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Professional Education Series

Support. Inform. Educate. Empower.

Discovering Stress-Relieving Foods and Herbs

TODAY'S AGENDA:

- Introduction & Housekeeping
- Speaker Introduction
- Presentation
- Q&A
- Closing

WEBINAR HOST:

Keith Hine, MS, RD
VP of Healthcare, Sports & Professional Education
Orgain, LLC

WEBINAR PRESENTER:

Vicki Retelny, RDN
Nationally recognized lifestyle nutrition expert, registered dietitian at FORM™, culinary/media consultant and author

Today's

Define stress and how it affects health

The connection between eating and stress

Identify herbs and foods that can help minimize stress

What is stress?

According to The American Institute of Stress…
stress is how we react to change. It's the non-specific reaction by the body to any demand placed on it.

**Since stress is such a subjective phenomenon that differs for each of us, there really is no satisfactory definition of stress that all scientists agree on. **

Common Stressors

Bad (*distress*)
Good (*eustress*)

- Family life
- Work
- Politics
- Climate change
- Traffic
- No control over fast-paced life demands

Americans are stressed!

➔ Americans are 20% more stressed than the global average.

➔ 55% of Americans are stressed during the day.

Stress in America Survey, 2022.

The Effects of Stress In The Body

Did you know? 60 to 90% of visits to doctors are related to stress.

Chronic stress can wreak havoc on your total body health causing a myriad of physical, psychological and biochemical responses:

- Chronic inflammation
- Atherosclerosis/Cardiovascular disease
- Neurodegenerative impairment
- Depression
- Metabolic disorders and weight gain
- Cancers
- Premature aging
- Sexual dysfunction/reduced libido

Panossian A. Understanding adaptogenic activity: specificity of the pharmacological action of adaptogens and other phytochemicals. *Ann N Y Acad Sci*. 2017;1401(1):49-64. doi:10.1111/nyas.13399

Adapting to Stress Is Vital

Everyone deals with stress in life and has the ability to adapt, but it's how you adapt that counts!

Adaptation, an essential feature of all biological systems, is critical to survival. We all handle stress differently based on our genetic make-up.

Yance DR. Adaptogens in medical herbalism: elite herbs and natural compounds for mastering stress, aging, and chronic disease. New York: Simon and Schuster; 2013. pp. 103–107.

The Stress Response

- **Alarm Phase:** in response to stress, hormones cortisol and adrenaline are released. This phase is critical to survival.
- **Resistance Phase**:adaptive changes take place as the body deals with the stressor(s).
- **Exhaustion Phase**: prolonged exposure to the stress causes depletion of hormones, exhaustion and illness.

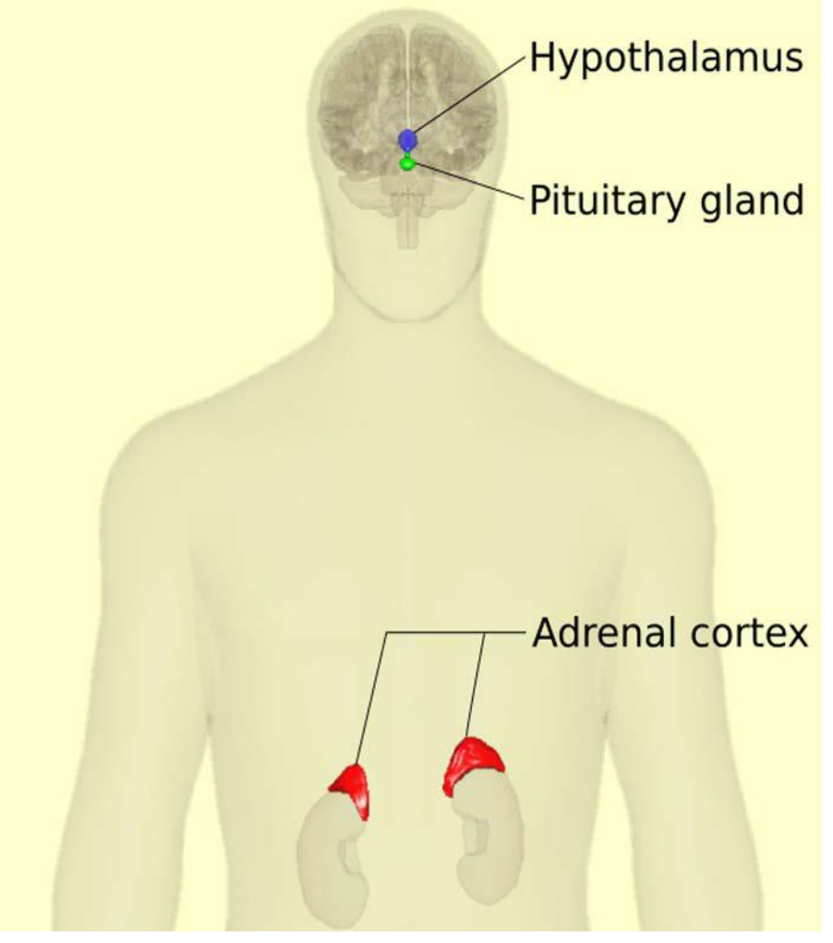
Source: Selye, H. Stress; Acta Medical Publisher: Montreal, Canada, 1950.

