

# Stress & Supplements

## *HPA Axis Dysfunction & Adaptogens*

**Health is the ability to adapt  
to one's environment.**  
–George Canguilhem,  
*Normal and Pathological* (1943)

Melinda Ring, MD, FACP,  
Dipl.ABOIM, IFMCP, Dipl.ACLM  
Director, Osher Center for Integrative Health  
at Northwestern University  
[www.drmelindaring.com](http://www.drmelindaring.com)



# Agenda

-  **Stress Unraveled: A Deep Dive into HPA Axis Dysfunction**
-  **Natural Warriors: How Adaptogens Battle Stress**
-  **Harnessing Adaptogens: Safe and Effective Strategies**

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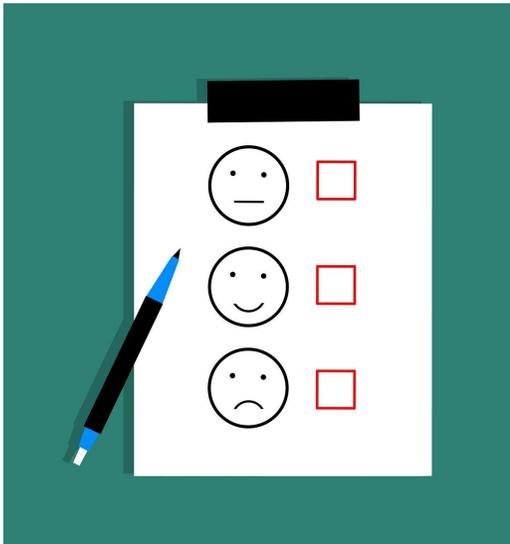
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# American Psychological Association Survey 12/22

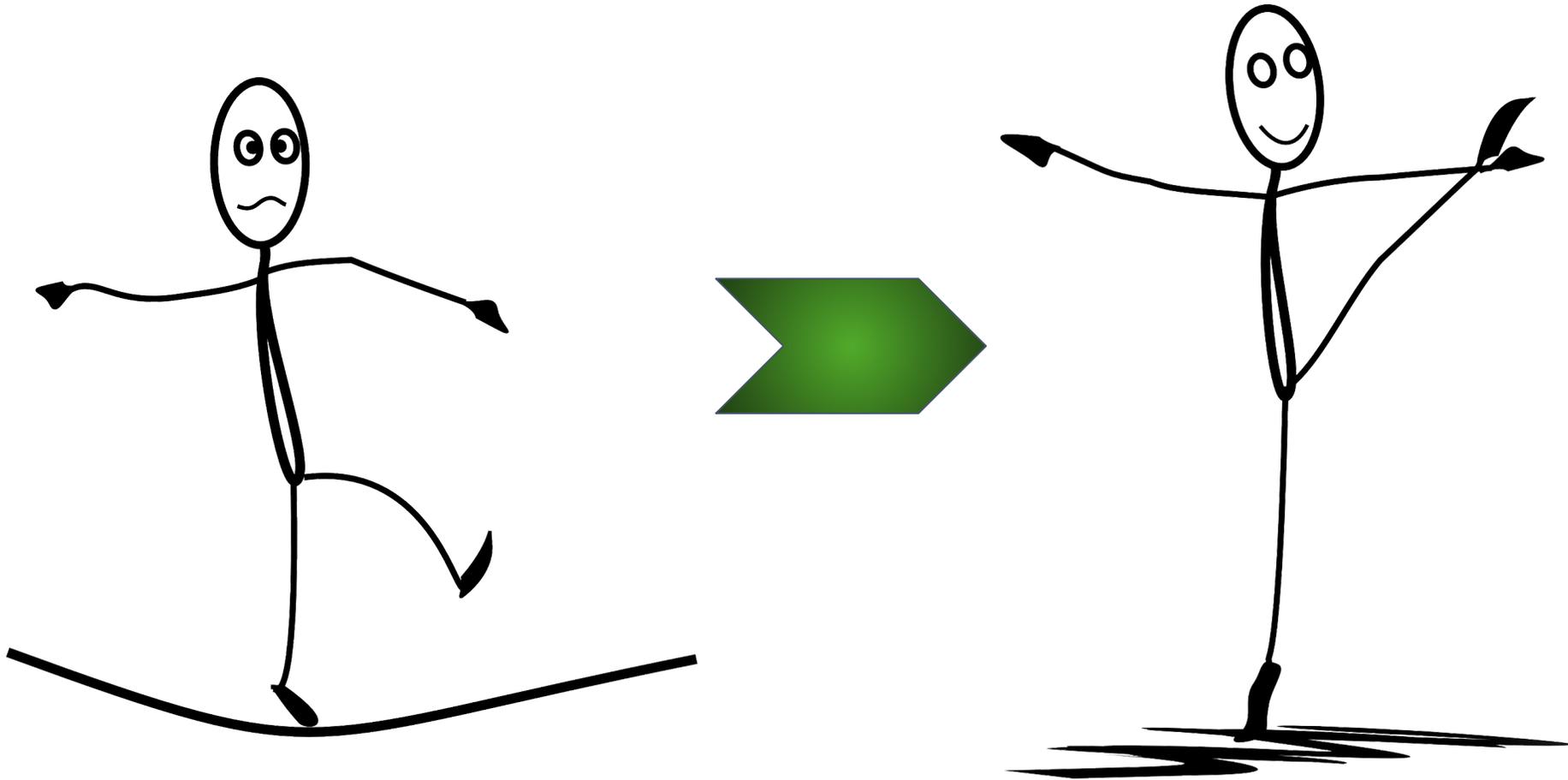
- **37%** rated their mental health as only fair or poor, (up from 31%)
- **26%** anticipated experiencing more stress in 2023 (up from 20%)

## Somewhat or very anxious about:

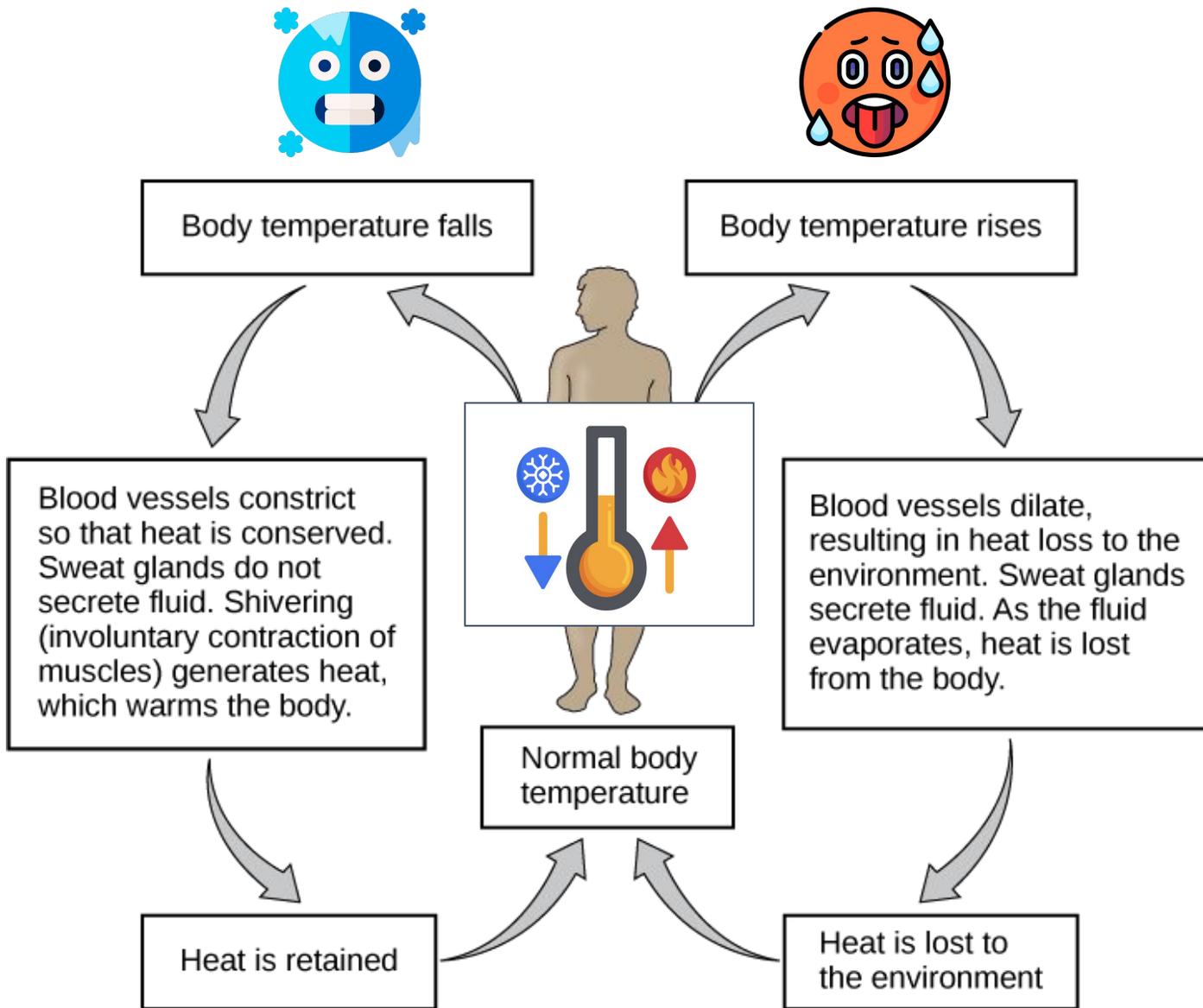
- **Personal finances** (64%, up from 58%).
- **The uncertainty of 2023** (55% versus 54% last year).
- **Their physical health** (49%, up from 44% last year).
- **Their mental health** (41%, up from 37%).
- **Relationships with friends and family** (31%, up from 28%).
- **Romantic relationships** (26% versus 25%).
- **Job security** (27% in both years).
- **Keeping their New Year's resolution** (24% both years).
- **Traveling** (21%, down from 29%).



