



UW PACC

Psychiatry and Addictions Case Conference

UW Medicine | Psychiatry and Behavioral Sciences

THE CONNECTION BETWEEN MOOD, FOOD, & HEALTH

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SPEAKER DISCLOSURES

- ✓ No relevant conflict of interest to disclose.

PLANNER DISCLOSURES

The following series planners have no relevant conflicts of interest to disclose; other disclosures have been mitigated.

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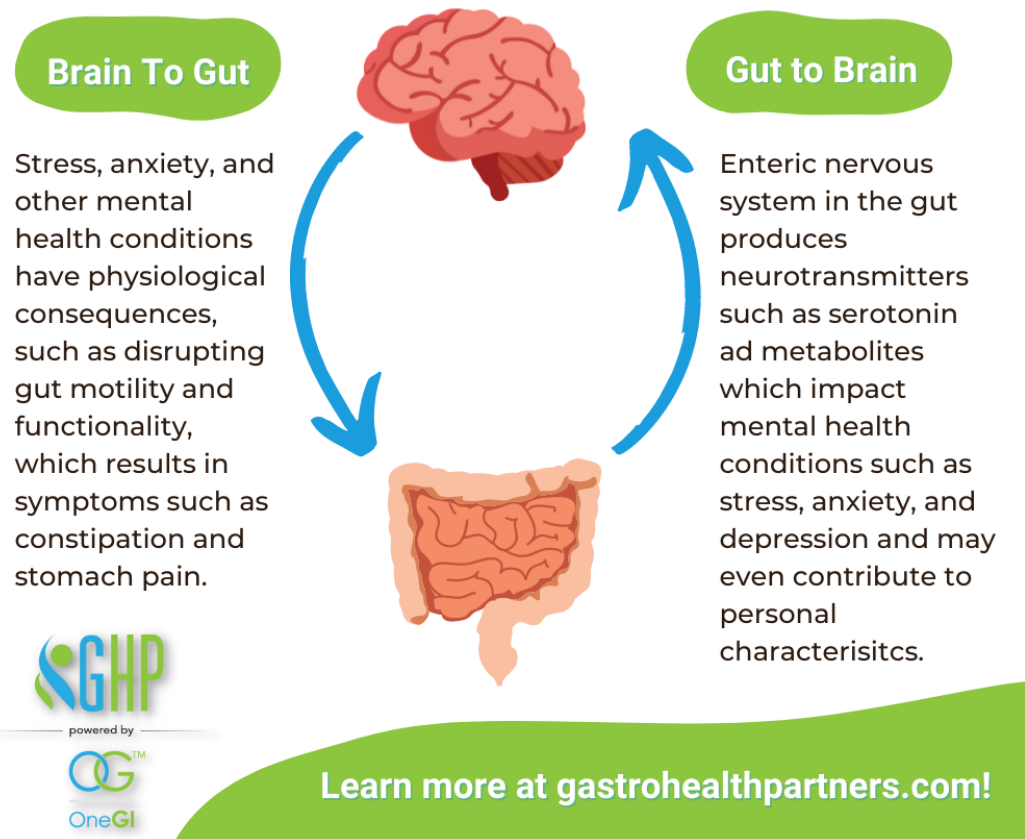
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OBJECTIVES

1. Appreciate the multi-factorial nature of how food affects various aspects of health
2. Review possible mechanisms of how food may regulate our mood
3. Understand how food may affect our cognitive function and how to prevent decline
4. Learn how specific micronutrients may play a role in our health