The HPA-Axis

The Hypothalamus Pituitary Adrenal Axis regulates many systems in the body:

➔Metabolic system
➔Cardiovascular system
➔Immune System
➔Reproductive System
➔Central Nervous System

HPA Axis is essential for adapting effectively to stress!



Source: *Wikimedia Commons*. Retrieved 17:44, August 6, 2023 from https://commons.wikimedia.org/w/index.php?title=File:HPA-axis_-_anterior_view_(with_text).svg&oldid=457039682.

The Stress Response in the HPA-Axis

Exposure to a stressor (being chased by a lion)

↓

Sympathetic nervous system releases epinephrine (adrenaline)/norepinephrine (noradrenaline)

↓

Hypothalamus secretes corticotrophin-releasing hormone (CRH)

↓

Pituitary gland to release ACTH (adenocorticotropic hormone)

↓

ACTH travels to the **adrenal glands** which causes them to release cortisol

Stress & Eating

Why do we eat more refined carbs when stressed?

One theory:

↑ cortisol = slows down metabolism (to take care of the immediate stressor)

↑ blood pressure and insulin production causing ↓ blood sugar

↑cravings for sugary, high carb foods

Born JM, Lemmens SGT, Rutters F, et al. Acute stress and food-related reward activation in the brain during food choice during eating in the absence of hunger. *Int J Obes* 2010; **34**: 172-181.

The Brain and Stress

Did you know the brain is just 2% of our body weight, but uses 50% the body's carbohydrate (glucose) requirements when stressed?

Under acute stress the brain requires about **12 percent more energy (aka glucose!)**, which leads to cravings for refined, high sugar carbohydrates.

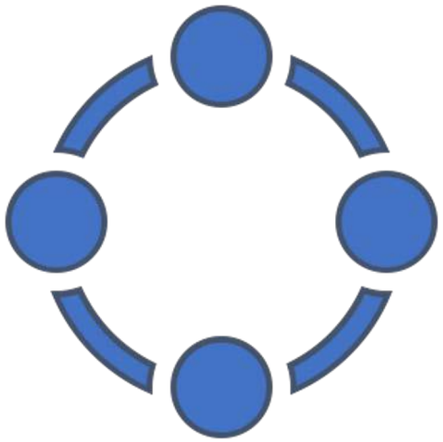
Being stressed = cravings for comfort, high CHO foods.

https://www.mdpi.com/2072-6643/15/1/209
https://www.scientificamerican.com/article/why-do-we-crave-sweets-when-were-stressed/#:~:text=Under%20acute%20stress%20the%20brain,performed%20poorly%20prior%20to%20eating.

What are adaptogens?

Adaptogens are:

substances that enhance the “state of non-specific resistance” in stress, a physiological condition that is linked with various disorders of the neuroendocrine-immune system.



Adaptogens must be:

- Non-toxic at normal doses.
- Support the entire body’s ability to copy with stress.
- Help the body return to a stable state.