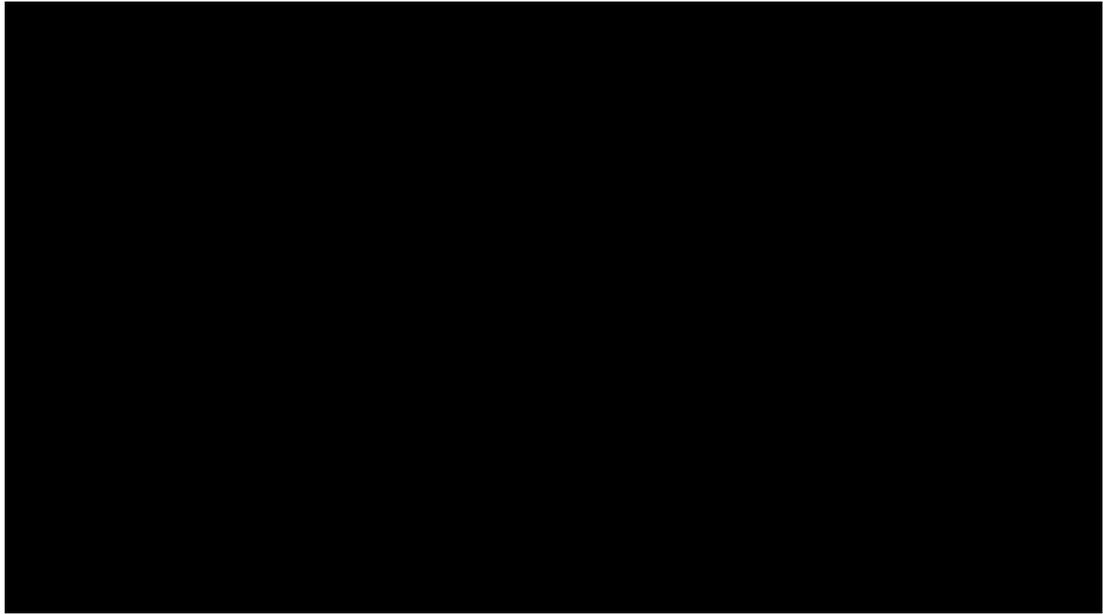
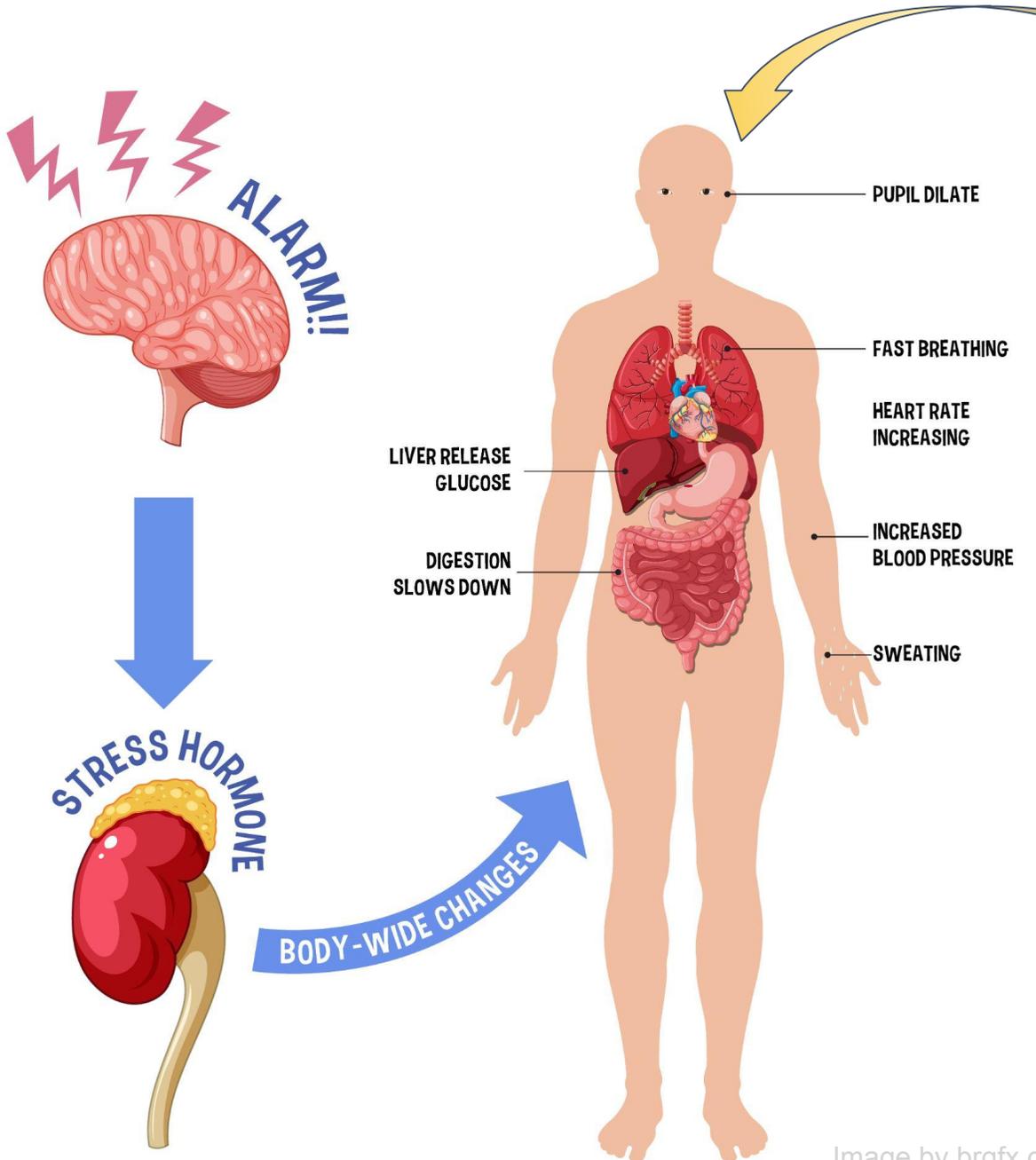
# Homeostasis



# Homeostasis



# Stress Response



# “A Syndrome Produced by Diverse Nocuous Agents,” by Hans Selye.

*Nature* (vol. 138,  
July 4, 1936, p. 32)

(1) If tissue cells are brought from their liquid culture medium, after several washings, into a medium free from electrolytes, then within a few seconds the following phenomena, consisting of three main effects, take place: (a) an assumption of globular form by the cells; (b) the appearance of a vivid Brownian movement of the granules and vacuoles in the cytoplasm, as a sign of a maximal reduction of the viscosity in consequence of a discharge with simultaneous increasing absorption of water; (c) a process of slow coagulation in the cytoplasm, which manifests itself in the appearance of new particles in vivid Brownian movement, which continuously increase in size. The gradual multiplication and increase of the particles is best seen with dark field illumination, but the vivid Brownian movement is also well seen with direct illumination.

(2) In some of the cells which have become globular, there occurs a bursting of the cell, with extrusion of liquid contents containing particles in Brownian movement (analogous to hypotonic hemolysis with extrusion of haemoglobin). Sometimes the torn parts adhere together again after diminution of the interior pressure.

(3) The presence of non-electrolytes in the medium ( $n/36-n/12$  dextrose;  $n/5-n/1$  urea) does not hinder the appearance of the phenomena described, but naturally reduces the activity of the Brownian movement in the cytoplasm.

(4) The phenomena described are reversible. The reversal can be produced after several minutes by means of Ringer solution,  $n/10$  sodium chloride, or  $n/10$  sodium bromide. The cells regain their former shape extremely quickly, with immediate stoppage of the Brownian movement in the cytoplasm. The cells then show normal vital staining.

(5) The phenomena can only be produced with living and not with dead cells. Failure is a sure sign of cell death.

The results of these experiments prove the justness of the above assumptions. Furthermore, they show that hypotonic hemolysis is only a special case of a general phenomenon in tissue cells. They reveal, furthermore, a fundamental property of tissue cells in which the salt ions of the tissue liquid participate decisively in the maintenance of the particle charge of the protoplasm.

H. GROSSFELD.

Anatomical Institute,  
Turin.

## A Syndrome produced by Diverse Nocuous Agents

EXPERIMENTS on rats show that if the organism is severely damaged by acute non-specific nocuous agents such as exposure to cold, surgical injury, production of spinal shock (transsection of the cord), excessive muscular exercise, or intoxications with sublethal doses of diverse drugs (adrenaline, atropine, morphine, formaldehyde, etc.), a typical syndrome appears, the symptoms of which are independent of the nature of the damaging agent or the pharmacological type of the drug employed, and represent rather a response to damage as such.

This syndrome develops in three stages: during the first stage, 6-48 hours after the initial injury, one observes rapid decrease in size of the thymus, spleen, lymph glands and liver; disappearance of fat tissue; oedema formation, especially in the thymus and loose retroperitoneal connective tissue; accumulation of pleural and peritoneal transudate; loss of muscular

tone; fall of body temperature; formation of acute erosions in the digestive tract, particularly in the stomach, small intestine and appendix; loss of cortical lipoids and chromaffin substance from the adrenals; and sometimes hyperemia of the skin, exophthalmos, increased lachrymation and salivation. In particularly severe cases, focal necrosis of the liver and dense clouding of the crystalline lens are observed.

In the second stage, beginning 48 hours after the injury, the adrenals are greatly enlarged but regain their lipid granules, while the medullary chromaffin cells show vacuolization; the oedema begins to disappear; numerous basophiles appear in the pituitary; the thyroid shows a tendency towards hyperplasia (more marked in the guinea pig); general body growth ceases and the gonads become atrophic; in lactating animals, milk secretion stops. It would seem that the anterior pituitary ceases production of growth and gonadotropic hormones and prolactin in favour of increased elaboration of thyrotropic and adrenotropic principles, which may be regarded as more urgently needed in such emergencies.

If the treatment be continued with relatively small doses of the drug or relatively slight injuries, the animals will build up such resistance that in the later part of the second stage the appearance and function of their organs returns practically to normal; but with further continued treatment, after a period of one to three months (depending on the severity of the damaging agent), the animals lose their resistance and succumb with symptoms similar to those seen in the first stage, this phase of exhaustion being regarded as the third stage of the syndrome.

We consider the first stage to be the expression of a general alarm of the organism when suddenly confronted with a critical situation, and therefore term it the 'general alarm reaction'. Since the syndrome as a whole seems to represent a generalised effort of the organism to adapt itself to new conditions, it might be termed the 'general adaptation syndrome'. It might be compared to other general defence reactions such as inflammation or the formation of immune bodies. The symptoms of the alarm reaction are very similar to those of histamine toxicosis or of surgical or anaphylactic shock; it is therefore not unlikely that an essential part in the initiation of the syndrome is the liberation of large quantities of histamine or some similar substance, which may be released from the tissues either mechanically in surgical injury, or by other means in other cases. It seems to us that more or less pronounced forms of this three-stage reaction represent the usual response of the organism to stimuli such as temperature changes, drugs, muscular exercise, etc., to which habituation or inurement can occur.

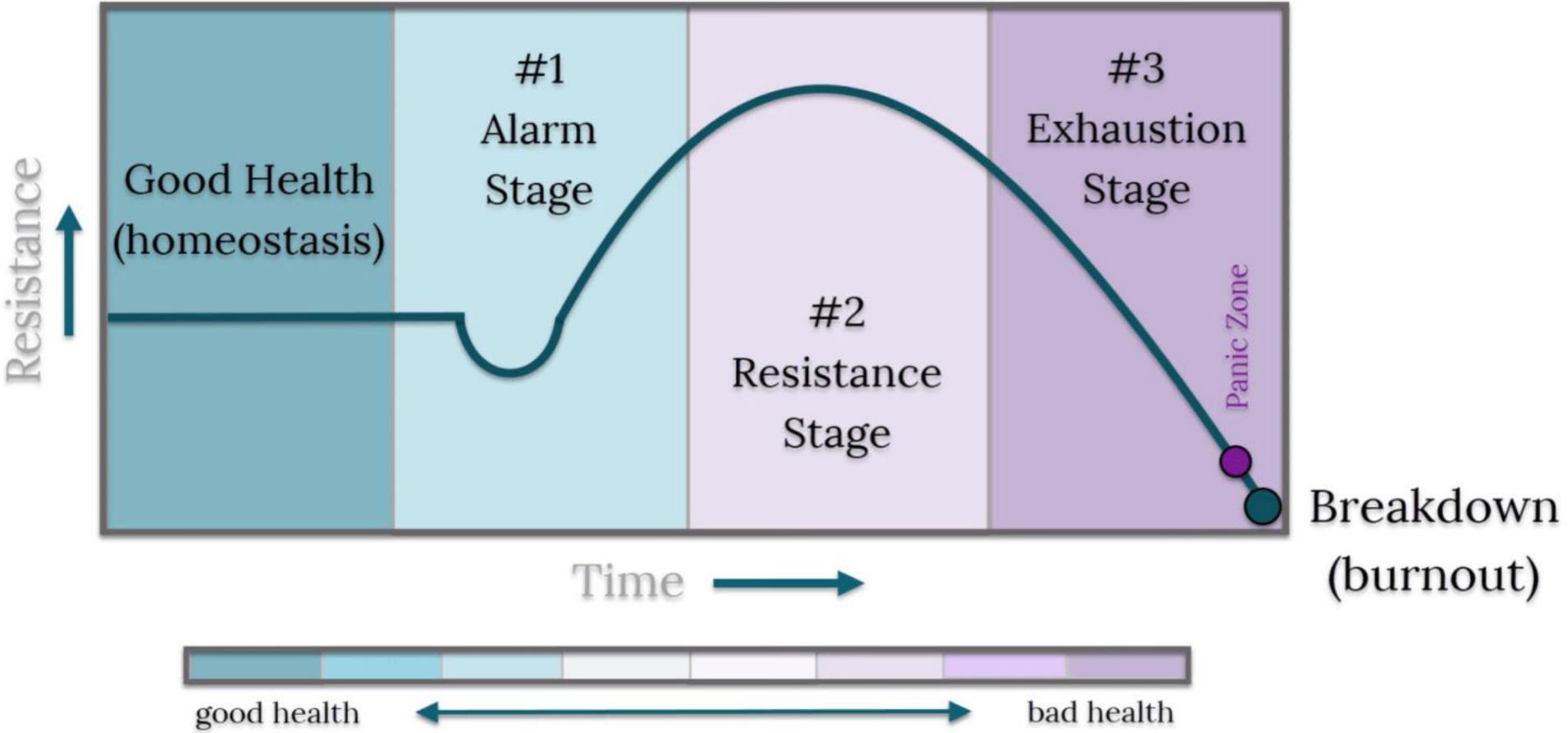
HANS SELYE.

