancy stuff: liposomes, micro-encapsulation, nanotechnology

Health Claims

- FDA approves two kinds of health claims on food products:
- Authorized health claims - The claim is supported by “significant scientific agreement” with regards to a disease/food relationship.
- Qualified health claims. - The claim is supported by more limited scientific evidence with regards to a disease/food relationship.

Quality Assurance

- Is the company a member of key industry organizations?
- Does the company have a robust Quality Assurance staff?
- Is the brand compliant with the basics of DSHEA?
- Do the labels show expiration dates or shelf life information?

In general be particularly wary of:

Weight loss, body-building, and male enhancement supplements
Supplements sold through multi-level marketing schemes

References:

- 1. Roy, Satyajeet, Anthony Sherman, MaryJoan Monari-Sparks, Olga Schweiker, and Krystal Hunter. 2014. "Correction Of Low Vitamin D Improves Fatigue: Effect Of Correction Of Low Vitamin D In Fatigue Study (Evidif Study)". North American Journal Of Medical Sciences 6 (8): 396. doi:10.4103/1947-2714.139291.
- 2. Park, Clara Yongjoo. 2019. "Vitamin D In The Prevention And Treatment Of Osteoarthritis: From Clinical Interventions To Cellular Evidence". Nutrients 11 (2): 243. doi:10.3390/nu11020243.
- 3. 2021. Apjcn.Nhri.Org.Tw. <http://apjcn.nhri.org.tw/server/APJCN/28/4/689.pdf>.
- 4. Amazon Flooded With Millions Of Fake Reviews In 2019 – Reviewmeta Blog ". 2019. Reviewmeta.Com. <https://reviewmeta.com/blog/amazon-flooded-with-millions-of-fake-reviews-in-2019/>.
- 5. Kaltenberg, Jennifer, Laura M. Plum, Julia L. Ober-Blöbaum, Andrea Hönscheid, Lothar Rink, and Hajo Haase. 2010. "Zinc Signals Promote IL-2-Dependent Proliferation Of T Cells". European Journal Of Immunology 40 (5): 1496-1503. doi:10.1002/eji.200939574.
- 6. Read, Scott A, Stephanie Obeid, Chantelle Ahlenstiel, and Golo Ahlenstiel. 2019. "The Role Of Zinc In Antiviral Immunity". Advances In Nutrition 10 (4): 696-710. doi:10.1093/advances/nmz013.
- 7. Wong, Carmen P., and Emily Ho. 2011. "Zinc And Its Role In Age-Related Inflammation And Immune Dysfunction". Molecular Nutrition & Food Research 56 (1): 77-87. doi:10.1002/mnfr.201100511.
- 8. "The Effect Of Curcumin On Serum Copper And Zinc And Zn/Cu Ratio In Individuals With Metabolic Syndrome: A Double-Blind Clinical Trial". 2021. Journal Of Dietary Supplements. <https://www.tandfonline.com/doi/abs/10.1080/19390211.2018.1472711>.
- 9. Newsholme, Philip. 2001. "Why Is L-Glutamine Metabolism Important To Cells Of The Immune System In Health, Postinjury, Surgery Or Infection?2". The Journal Of Nutrition 131 (9): 2515S-2522S. doi:10.1093/jn/131.9.2515s.

References:

- 10. Calder, P. C., and P. Yaqoob. 1999. "Glutamine And The Immune System". *Amino Acids* 17 (3): 227-241. doi:10.1007/bf01366922.
- 11. Cengiz, Mahir, Betül Borku Uysal, Hande İkitimur, Erkan Özcan, Mehmet Sami İslamoğlu, Emre Aktepe, Hakan Yavuzer, and Serap Yavuzer. 2020. "Effect Of Oral L-Glutamine Supplementation On Covid-19 Treatment". *Clinical Nutrition Experimental* 33: 24-31. doi:10.1016/j.yclnex.2020.07.003.
- 12. 2021. Rombio.Eu. <https://www.rombio.eu/rbl1vol16/17%20Badescu.pdf>.
- 13. Tiralongo, Evelin, Shirley Wee, and Rodney Lea. 2016. "Elderberry Supplementation Reduces Cold Duration And Symptoms In Air-Travellers: A Randomized, Double-Blind Placebo-Controlled Clinical Trial". *Nutrients* 8 (4): 182. doi:10.3390/nu8040182.
- 14. Krawitz, Christian, Mobarak Abu Mraheil, Michael Stein, Can İmirzalıoğlu, Eugen Domann, Stephan Pleschka, and Torsten Hain. 2011. "Inhibitory Activity Of A Standardized Elderberry Liquid Extract Against Clinically-Relevant Human Respiratory Bacterial Pathogens And Influenza A And B Viruses". *BMC Complementary And Alternative Medicine* 11 (1). doi:10.1186/1472-6882-11-16.
- 15. Torabian, Golnoosh, Peter Valtchev, Qayyum Adil, and Fariba Dehghani. 2019. "Anti-Influenza Activity Of Elderberry (*Sambucus Nigra*)". *Journal Of Functional Foods* 54: 353-360. doi:10.1016/j.jff.2019.01.031.
- 16. Shah, Sachin A, Stephen Sander, C Michael White, Mike Rinaldi, and Craig I Coleman. 2007. "Evaluation Of Echinacea For The Prevention And Treatment Of The Common Cold: A Meta-Analysis". *The Lancet Infectious Diseases* 7 (7): 473-480. doi:10.1016/s1473-3099(07)70160-3.
- 17. Aboueİlla, Amira M. K., Yasser E. Shahein, Sameh S. Tawfik, and Ahmed M. Zahran. 2007. "Phytotherapeutic Effects Of Echinacea Purpurea In Gamma-Irradiated Mice". *Journal Of Veterinary Science* 8 (4): 341. doi:10.4142/jvs.2007.8.4.341.
- 18. Grape seed extract: having a potential health benefits: *J Food Sci Technol*. 2020 Apr; 57(4): 1205–1215. Published online 2019 Sep 30. doi: 10.1007/s13197-019-04113-w- (PMCID: PMC7054588)- (PMID: 32180617)- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7054588/>.