Panossian, A.; Wikman, G. Effects of Adaptogens on the Central Nervous System and the Molecular Mechanisms Associated with Their Stress—Protective Activity. *Pharmaceuticals* **2010**, *3*, 188-224.
https://www.UCLAHealth.org/what-are-adaptogens_and-should-you-be-taking-them

“In stressful situations, adaptogens help keep the traffic lights of the neuroendocrine systems working properly”.

- Donald R. Yance, author of *Adaptogens in Medical Herbalism*

Mechanism of Action of Adaptogens

➔How they work is still a mystery.

➔They have non-specific action.

➔They interact with more than one stress receptor at a time (called “network pharmacology”).

➔100 + phytochemicals in plant foods and herbs = several targets and mechanisms of action.

➔They have synergistic properties.

Panossian, A. Wikman G. Effects of Adaptogens on the Central Nervous System and the Molecular Mechanisms Associated with Their Stress-Protective Activity. Pharmaceuticals 2010,3,188-224.

Yance DR. Adaptogens in medical herbalism: elite herbs and natural compounds for mastering stress, aging, and chronic disease. New York: Simon and Schuster; 2013. pp. 103–107.

3 Types of Adaptogens

➔**Primary -** backed by abundant scientific research to confirm their adaptogenic characteristics. Exert influence on the HPA-axis.

➔**Secondary -** not the level of scientific research behind them; supportive role. Exert influence on the immune, nervous and endocrine systems, but not HPA-axis (i.e., fatty acids, sterols and phenols).

➔**Companions -** shown to act synergistically with other adaptogens and support their function (i.e., green tea, vitamin C, CoQ10).

Stress-Reducing Herbs

- There are over 70 different plants cited in the literature with adaptogenic properties.

- Used alone or in combination in herbal teas, smoothies, plant-based protein powders, bottled juices and in supplements.

Here are some common adaptogens . . .

Common Adaptogens

- Ashwagandha (*Withania somnifera*) - primary
- Holy Basil (*Tulsi*) - primary
- Turmeric (*Curcuma longa*) - secondary
- Ginseng (*Panax ginseng or quinquefolius*) - primary
- Rhodiola (*Rhodiola rosea*) - primary
- Schisandra chinensis - primary
- Eleutherococcus senticosus - primary
- Reishi mushrooms - primary
- Green tea - companion

Panossian, A.; Wikman, G. Effects of Adaptogens on the Central Nervous System and the Molecular Mechanisms Associated with Their Stress—Protective Activity. Pharmaceuticals 2010, 3, 188-224.

Ashwagandha Up Close

What is ashwagandha?

It’s a small shrub used in Ayurvedic medicine that has been shown to help reduce anxiety and stress in several human studies.

Forms: whole herb tea, liquid tincture, powder, dietary supplement

Cons of studies: small sample sizes and short durations, different extracts and varying doses.

Ashwagandha Research

- RCT (2019) – 60 mildly stressed adults took 240 mg of ashwagandha extract or a placebo for 60 days. Outcomes were measured on various validated stress scales, as well cortisol fluctuations.
- Results: significant reductions on stress scales, as well as reductions in cortisol levels compared to the placebo.

Lopresti AL, Smith SJ, Malvi H, Kodgule R. An investigation into the stress-relieving and pharmacological actions of an ashwagandha (Withania somnifera) extract: A randomized, double-blind, placebo-controlled study. Medicine (Baltimore). 2019 Sep;98(37):e17186.

Ashwagandha Research

Phytotherapy Research / Volume 36, Issue 11
/ p. 4115-4124

REVIEW

Does Ashwagandha supplementation have a beneficial effect on the management of anxiety and stress? A systematic review and meta-analysis of randomized controlled trials

- Meta-analysis (2022) of 12 research papers w/ RCTs
- 1,002 participants
- Ages 25 - 48 years
- Results: 300-600 mg/day ashwagandha supplementation showed a favorable effect on stress compared to a placebo.
- Further high quality studies are needed.

Ashwagandha Daily Dosage

How much Ashwagandha should you take?

Root powder: 1 to 6 grams (1,000 - 6,000 mg) a day

Extracts: 500 mg - 1,500 mg a day

A daily dose should provide at least 6 mg of withanolides - typically between 10 mg and 30 mg have been useds in most studies.

https://www.consumerlab.com/reviews/ashwagandha-supplements/ashwagandha/?search=Ashwagandha#toppick

Ginseng Up Close

What is ginseng?