Department of Biochemistry,  
McGill University,  
Montreal, Canada.  
May 18.

## Estimation of Fatty Acids in Organic Mixtures

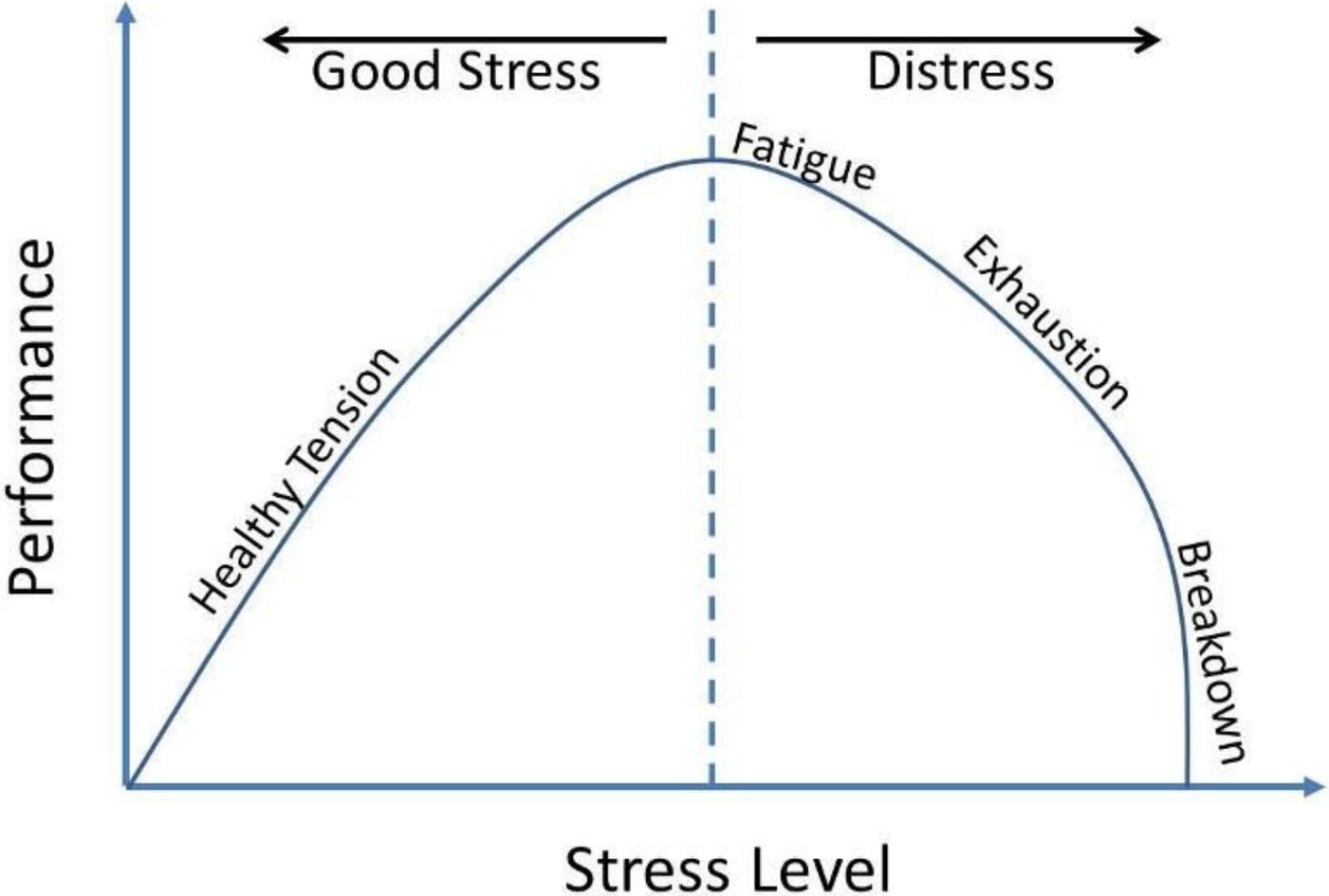
For the determination of the volatile fatty acids in cheese, it is usual to subject the acidified cheese mush to a normal steam distillation at constant volume. In this laboratory, it is the custom to collect a volume of distillate equal to three times the volume of the liquid in the distillation flask, and

# Hans Selye's General Adaptation Syndrome



Handbook of Clinical Neurology Vol. 175, 2020, Ch. 4 - Hypothalamic-pituitary-adrenal axis and stress. Pages 55-64  
Image, <https://drandrewneville.com/adrenal-fatigue-stages/>. Accessed June 18, 2023.1

# Stress & Performance: Yerkes-Dodson Law

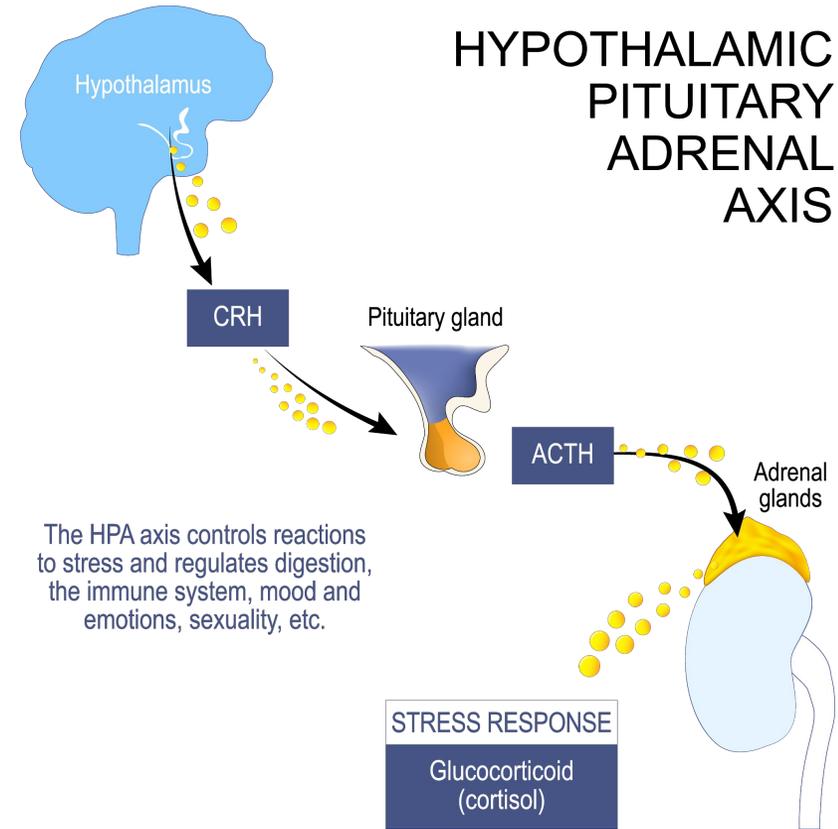


<b>Acute Stress (min-hours)</b>	<b>DURATION</b>	<b>Chronic stress (days-years)</b>
<b>High accountability and autonomy</b>	<b>PSYCHOSOCIAL IMPACT</b>	<b>Low status and lack of control</b>
<b>Increased mobilization to sites likely to be wounded</b>	<b>IMMUNE SYSTEM</b>	<b>Immunosuppression, autoimmune or inflammatory disorders</b>
<b>Increased efficiency to sustain physical exertion</b>	<b>CARDIO-VASCULAR</b>	<b>Hypertension, heart attack, stroke risk</b>
<b>Increased synapse turnover and neuroplasticity</b>	<b>BRAIN</b>	<b>Decreased hippocampal volume and prefrontal function</b>

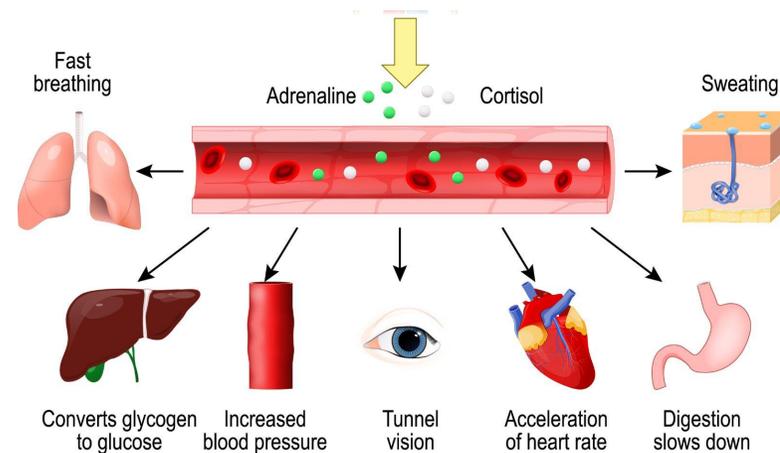
# Stress Response Headquarters = HPA Axis