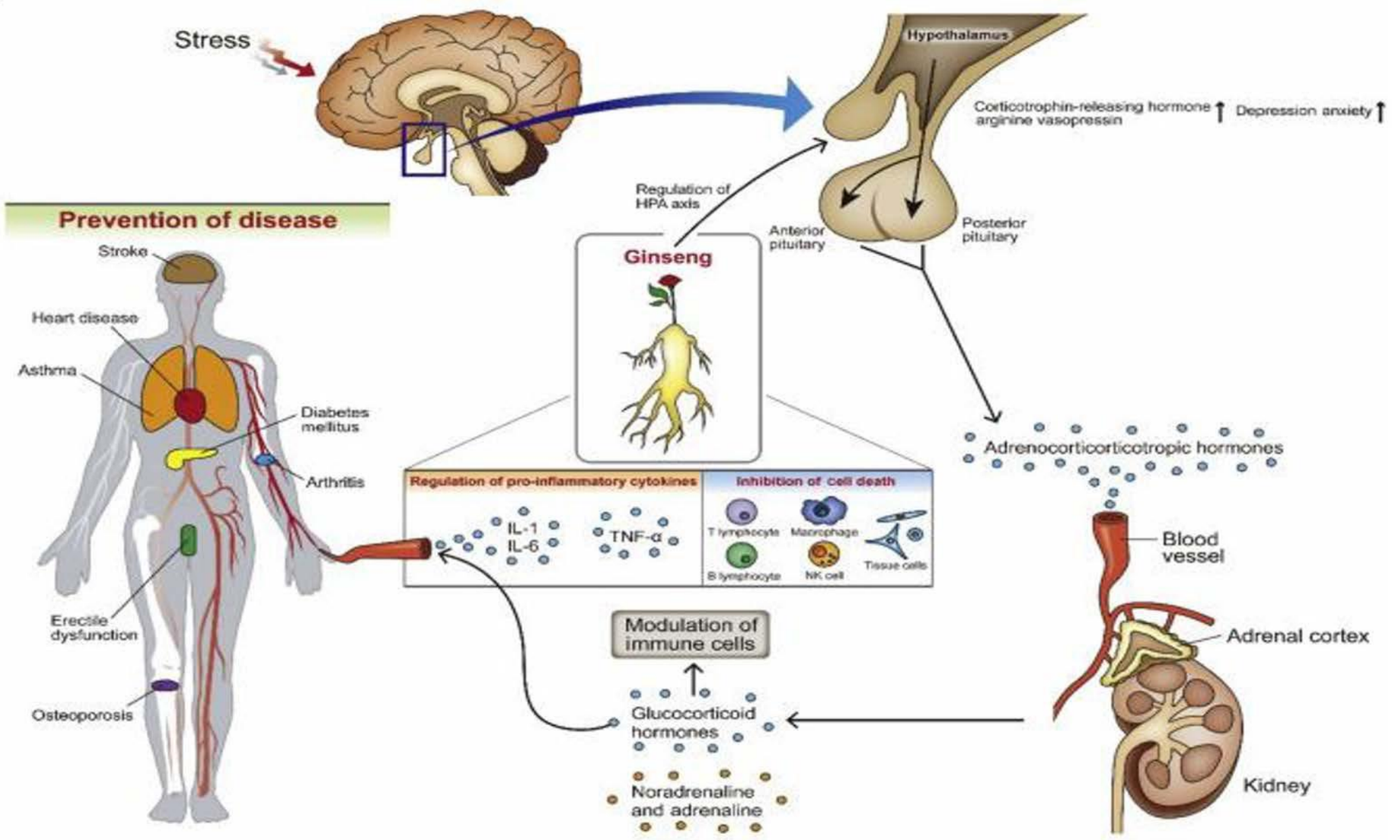
It’s a short plant with fleshy roots that has been used in Chinese medicine for centuries. It can help reduce oxidative stress and inflammation in some human studies.

Forms: raw or as a tea, powder, capsule or oil.

Ginseng’s active chemicals: **ginsenosides.**

Cons of studies: small sample sizes and short durations, use different extracts, types and varying doses.

Ginseng and The HPA-Axis



Ginseng Daily Dosage

Daily doses vary, however for healthy adu

1 to 2 grame raw ginseng root

200 - 400 mg extract (2 - 3 % total gensenosides)

**As with all herbal remedies, start small and increase slowly. Consuming before a meal may help increase absorption.*

https://www.healthline.com/nutrition/ginseng-benefits

Green Tea

- Greens teas like white, oolong, green and black tea all come from the *Camellia sinensis* plant.

- Contains L-theanine, which has a calming effect on the central nervous system.

- In a review of 5 RCTs, 200 - 400 mg/day; up to 8 weeks in 104 participants indicated reduced st and anxiety in those taking L-theanine supplements.

Everett, JM, et al. Theanine consumption, stress and anxiety in human clinical trials: A systematic review. J Nutr Intermed Met, Vol 4. June 2016, p. 41 - 42.

The Pros of Adaptogenic Herbs and Mushrooms

- ➔ Adaptogens are receiving more scientific attention as a promising adjunctive therapy for stress.
- ➔ In the last five years, there are 97 published studies on PubMed!
- ➔ Different herbs and fungi do different things and they don’t only target a single receptor. They work synergistically!
- ➔ Adaptogens can help balance the neuroendocrine system through enhancements of the cellular energy systems and HPA-axis.

The Cons of Adaptogenic Herbs & Mushrooms

Check for third party verification seals on supplement labels:

- United States Pharmacopeia (USP)
- Underwriters Limited (UL)
- The National Sanitation Foundation (NSF)
- Consumer Lab (CL)
- International Fish Oil Standards (IFOS)

Look for allergens and expiration dates, too!

➔ Herbs can interfere with certain medications and dosages are not standardized.

➔ Understand the contraindications for individual health conditions.

➔ Pregnant and breastfeeding women should avoid them due to potential effects on hormone levels, etc.

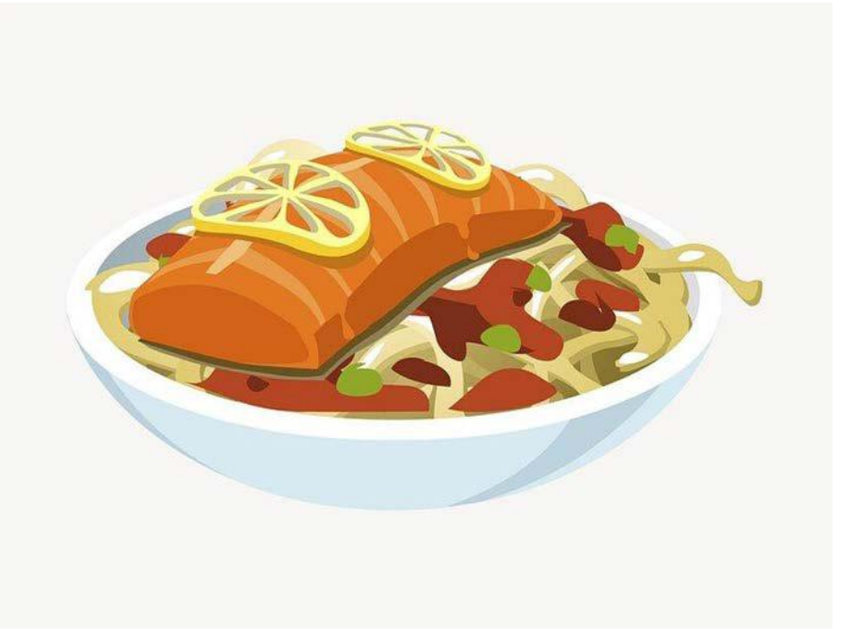
➔ More robust research is needed as far as evidence-based, human clinical trials using standardized herbal preparations.

➔ Herbal supplements are not regulated by FDA and some may contain less herbs and more contaminants.

How to eat to engage the parasympathetic nervous system ("rest and digest")

Eat the Mediterranean Way!

Plant foods + fish + moderate alcohol (red wine)



➔The synergy of bioactive compounds, such as polyphenols, MUFAs and PUFAs, and fiber helps fend off inflammation in the body can help lower cortisol levels and cause relaxation.

➔Inflammation *and* oxidative stress are interrelated: oxidative stress can activate inflammatory signaling pathways, while inflammation induces oxidative stress.