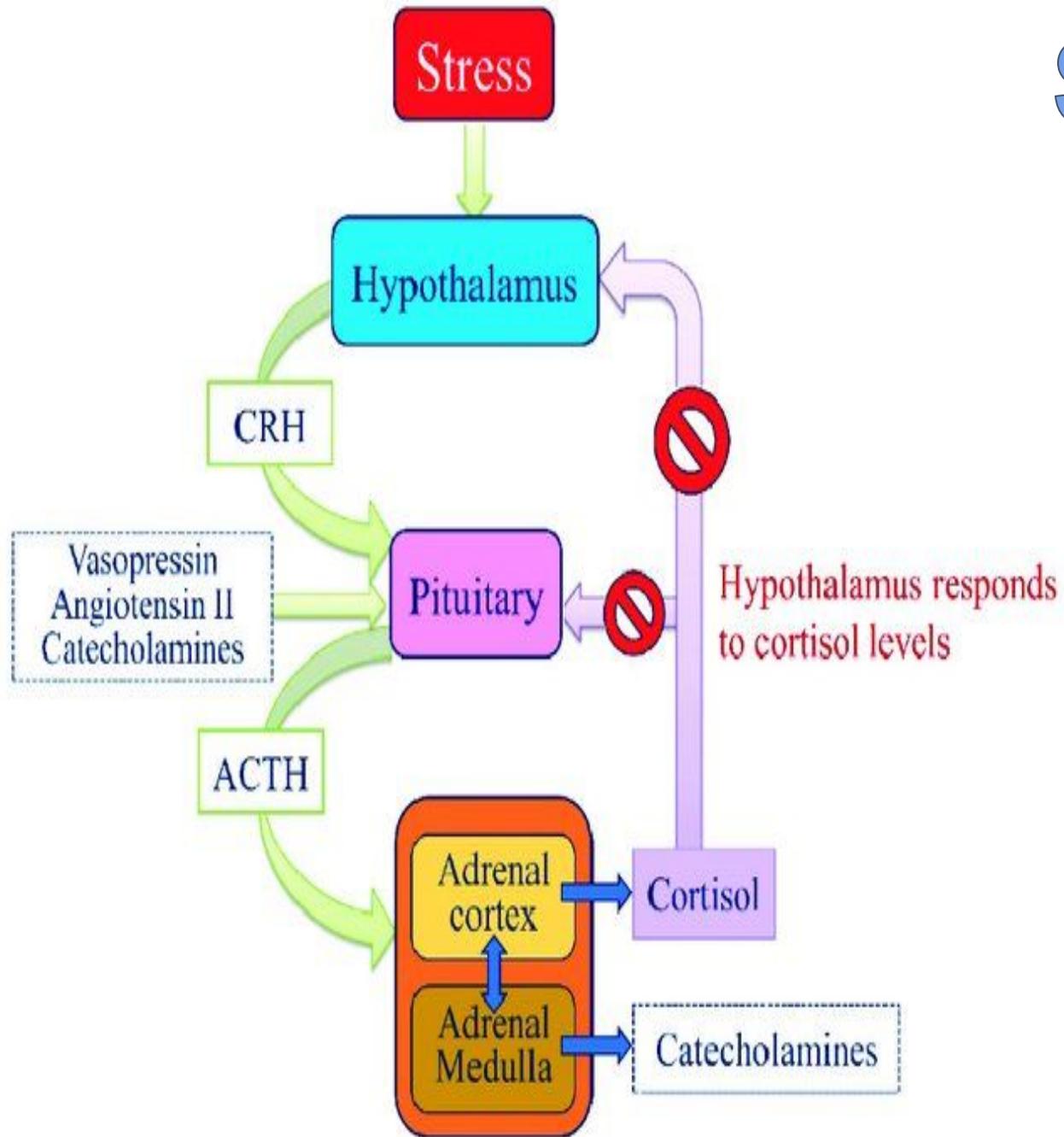
# Stress Response Headquarters = HPA Axis



**“Fight or flight” response**



# Stress Response Headquarters = HPA Axis



# HPA Axis

## Normal Functioning and Disruptions

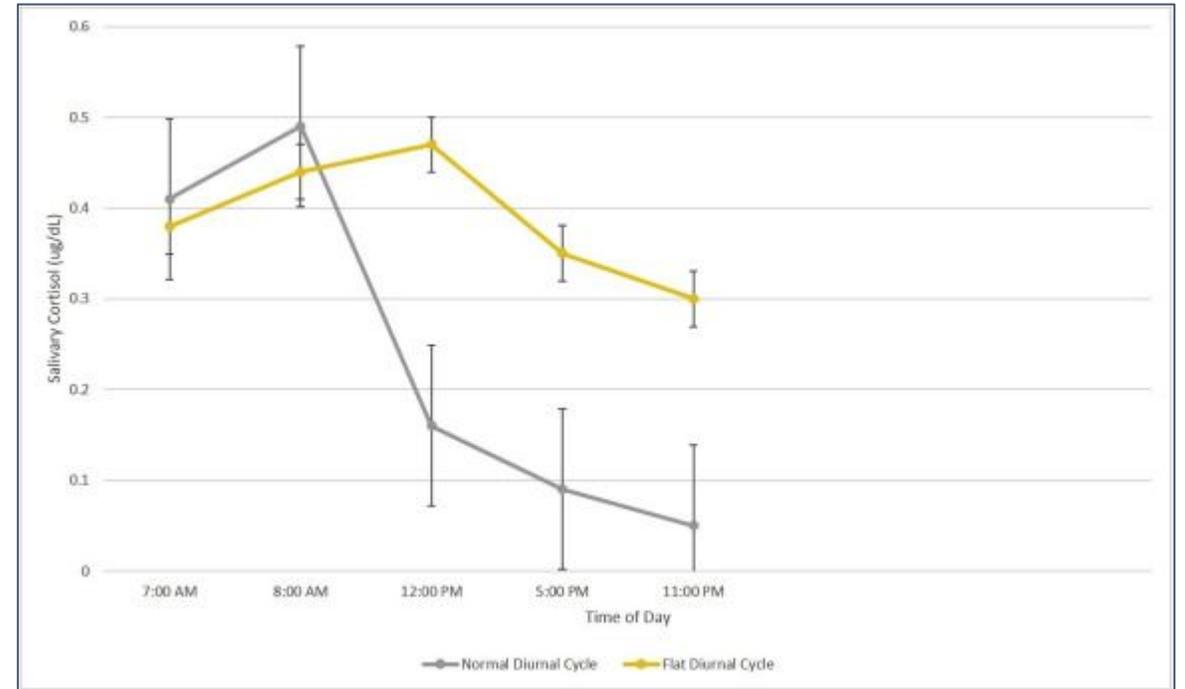
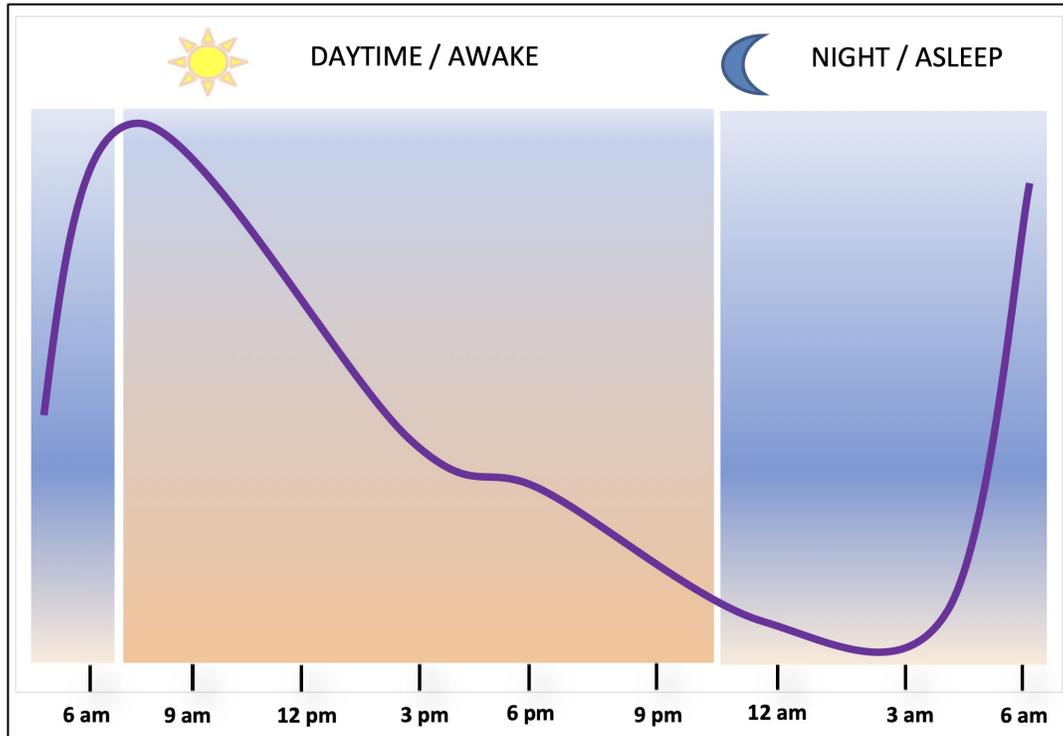


Image from: Speer KE, Semple S, Naumovski N, D'Cunha NM, McKune AJ. HPA axis function and diurnal cortisol in post-traumatic stress disorder: A systematic review. Neurobiol Stress. 2019 Jun 4;11:100180. Figure 2.

# HPA Axis Dysfunction: Correlations

- higher risk for mood, anxiety, and stress-related disorders
- cardiovascular disease and hypertension
- rheumatoid arthritis
- decreased immunity
- greater hospitalization and risk of mortality in patients with COPD
- faster progression of cancer and HIV/AIDS
- frailty in older adults

# Effects of Chronic Stimulation

## Catecholamines

- Linked to anxiety and depression.
- Constant surges can escalate the risk factors for heart diseases

## Cortisol

- Stimulates fat deposits, contributing to (central) weight gain.
- Leads to increased blood pressure
- Increase in protein breakdown, which can affect muscle mass.
- Demineralization of bone, potentially leading to osteoporosis.
- Suppresses the immune system, making us more susceptible to infections and diseases.
- Can cause memory loss, as it affects the hippocampus - the memory center of the brain.
- Associated with depression and other mood disorders.
- Increase in blood sugar levels, risk for diabetes or pre-diabetes.

Ayada C, Toru Ü, Korkut Y. The relationship of stress and blood pressure effectors. Hippokratia. 2015;19(2):99-108.

# Salivary Cortisol Testing

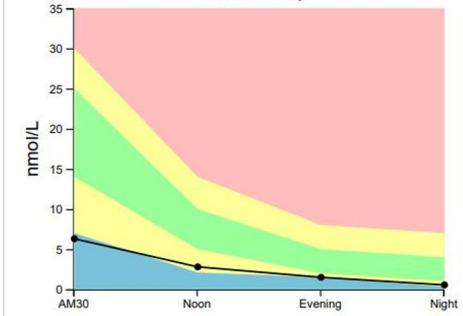
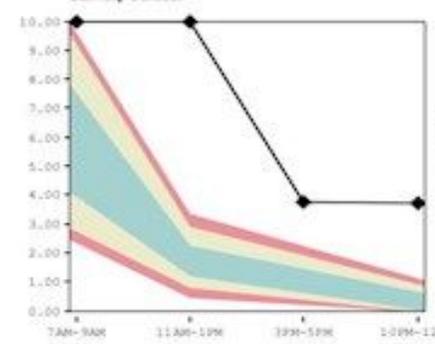




Image by [Rosy](#) from [Pixabay](#)

# Role of Natural Products in Managing Stress

- Vitamin/minerals
- **Adaptogens**



# The History of Adaptogens

Doctor Nikolai Lazarev, a Russian scientist, introduced the term **adaptogen** to the world in 1947.

He defined adaptogens as agents that allow the body to counter adverse physical, chemical, or biological stressors by raising nonspecific resistances toward such stress.

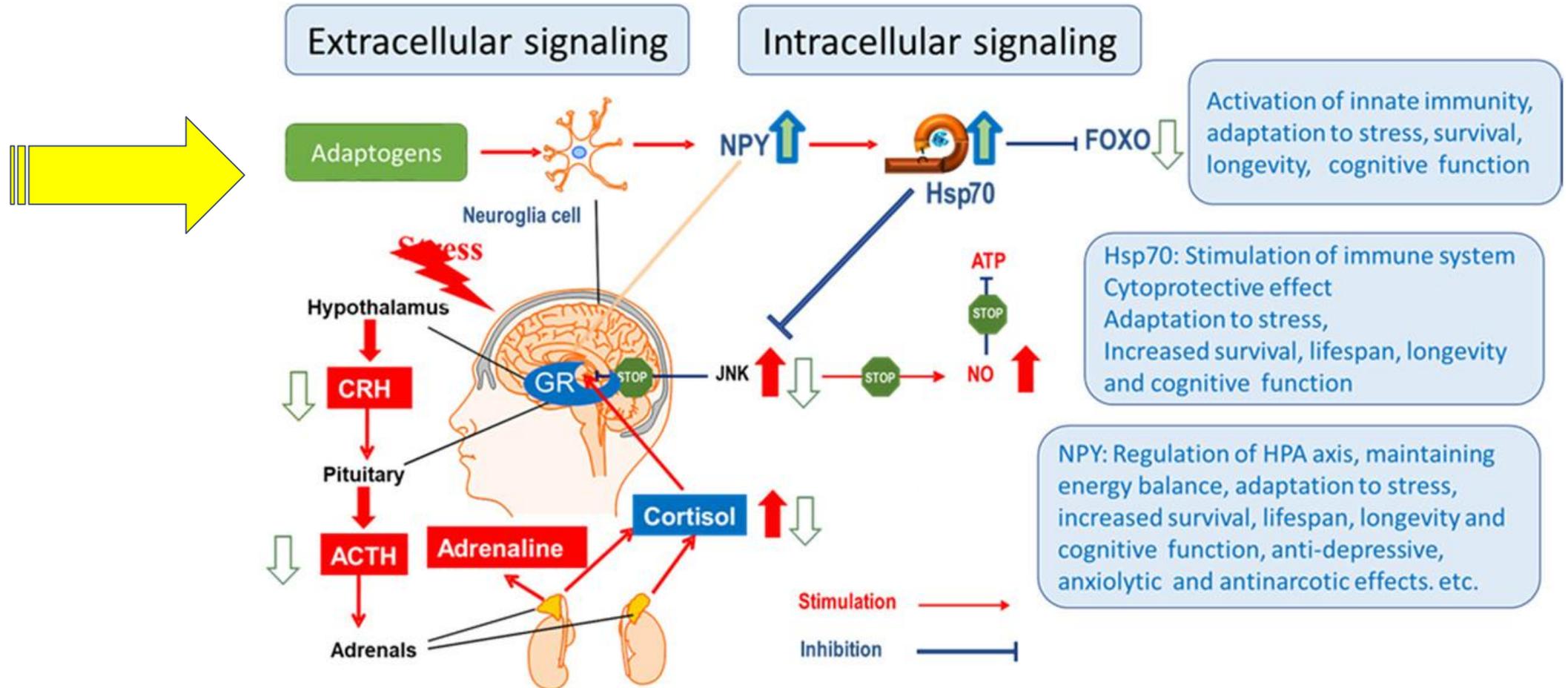


# Initial Definition:

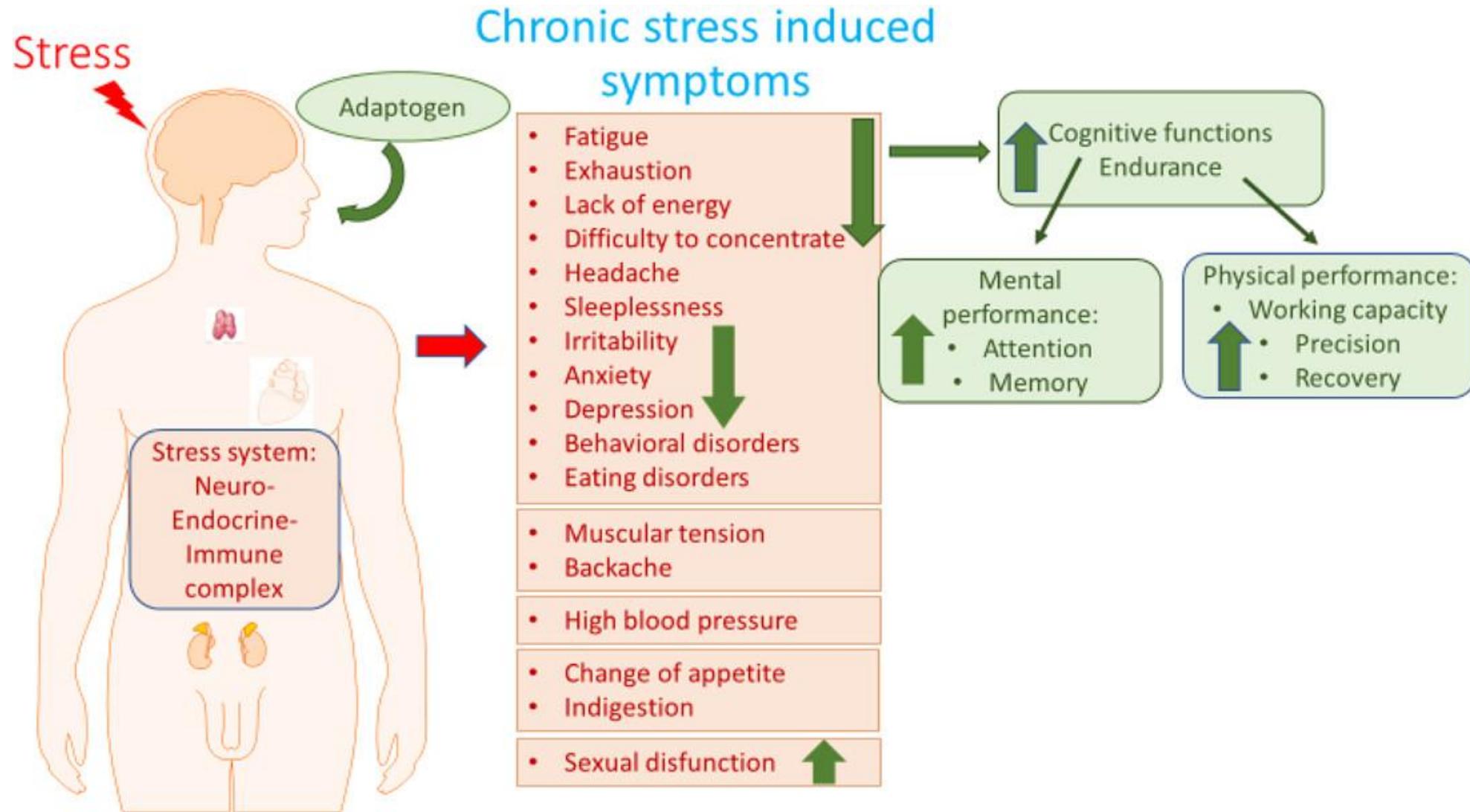
## *The three qualities of adaptogenic herbs*

- 1 Adaptogens are generally safe and have no significant side effects or contraindications.
- 2 Adaptogens bring about a nonspecific response to improve the resilience of the body to resist multiple stressors, including physical, chemical, and psychological.
- 3 Adaptogens have a normalizing influence on the body, bringing it back to balance, regardless of the direction of change.

# Action of adaptogens



# Chronic stress-induced symptoms & adaptogens effects



**Original Investigation**

FREE

October 11, 2016

# Trends in Dietary Supplement Use Among US Adults From 1999-2012

Elizabeth D. Kantor, PhD<sup>1</sup>; Colin D. Rehm, PhD<sup>2</sup>; Mengmeng Du, ScD<sup>1,3</sup>; et al

» [Author Affiliations](#) | [Article Information](#)

*JAMA*. 2016;316(14):1464-1474. doi:10.1001/jama.2016.14403

- 37,958 adults NHANES
- Use remained stable 1999-2012 = 52% any DS

# ADAPTOGENS MARKET

OPPORTUNITIES AND FORECAST, 2021  
- 2031

Adaptogens market is expected to reach **\$20.3 Billion** in 2031

Growing at a **CAGR of 7.3%**  
(2022-2031)

Report Code: A16862,  
[www.alliedmarketresearch.com](http://www.alliedmarketresearch.com)

Image from: Adaptogens Market Research, 2031.  
<https://www.alliedmarketresearch.com/adaptogens-market-A16862>. Accessed 6/18/12.

# Classic + common adaptogens

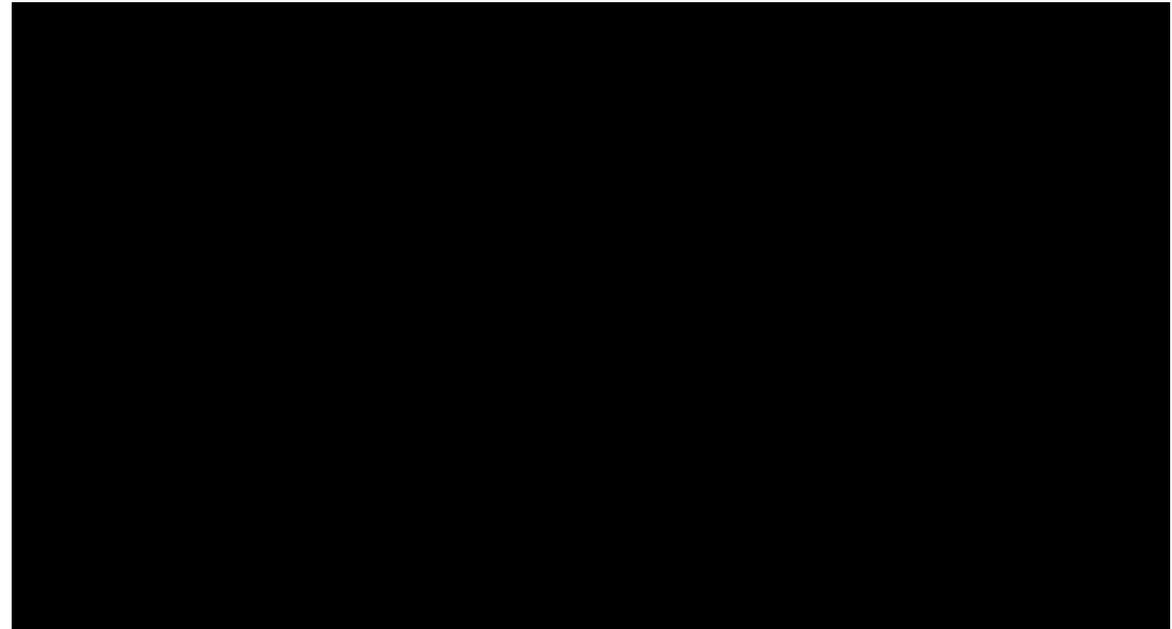
- **Asian Ginseng (*Panax ginseng*)**
- **Ashwagandha (*Withania somnifera*)**
- **Rhodiola (*Rhodiola rosea*)**
- **American Ginseng (*Panax quinquefolius*)**
- **Eleuthero (*Eleutherococcus senticosus*)**
- **Schisandra (*Schisandra chinensis*)**
- **Shilajit (*Asphaltum bitumen*)**
- **Rhaponticum (*Rhaponticum carthamoides*)**
- **Cordyceps (*Cordyceps sinensis*)**
- **Licorice (*Glycyrrhiza glabra*)**
- **Shatavari (*Asparagus racemosus*)**
- **Reishi (*Ganoderma lucidum*)**
- **Holy basil aka Tulsi (*Ocimum tenuiflorum*)**