B J Pharmacol, 2020 Mar;177(6):1241-1257 doi: 10.1111/bph.14778

Calm-The-Body Nutrition Recommendations

➔**Color your plate** = whole vegetables, fruits, pulses (beans, peas, lentils)

➔**Fill up on fiber** = vegetables, fruits, whole grains, pulses

➔**Unsaturated fats** = avocado, olive oil, nuts (MUFAs), walnuts, seeds, fish (PUFAs)

➔**High quality, lean proteins** = less red, processed meats and include poultry, tofu, tempeh and eggs

➔**Limit added sugars and sodium** = use fruit to sweeten foods; herbs and spices to flavor with less sodium

-leafy greens

-vegetables

-nuts

-seeds

-fish

-carrots

-sweet potatoes

-avocado

-cauliflower

-tahini

-parsley

-soy

-whole grains

-lentils

-dark chocolate

Magnesium-Rich Foods

50% of Americans are deficient in magnesium. Stress and magnesium are interrelated.

Stress ↑ Mg loss causing a deficiency.

Mg deficiency↑stress.

RDA: 320 - 420 mg daily a day for adults; pregnancy: 350-360 mg daily lactation: 310-320 mg daily.

Upper limit 350 mg from supplements only. (High doses can lead to diarrhea, nausea and cramping.) Extra Mg from food is safe because the kidneys will eliminate excess amounts in the urine.

Pickering G, Mazur A, Trousselard M, Bienkowski P, Yaltsewa N, Amessou M, Noah L, Pouteau E. Magnesium Status and Stress: The Vicious Circle Concept Revisited. Nutrients. 2020 Nov 28;12(12):3672.

Workinger JL, Doyle RP, Bortz J. Challenges in the Diagnosis of Magnesium Status. Nutrients. 2018 Sep 1;10(9):1202. doi: 10.3390/nu10091202. PMID: 30200431; PMCID: PMC6163803.

https://www.hsph.harvard.edu/nutritionsource/magnesium/

NUTS

Tree nuts and peanuts have been shown to help mediate the stress response.

Recommendation: An ounce of nuts a day (1/4 cup).

- ➔ High in MUFAs.
- ➔ Antioxidants: vitamin E and phenolic compounds have been shown to decrease oxidative stress by reducing the effects of ROS and decreasing biomarkers for CVD.
- ➔ Phytochemicals present in nuts have bioactive properties, such as antioxidant, antiproliferative, **anti-inflammatory**, antiviral, and hypocholesterolemic properties.

Lorenzon dos Santos J, Schaan de Quadros A, Weschenfelder C, Bueno Garofallo S, Marcadenti A. Oxidative Stress Biomarkers, Nut-Related Antioxidants, and Cardiovascular Disease. *Nutrients*. 2020; 12(3):682. https://doi.org/10.3390/nu12030682

Bolling, B.W.; McKay, D.L.; Blumberg, J.B. The phytochemical composition and antioxidant actions of tree nuts. *Asia Pac. J. Clin. Nutr.* **2010**, *19*, 117–123.

OMEGA-3 FATS

Omega- 3 fats (EPA + DHA)

Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have been shown to help fend off stress-related diseases and disorders:

- ➔ CVD
- ➔ Depression
- ➔ Certain cancers (i.e., prostate)

Why? These essential fatty acids have antioxidant and anti-inflammatory properties to help reduce oxidative stress and inflammation. Plus, research has shown that omega-3 fats may help reduce **cortisol** in the body.

How much daily? 8 – 12 ounces per week of low-mercury fish.

What the science says:

Heart Health: A 2021 meta-analysis of 40 clinical trials: 1 g/day EPA + DHA = 9% and 7% lower risk of myocardial infarction and total coronary heart disease, respectively, and to a 5.8% lower risk of CVD events.

Depression: International Society for Nutritional Psychiatry Research recommends 1 to 2 g/day of EPA + DHA.

Bernasconi A.A., Wiest M.M., Lavie C.J., Milani R.V., Laukkanen J.A. Effect of omega-3 dosage on cardiovascular outcomes: An updated meta-analysis and meta-regression of interventional trials. *Proc. Mayo Clin.* 2021;96:304–313.