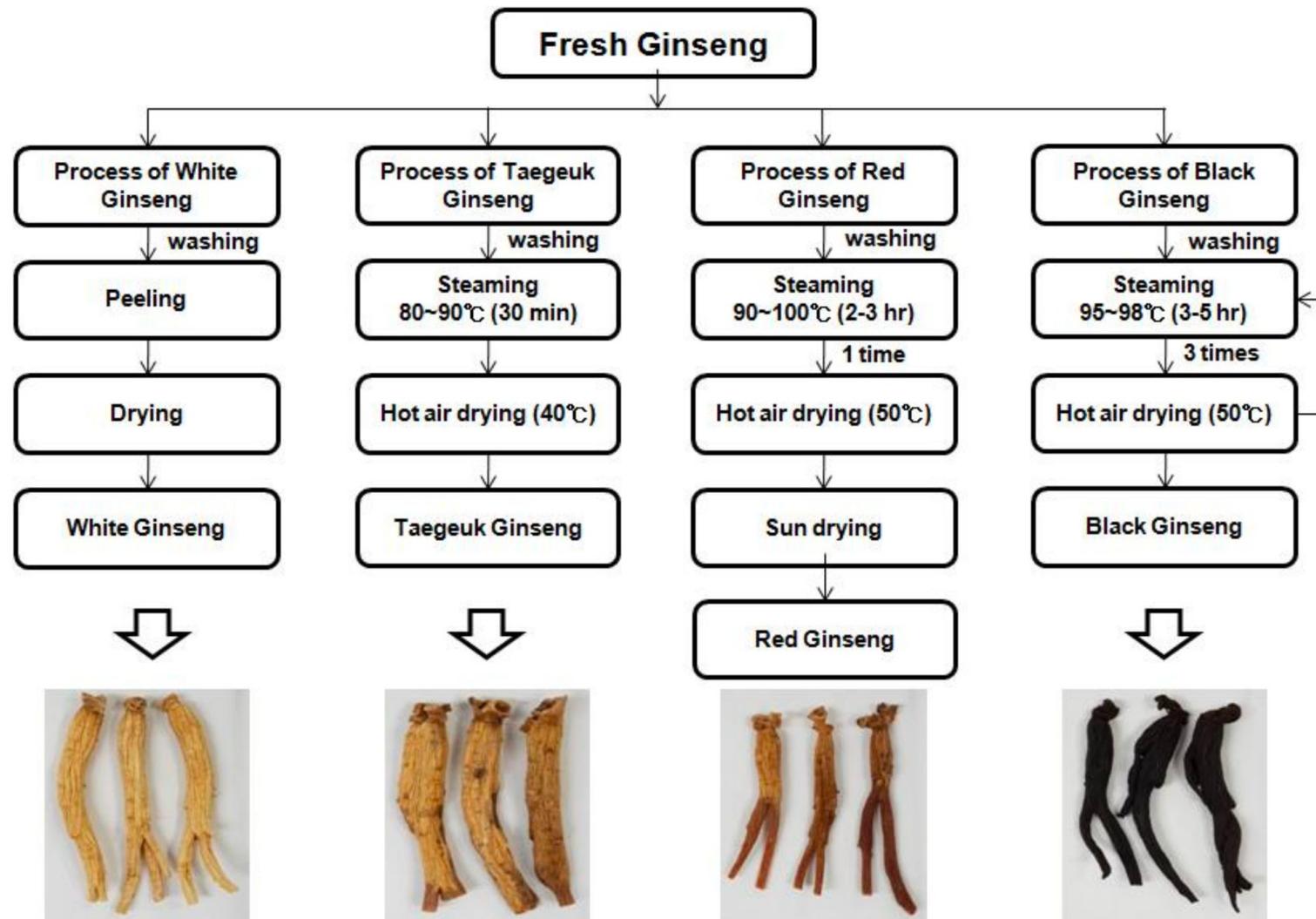
Photo: Getty Images

# Asian Ginseng

## *Panax Ginseng*



- **Traditional Uses:** boost energy, recover from illnesses, and strengthen the elderly or those who are weak
- **Safety**
  - Generally well tolerated up to 6 months.
  - Possible hormone-like effects that could be harmful when used long-term.
  - Most common side effect is trouble sleeping. Uncommon severe side effects include rash, liver damage, and allergic reactions.
- **Avoid** in pregnancy, infants/children
- **Caution**/possible contraindication: autoimmune disease, bleeding issues, certain medications



# Efficacy of Asian Ginseng:



## Possibly Effective for...

- Brain function
- Erectile dysfunction
- Cold and flu Prevention
- Fatigue in chronic illness, cancer
- Boosting sexual response

## Possibly Ineffective for...

- Athletic performance

J Ginseng Res 45 (2021) 32–40

Contents lists available at ScienceDirect

Journal of Ginseng Research

<http://www.ginsengres.org>

**JACM**

THE JOURNAL OF ALTERNATIVE AND COMPLEMENTARY MEDICINE  
Volume 24, Number 7, 2018, pp. 624–633  
© Mary Ann Liebert, Inc.  
DOI: 10.1089/acm.2017.0361

**REVIEW ARTICLES**

**Ginseng as a Treatment for Fatigue:  
A Systematic Review**

Noël M. Arring, DNP, RN, OCN;<sup>1,2</sup> Denise Millstine, MD;<sup>2,3</sup>  
Lisa A. Marks, MLS, AHIP;<sup>4</sup> and Lillian M. Nail, PhD, RN, FAAN<sup>5</sup>

**Abstract**  
**Background:** Millions of people with chronic illness suffer from fatigue. Fatigue is a complex, multidimensional symptom with poorly understood causes, wide variations in severity among individuals, and negative effects on multiple domains of daily life. Many patients with fatigue report the use of herbal remedies. Ginseng is one of the most widely used because it is believed to improve energy, physical and emotional health, and well-being.  
**Objective:** To systematically review the published evidence to evaluate the safety and effectiveness of the two types of Panax ginseng (Asian [*Panax ginseng*] and American [*Panax quinquefolius*] as treatments for fatigue.  
**Design:** PubMed, CINAHL (Cumulative Index to Nursing and Allied Health), Ovid MEDLINE, and EMBASE databases were searched using Medical Subject Heading and keyword terms, including ginseng, Panax, ginsenosides, ginsenoside\* (wild card), fatigue, fatigue syndrome, cancer-related fatigue, and chronic fatigue. Studies were included if participants had fatigue, had used one of the two Panax ginsengs as an intervention, and had scores from a self-report fatigue measure. Two reviewers independently assessed each article at each review phase and met to develop consensus on included studies. Risk of bias was assessed using version 5.3 of the Cochrane Collaboration Review Manager (RevMan), and results were synthesized in a narrative summary.  
**Results:** The search strategy resulted in 149 articles, with 1 additional article located through review of references. After titles, abstracts, and full text were reviewed, 139 articles did not meet inclusion criteria. For the 10 studies reviewed, there was a low risk of adverse events associated with the use of ginseng and modest evidence for its efficacy.  
**Conclusions:** Ginseng is a promising treatment for fatigue. Both American and Asian ginseng may be viable treatments for fatigue in people with chronic illness. Because of ginseng's widespread use, a critical need exists for continued research that is methodologically stronger and that includes more diverse samples before ginseng is adopted as a standard treatment option for fatigue.

**Keywords:** complementary and integrative health, herbal, Panax, symptom management

**Introduction**  
MILLIONS OF PEOPLE in the United States experience fatigue as a symptom of chronic illness or as an adverse event (AE) of the treatment of chronic illness, or both.<sup>1,2</sup> Fatigue is a complex, multidimensional symptom with poorly understood causes, wide variations in severity among individuals, and negative effects on multiple domains of daily life.<sup>3</sup> Negative effects include decreased work productivity, physical activity, social interaction, and recreational activity, as well as feelings of loss and sadness.<sup>4</sup>  
Over 32% of the population of the United States uses complementary and alternative medicine,<sup>5</sup> with ginseng being on the top-10 list of the most-used natural products.<sup>6</sup> People

on modulation of immune

Yi-Seong Kwak<sup>3</sup>, Chang-Kyun Han<sup>3</sup>,  
Hyeoung Min<sup>6</sup>, You-Jung Jung<sup>7</sup>,  
Jae Youl Cho<sup>3,4,\*</sup>

Technology, Kihun, Bangladesh

State, Republic of Korea

SOURCES, Incheon, Republic of Korea

al practices have used natural products such as adaptogens to treat inflammatory, regenerative, bacterial, and viral diseases since the early days of civilization. Panax ginseng herb used in East Asian countries for millennia, especially in Korea, China, and Japan, indicates that ginseng can modulate the immune system and thereby prevent the human immune system comprises many different types of cells, multiple studies have shown that immune cell can be controlled or stimulated by ginseng or its derivatives. Ginseng's potential for use against viruses, bacteria, and other microorganisms suggest a valuable pharmaceutical resource, particularly if higher-quality evidence can be obtained. The role of ginseng as an immune-modulating agent in attempt to provide a hint for future studies on the herb and the human immune system.

Society of Ginseng. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

central nervous system—stimulating activities, and they may be able to optimize hormone production and help balance physiological stress responses [2].

Ginseng is a noted adaptogenic herbs that has been utilized as a herbal remedy in East Asian countries since its discovery in the mountains of Manchuria, China, more than 5,000 years ago [3]. A member of the Araliaceae family, ginseng comprises 8 to 13 species of the Panax genus, including *P. ginseng*, all of which are usually recognized as "Asian or Chinese ginseng." *P. notoginseng* is known as "Sancha" and *P. quinquefolius* is commonly called "American ginseng" [4]. The genus name Panax is originated from "panacea" meaning a cure for all diseases. This terminology is at least partially

andwan University, Saseon, 16410, South Korea

Sejeon, Republic of Korea

Ngong, NSW, Australia

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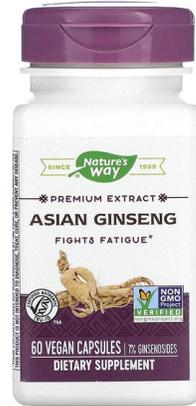
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<sup>1</sup>Department of Nursing, Mayo Clinic, Phoenix, AZ.  
<sup>2</sup>Divisions of Integrative Medicine and Health and <sup>3</sup>Women's Health Internal Medicine, Mayo Clinic, Scottsdale, AZ.  
<sup>4</sup>Library Services, Mayo Clinic, Scottsdale, AZ.  
<sup>5</sup>School of Nursing, Oregon Health & Science University, Portland, OR.  
<sup>6</sup>Student at Oregon Health & Science University, Portland, OR.

# Ginseng Supplements

Recommended daily doses:

- Standardized **extract** taken as 100 mg twice daily (providing at least 6 mg of ginsenosides)
- Root powder 1,000 to 2,000 mg (providing 15 to 30 mg of ginsenosides)
- Effects may take a few days or weeks to develop.



# Culinary Medicine:

## Ginseng-enriched Nutritious Broths

**Prepare:** Rinse ginseng under cold water to clean. If using dried ginseng, consider soaking it in water for a few hours to soften it (then use the water)

**Cook Low and Slow:** Add to slow-cooked soups and broths, as the long cooking time helps to extract its flavor and beneficial compounds.

**Combine with Complementary Flavors:** Ginseng has a unique, earthy flavor that pairs well with ingredients like chicken, garlic, and ginger.

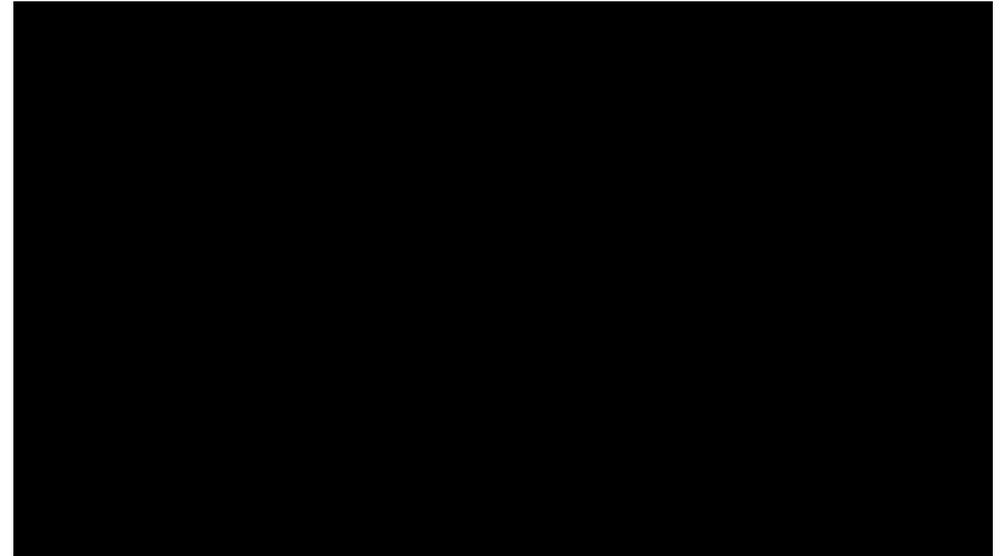
**Be Mindful of Quantity:** Ginseng has a strong flavor, so use a small amount and adjust to taste.



# Ashwagandha

## *Withania somnifera*

- **Traditional use:**
  - stress tolerance, vigor and stamina, convalescence, nervous exhaustion, fatigue, geriatric debility, physical and mental stress, and insomnia
- Possibly safe when used for up to 3 months. Long-term safety is not known.
- Large doses of ashwagandha might cause stomach upset, diarrhea, and vomiting. Rarely, liver problems, might occur.
- **Avoid** in pregnancy.
- **Caution** with autoimmune disease, some medications/ disease interactions.



# Possibly Effective for...

**Insomnia.** Taking ashwagandha seems to improve overall sleep and sleep quality in some people.

**Stress.** Taking ashwagandha by mouth seems to help reduce stress in some people. It might also help reduce stress-related weight gain.

**PLOS ONE**

RESEARCH ARTICLE  
Effect of Ashwagandha (*Withania somnifera*) extract on sleep: A systematic review and meta-analysis

Kae Ling Cheah<sup>1</sup>, Mohd Noor Norhayati, Lili Husniati Yaacob<sup>1\*</sup>, Razlina Abdul Rahman<sup>1</sup>

Department of Kelantan, M  
\* husniati@

**Phytotherapy Research**

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**

Camellia Akhgarjand, Farzaneh Asoudeh, Amir Bagheri, Zahra Kalantar, Zahra Vahabi, Sakineh Shab-bidar, Hamid Rezvani, Kurosh Djafarian

First published: 25 August 2022 | <https://doi.org/10.1002/ptr.7598> | Citations: 1

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**Abstract**

Clinical trial studies revealed conflicting results on the effect of Ashwagandha extract on anxiety and stress. Therefore, we aimed to evaluate the effect of Ashwagandha supplementation on anxiety as well as stress. A systematic search was performed in PubMed/Medline, Scopus, and Google Scholar from included randomized clinical trials (RCTs) andha extract on anxiety and stress. The dom-effects model and the standardized fidence interval (CIs) for outcomes were with a total sample size of 1,002 25 and 48 years were included in the analysis. We found that Ashwagandha d anxiety (SMD: -1.55, 95% CI: -2.37, level (SMD: -1.75; 95% CI: -2.29, -1.22; placebo. Additionally, the non-linear avorable effect of Ashwagandha 000 mg/d and stress at dose of 300–600 ertainty of the evidence was low for both view and dose–response meta-analysis of oth stress and anxiety following urther, further high-quality studies are efficacy of the plant.



# Ashwagandha Supplements



Often standardized to withanolides — key marker compounds which may play a role in the herb's activity.

## Daily dosage

- root powder is typically 1-6 g , containing, at least 0.3% withanolides
- root extracts 500 to 1,500 mg, containing, at least 1.5% of withanolides
- A daily dose should provide at least 6 mg of withanolides — typically 10 - 30 mg has been used in most studies.

# Culinary Medicine:

## Ashwagandha Energy Balance Truffles



### Ingredients:

10 dates, dried and pitted

2 teaspoons ashwagandha powder

1/2 cup dark chocolate chips

1 teaspoon coconut oil, refined

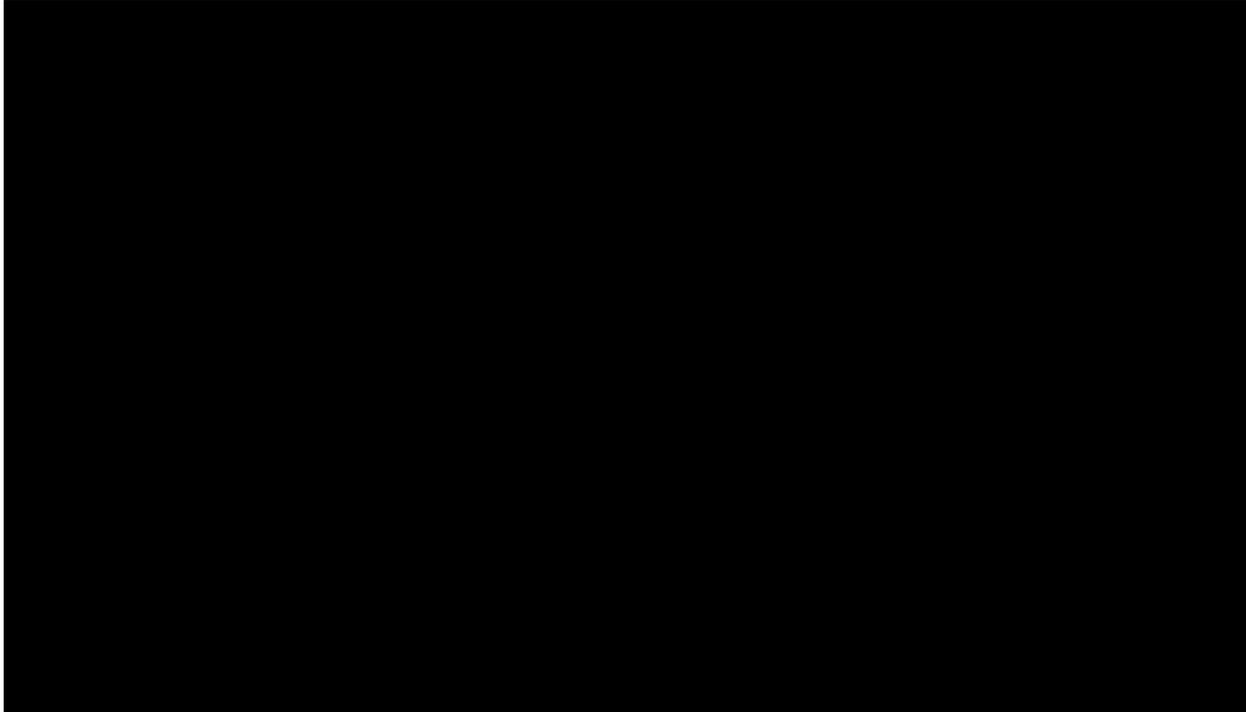
Optional: Dried coconut, sea salt, sesame seeds, cacao for topping

### Directions:

- Start by blending the dates and ashwagandha together in a blender or food processor until they form a paste. Shape this mixture into small balls. If the paste is too sticky to shape, refrigerate for about 10 minutes.
- Heat your chocolate chips and coconut oil together in a small pan over medium heat. Make sure to stir frequently to prevent burning.
- Next, dip each of your date balls into the chocolate, making sure to coat them evenly. You can use a spoon to help remove them from the chocolate. Place your coated date balls onto a baking sheet lined with parchment paper.
- Finish off your treats by sprinkling them with preferred optional toppings.
- Put your date balls into the refrigerator or freezer to allow to set.
- These treats are best enjoyed when they're still a little bit chilled.

# Rhodiola

## *Rhodiola rosea*



- Possibly safe when taken for 6-12 weeks. There isn't enough reliable information to know if rhodiola is safe to use long-term
- Might cause dizziness, dry mouth, or excessive saliva..
- Caution in pregnancy, autoimmune conditions and with certain meds/conditions.

# Possibly Effective for...

Fatigue

Mental Performance

Depression

Generalized Anxiety



A double-blind, placebo-controlled pilot study of the stimulating and adaptogenic effect of *Rhodiola rosea* SHR-5 extract on the fatigue of students caused by stress during an examination period with a repeated low-dose regimen

A.A. Spasov<sup>1</sup>, G.K. Wikman<sup>2</sup>✉, V.B. Mandrikov<sup>1</sup>, I.A. M...

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[https://doi.org/10.1016/S0944-7113\(00\)80078-1](https://doi.org/10.1016/S0944-7113(00)80078-1)

## Summary

The objective was to investigate the stimulating and adaptogenic effect of *Rhodiola rosea* extract SHR-5 in foreign students during an examination period with a repeated low repeated dose regime. The study drug and the placebo were administered to the students during an examination period. The physical performance was assessed before and after the period, based on objective tests. The most significant improvement in the physical performance, mental fitness, mental fatigue and neuro-motoric tests ( $p < 0.05$ ). The general well-being was also significantly ( $p < 0.05$ ) better in the treatment group. The overall conclusion is that the study drug gave significant effects on the physical performance of the group but that the dose level probably was suboptimal.



*Rhodiola rosea* in stress induced fatigue – A double blind cross-over study of a standardized extract SHR-5 with a repeated low-dose regimen on the mental performance of healthy physicians during night duty

V. Darbinyan<sup>1</sup>✉, A. Kteyan<sup>1</sup>, A. Panossian<sup>2</sup>, E. Gabrielian<sup>2</sup>, G. Wikman<sup>3</sup>, H. Wagner<sup>4</sup>

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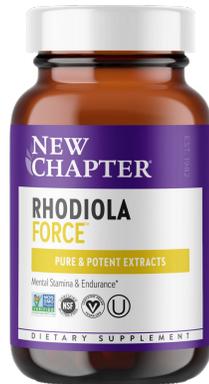
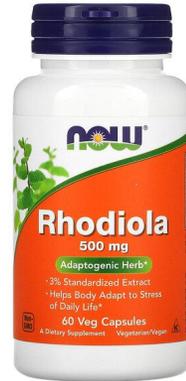
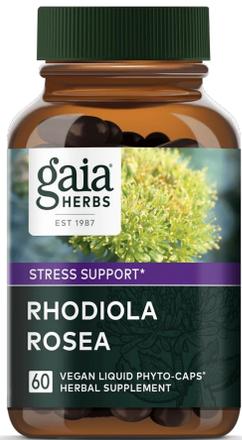
[https://doi.org/10.1016/S0944-7113\(00\)80055-0](https://doi.org/10.1016/S0944-7113(00)80055-0)

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## Summary

The aim of this study was to investigate the effect of repeated low-dose treatment with a standardized extract SHR/5 of rhizome *Rhodiola rosea* L. (RRE) on fatigue during night duty among a group of 56 young, healthy physicians. The effect was measured as total mental performance calculated as Fatigue Index. The tests chosen reflect an overall level of mental fatigue, involving complex perceptive and cognitive cerebral functions, such as associative thinking, short-term memory, calculation and ability of concentration, and speed of audio-visual perception. These parameters were tested before and after night duty during three periods of two weeks each: a) a test period of one RRE/placebo tablet daily, b) a washout period and c) a third period of one placebo/RRE tablet daily, in a double-blind cross-over trial. The perceptive and cognitive cerebral functions mentioned above were investigated using 5 different tests. A statistically significant improvement in these tests was observed in the treatment group (RRE) during the first two weeks period. No side-effects were reported for either treatment noted. These results suggest that RRE can reduce general fatigue under certain stressful conditions.