How much omega-3 in seafood?

Seafood, cooked	DHA	EPA
Salmon, Atlantic, farmed, 3 oz.	1.24	0.59
Salmon, Atlantic, wild, 3 oz.	1.22	0.35
Herring, Atlantic, 3 oz.	0.94	0.77
Sardines, canned, 3 oz.	0.74	0.45
Mackerel, Atlantic, 3 oz.	0.59	0.43
Trout, wild, 3 oz.	0.44	0.40
Oysters, 3 oz.	0.23	0.30
Seabass, 3 oz.	0.47	0.18
Shrimp, 3 oz.	0.12	0.12

https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/

Fiber

Dietary fiber can reduce stress and inflammation in the body!

Fiber is a shortfall nutrient with only 5% of Americans eating enough fiber daily!

The non-digestible parts of plant foods:

- Fends off chronic diseases (T2D, CVD, Cancers)
- Stabilizes blood sugar; improves insulin sensitivity
- Fills you up faster and longer helping with weight loss and weight management.
- Maintains a diverse gut microbiome = better immune function (with higher levels SCFAs and lower pH)
- **Reduces inflammation** (studies have shown higher CRP in people who ate less fiber).

Bo S, Durazzo, M, Guidi S, et al. . Dietary magnesium and fiber intakes and inflammatory and metabolic indicators in middle-aged subjects from a population-based cohort. *Am J Clin Nutr.* 2006;84:1062–1069.

Quagliani D, Felt-Gunderson P. Closing America's Fiber Intake Gap: Communication Strategies From a Food and Fiber Summit. Am J Lifestyle Med. 2016 Jul 7;11(1):80-85. doi: 10.1177/1559827615588079. PMID: 30202317; PMCID: PMC6124841.

Fiber

Research show that high fiber diets (more plant foods!) are linked to healthy anti-inflammatory lifestyle behaviors that reduce stress!

more physical activity
less smoking
less alcohol use
less depression
lower body weight and less visceral adiposity

Dietary Guidelines for Americans 2020-2025 recommend 14 grams of fiber per 1,000 calories.

Johansson L, Thelle, DS, Solvoll K, et al. . Healthy dietary habits in relation to social determinants and lifestyle factors *Br J Nutr.* 1999;81 211–220.

Olivia G Swann and others, Dietary fiber and its associations with depression and inflammation, *Nutrition Reviews*, Volume 78, Issue 5, May 2020, Pages 394–411, https://doi.org/10.1093/nutrit/nuz072
.

Tryptophan-rich foods

Tryptophan has a calming effect through interactions with the gut-brain axis. It's a precursor to serotonin, the feel good neurotransmitter in the brain.

- ➔ seafood
- ➔ eggs
- ➔ poultry
- ➔ peanuts and peanut butter
- ➔ pumpkin and sesame seeds
- ➔ milk
- ➔ kiwi
- ➔ plums
- ➔ tomatoes
- ➔ pineapple
- ➔ bananas

RDA: 250 - 425 mg per day

Probiotics

➔ The **gut-brain connection** can help with the management of stress. Studies have found that psychosocial stress can modify intestinal flora through certain bioactive factors.

➔ Probiotics are also known as “psychobiotics” because of their positive effects in emotion, cognition, and other psychological processes.

➔ Studies found that under stress conditions, probiotics can play a beneficial role by regulating the synthesis and release of a variety of neurotransmitters and bioactive factors, including cortisol.

Takada, M., Nishida, K., Kataoka-Kato, A., Gondo, Y., Ishikawa, H., Suda, K., … Rokutan, K.(2016). Probiotic *Lactobacillus casei* strain Shirota relieves stress-associated symptoms by modulating the gut-brain interaction in human and animal models. *Neurogastroenterology and Motility*, **28**(7), 1027–1036. https://doi.org/10.1111/nmo.12804

Probiotics

Fermented Foods May Help Reduce Stress

Yogurt
Sauerkraut
Kimchi
Black mushrooms
Kefir
Apple Cider Vinegar

How many colony forming units (CFUs) do you need?