# Rhodiola Supplements



- Daily doses typically 200 mg - 680 mg of extract
- Often standardized to about 3% rosavins and 1% salidroside
- Divide doses of 400 mg+ into twice daily

# Culinary Medicine: Rhodiola Latte

## Ingredients

- 1 cup unsweetened almond milk
- ¼ cup filtered water
- 2 rooibos tea bags
- 1 scoop of organic rhodiola powder
- sweetener of your choice

## Recipe

- To prepare this recipe, bring the water to a boil in a pot.
- Next, add the rhodiola, almond milk, and rooibos tea bags to the boiling water. Allow the rooibos tea bags to steep for about 5 minutes to extract all the flavors.
- Strain the mixture through a mesh strainer directly into your favorite mug.
- Finally, sweeten your latte to your preference. You can use any sweetener you like, such as honey, agave syrup, or stevia.

Now your latte is ready to enjoy! Remember, the key to a perfect latte is to balance the flavors according to your taste.



# Combination Products and Adrenal Glandulars

Supplement Facts		
Serving Size 2 Capsules		
Servings Per Container 30		
	Amount Per Serving	% Daily Value
Calories	5	
Total Carbohydrate	1g	<1%*
Siberian Rhodiola ( <i>Rhodiola rosea</i> ) root extract		
Rosavins		
Holy Basil ( <i>Ocimum sanctum</i> ) leaf supercritical CO <sub>2</sub> extract		
Eugenols		
Proprietary Extract Blend		
Organic Oats ( <i>Avena sativa</i> ) milky seed extract		
Basil ( <i>Ocimum sanctum</i> ) leaf, Schisandra berry, Ashwagandha ( <i>Withania somnifera</i> )		

Supplement Facts		
Serving Size 1 Veg Capsule		
	Amount Per Serving	% Daily Value
Vitamin C (from Calcium Ascorbate)	33 mg	37%
Pantothenic Acid (from Calcium Pantothenate)	10 mg	200%
Calcium (from Calcium Carbonate and Ascorbate)	12 mg	1%
Magnesium (from Magnesium Oxide)	8 mg	2%
Chromium (from Chromium Nicotinate Glycinate (TRAACS™))	20 mcg	57%
Relora™ (Proprietary blend of <i>Magnolia officinalis</i> bark extract and <i>Phellodendron amurense</i> bark extract)	200 mg	†
Green Tea Extract ( <i>Camellia sinensis</i> ) (Leaf) [min. 50% EGCg (Epigallocatechin Gallate)]	90 mg	†
Ashwagandha Extract ( <i>Withania somnifera</i> ) (Root and Leaf)	20 mg	†
Holy Basil Extract ( <i>Ocimum tenuiflorum</i> ) (Leaf)	20 mg	†
Reishi Mushroom Powder ( <i>Ganoderma lucidum</i> )	20 mg	†
Rhodiola Extract ( <i>Rhodiola rosea</i> ) (Root)	20 mg	†
† Daily Value not established.		

SUPPLEMENT FACTS		
Serving Size: One Capsule		
One Capsule Contains:		% DV
Adrenal Cortex (Bovine)	50 mg	*
*Daily Value (DV) not established		

Supplement Facts		
Serving Size	1 Capsule	
Servings Per Container	150	
Amount Per Serving		% Daily Value
Adrenal Tissue (Bovine, Lyophilized)	100 mg	†
† Daily Value not established.		

# Using Dietary Supplements: My Three Essential Questions

- 1. Is it safe?**
2. Is there evidence that it may work?
3. Is it a good quality product?

# Regulation of Dietary Supplements in the US

**True** or **False**

Dietary supplements are not regulated.

# Regulations at a Glance

<b>FDA-regulated products</b>	<b>Pre-market approval (FDA)</b>	<b>Pre-market notification (FDA)</b>	<b>Labeling (FDA)</b>	<b>Mandatory adverse event reporting (FDA)</b>	<b>GMPs (FDA)</b>	<b>Facility registration (FDA)</b>	<b>Advertising (FTC or FDA)</b>
Foods		✓	✓		✓	✓	✓ FTC
Dietary supplements		✓	✓	✓	✓	✓	✓ FTC
Drugs	✓		✓	✓	✓	✓	✓ FDA
Biologics	✓		✓	✓	✓	✓	✓ FDA
Medical devices	✓		✓	✓	✓	✓	✓ FDA

# Dietary Supplement Health Education Act of 1994 (DSHEA)

Dietary supplement is **defined as:**

“... a product **taken by mouth** that contains a dietary ingredient intended **to supplement the diet**...”

• Ingredients may include:

- Vitamins
- Minerals
- Herbs/botanicals
- Amino acids
- Other substances



# Safety Issues Overview

- RISK 1: **\*\*Hidden Ingredients\*\***
- RISK 2: **\*\*Contamination\*\***
- RISK 3: **\*\*Natural Doesn't Always Mean Safe\*\***
- RISK 4: **\*\*Mix and Match Woes\*\***
  - \*Herb-Drug Mix-ups\*
  - \*Supplement-Condition Clashes\*
  - \*Too Many Cooks in the Kitchen\*
- RISK 5: **\*\*"Oops Moments"\*\***

# Using Dietary Supplements: My Three Essential Questions

1. Is it safe?
2. **Is there evidence that it may work?**
3. Is it a good quality product?

**Search >**  **Ginseng**

- Interaction Checker
- Effectiveness Checker
- Nutrient Depletion
- Pregnancy & Lactation
- Adverse Effects

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The most authoritative resource available on dietary supplements, natural medicines, and complementary alternative and integrative therapies.

[LEARN MORE](#)



Patient handout for **Panax Ginseng**

[English](#)  
[Spanish](#)  
[French](#)



# Panax Ginseng

SCIENTIFIC NAME

**Panax ginseng, synonym Panax schinseng**

FAMILY

**Araliaceae**

- [Overview](#)
- [Safety](#)
- [Adverse Effects](#)
- [Effectiveness](#)
- [Dosing & Administration](#)
- [Drug Interactions](#)
- [Supplement Interactions](#)
- [Condition Interactions](#)
- [Lab Interactions](#)
- [Overdose](#)
- [Commercial Products](#)
- [Pharmacokinetics](#)
- [Mechanism of Action](#)

**CAUTION:** Panax ginseng should not be confused with [American Ginseng](#), [Blue Cohosh](#), [Canaigre](#), [Codonopsis](#), [Eleuthero](#), or [Panax Notoginseng](#), which are sometimes referred to as ginseng. It should also not be confused with [Ashwagandha](#), which is used as an adaptogen.

## Other Common Names

## Overview

Panax is a genus of slow-growing, deciduous plants that includes 13 different species (89741). While many of these species may be referred to as "ginseng," typically the term "ginseng" is associated with the species Panax ginseng (3122,89741). Panax ginseng grows in Korea, northeastern China, and far-eastern Siberia (3122). It has been used as a calming agent in traditional Chinese Medicine (TCM) and as an "adaptogen" (3122,8600,8604,89738). Adaptogenic herbs are used with the intention of helping the body resist physiological and psychological stress.

# Interaction Checker

- Search
- Interaction Checker**
- Effectiveness Checker
- Nutrient Depletion
- Pregnancy & Lactation
- Adverse Effects

warfarin

- Food, Herbs, Supplements
- Commercial Products
- Health & Wellness
- Drugs

# | [A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [J](#) | [K](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P](#) | [Q](#) | [R](#) | [S](#) | [T](#) | [U](#) | [V](#) | [W](#) | [X](#) | [Y](#) | [Z](#)

Search Matches (Click to Add)

- Warfarin
- Warfarin (Warfarin)
- Warfarin Sodium
- Warheads (Sour Watermelon flavor) by GHOST
- Warm Cream by Strategic Science & Technology
- Warm Cycle Teapills
- Warm Cycle Teapills Wen Jing Wan

Selected Agents (Click to Remove)

- PANAX GINSENG
- Warfarin

Results Summary (Click for Details)

### Interactions found!

Click on any interaction below for more information.

**Warfarin** <<interacts with>> **PANAX GINSENG** [Hide Details](#)

Interaction Rating = **Moderate** Be cautious with this combination.

#### ANTICOAGULANT/ANTIPLATELET DRUGS

Interaction Rating = **Moderate** Be cautious with this combination.

Severity = High • Occurrence = Unlikely • Level of Evidence = B

Although Panax ginseng has shown antiplatelet effects in the laboratory, it is unlikely to increase the risk of bleeding if used with anticoagulant or antiplatelet drugs.

In vitro evidence suggests that ginsenoside constituents in Panax ginseng might decrease platelet aggregation (1522,11891). However, research in humans suggests that ginseng does not affect

# Using Dietary Supplements: My Three Essential Questions

1. Is it safe?
2. Is there evidence that it may work?
- 3. Is it a good quality product?**

# NATURAL HEALTH



Image: Store worker Sam Issa walks past rows of herbal, vitamin and mineral pill products at a suburban pharmacy in Sydney April 29, 2003. PBEAHUOQCGMReuters.

# Quality Seals of Approval



# Ginseng Supplements Review

Find the Best Ginseng Supplement. Key "Ginsenosides" Found to Range 10-Fold Across Products.

Latest Update [Can Ginseng Boost Cognition?](#)



Medically reviewed and edited by Tod Cooperman, M.D.



Approval Status Product Name	Claimed, Minimum Expected and Found Amounts	Heavy Metals Pesticides Pill Size Suggested Serving on Label	Cost for Suggested Serving [Cost Per 10 mg Ginsenosides Found] Price
<b>APPROVED</b> BulkSupplements.com® Ginseng Root Extract 	1/3 tsp [1,000 mg] 1,000 mg [Asian] ginseng root extract ≥70 mg ginsenosides Found: Ginsenosides: 75 mg ✓	Heavy Metals: NA Pesticides: NA Powder in pouch Take 1,000 mg (about 1/3 tsp) once to twice daily, or as directed by a physician.	\$0.19 per 1/3 tsp [0.03] \$18.96/3.5 oz [100 g] pouch (approx. 100 servings)
<b>APPROVED</b> Ginx Nutrition Red Ginseng Immunity Gummy 	3 gummies 375 mg red [Asian] ginseng extract Found: Ginsenosides: 22.5 mg (Expected minimum: 11.3 mg ✓)	Heavy Metals: NA Pesticides: NA Very large gumdrop shaped gummy Take three (3) gummies daily.	\$1.00/3 gummies [0.44] \$29.99/90 gummies
<b>NOT APPROVED</b> Nature's Way® Asian Ginseng 	2 vegan capsules 1,120 mg Asian ginseng root extract Found: Ginsenosides: 26 mg (77.4% of expected minimum of 33.6 mg)	Heavy Metals: NA Pesticides: NA Large vegan capsule Take 2 capsules daily, preferably with food.	\$0.27/2 vegan capsules [0.10] \$13.49/100 vegan capsules
<b>APPROVED</b> Puritan's Pride® Korean Ginseng Extract	1 capsule 100 mg Korean ginseng root extract	Heavy Metals: NA Pesticides: NA	\$0.20/capsule [0.27]

# Conclusions

- **Adaptogens** are natural substances with historical roots in traditional medicine; they help the body adapt to stress and maintain balance through the HPA axis.
- Before using adaptogens, it is crucial to **assess their safety, efficacy, and quality**, while being mindful of risks such as adulteration and interactions.
- While generally safe, **adaptogens have unique profiles** and its best to work with an integrative/functional medicine professional who can guide you towards the right choice for your needs, and monitor its use.