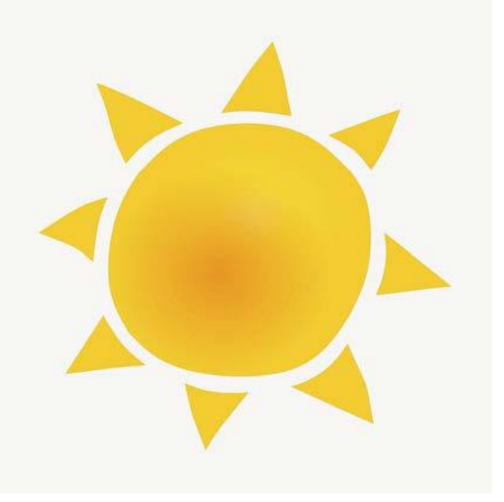
It depends, but the minimum effective amount is one billion CFU, according to the International Scientific Association of Probiotics and Prebiotics.

Hill C et al. Nat Rev Gastroenterol Hepatol. 2014. 11(8): p.506-14.

Takada, M., Nishida, K., Kataoka-Kato, A., Gondo, Y., Ishikawa, H., Suda, K., … Rokutan, K.(2016). Probiotic *Lactobacillus casei* strain Shirota relieves stress-associated symptoms by modulating the gut-brain interaction in human and animal models. *Neurogastroenterology and Motility*, **28**(7), 1027–1036. https://doi.org/10.1111/nmo.12804

Get the Sunshine Vitamin: D!

Chronically high cortisol can interfere with the absorption of vitamin D and other nutrients.



Healthy adults should aim for at least 600 IU daily.

Foods high in vitamin D:

- ➔ Egg yolks
- ➔ Fatty fish
- ➔ Fortified milk and yogurt
- ➔ Mushrooms (exposed to UVB light)

And the big ONE: Sunlight! Aim for 10 – 15 minutes at least twice a week without sunscreen.

***Supplementation may be necessary for suboptimal vitamin D levels.**

Dehydration and Stress

Stress can cause dehydration *and* dehydration can cause stress!

Hydration guidelines: Half for your body weight in ounces should come from fluids, primarily water.

Stress-Relieving Water Habits

- ➢ Sip water throughout the day.
- ➢ Drink water at work, carpool pickup and dropoff or during class.
- ➢ Eat high water foods, such as fruits and vegetables, soups and smoothies.

Armstrong LE, Muñoz CX, Armstrong EM. Distinguishing low and high water consumers—a paradigm of disease risk. *Nutrients*. 2020;12(3):858. doi:10.3390/nu12030858)

To reduce stress, encourage your patients to try…

Mindful-Based Stress Reduction (MBSR) Techniques

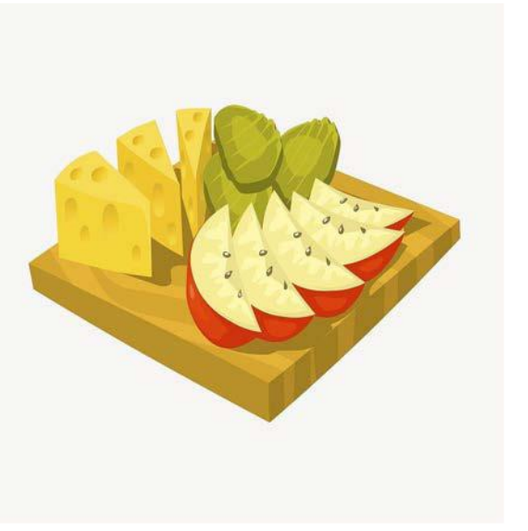
Evidence has shown that MBSR and mindful-based eating awareness training can fosters a new and sustainable relationship between food and eating.

Two main parts: Attention + Acceptance

➔ meditation
➔ yoga
➔ Pilates
➔ mindful eating
➔ breath work
➔ tai chi
➔ repetitive prayer

Tapper, K. Mindful Eating: What We Know So Far. Nutr Bull. 2022 Jun;47(2):168-185.

Resources



The American Institute of Stress https://stress.org

The Journal of the American Botanical Council (HerbalGram)

The Journal of Complementary and Alternative Medicine

National Center for Complementary and Integrative Health https://nccih.nih.gov

Memorial Sloan Kettering Cancer Center https://aboutherbs.com

Any questions or comments?

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