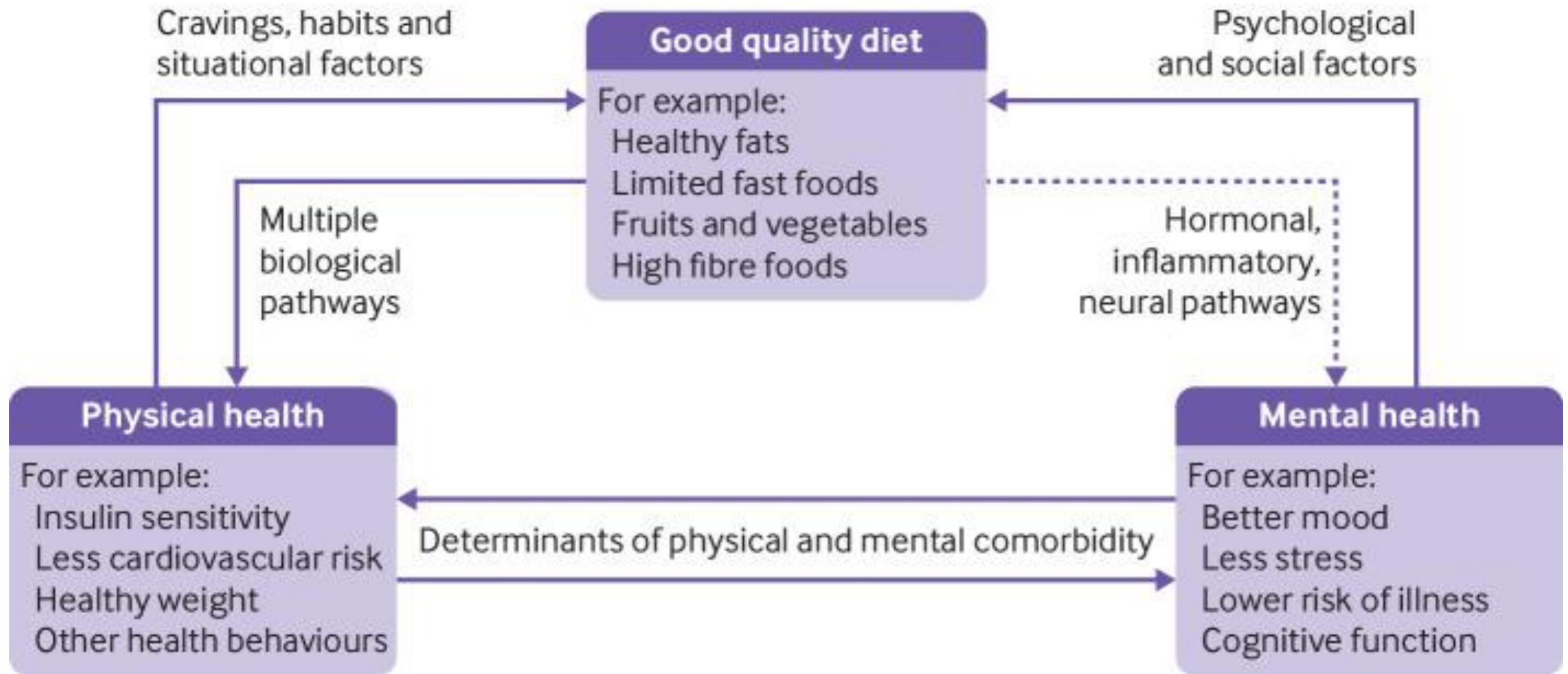
GUT-BRAIN AXIS (GBA)

What is the Gut-Brain Axis (GBA)?

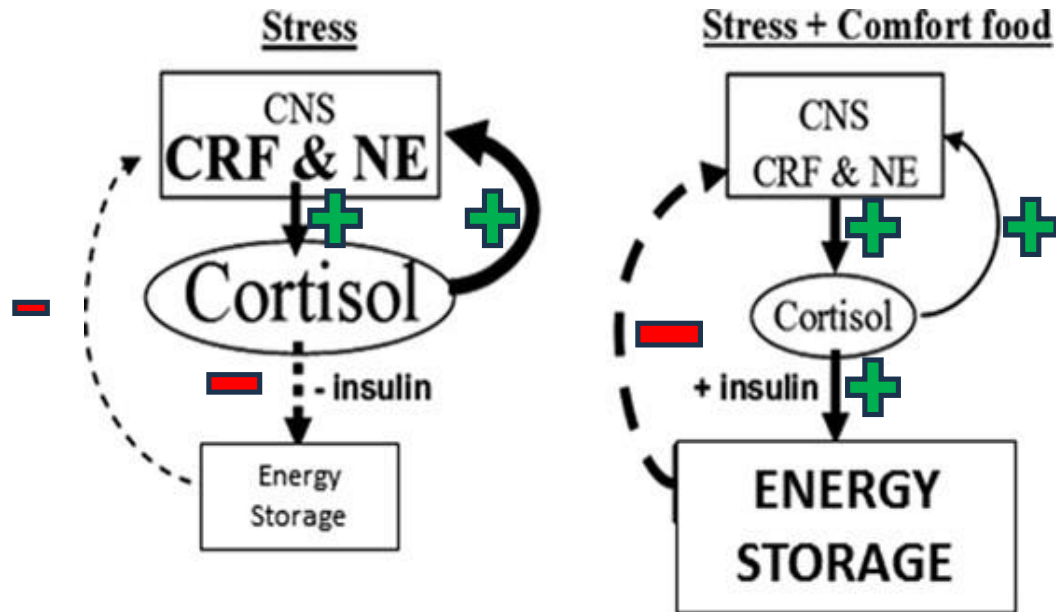


- Gut Microbiota (Microbiome)
 - Digestion
 - Vitamin Synthesis (K and B)
 - Integrity of gut lining
 - Disruption of microbiota has been linked to anxiety, depression, IBS, IBD, etc.
- Neurotransmitter Production & Signaling
 - Serotonin, Dopamine, GABA
- Immune System & Inflammation
 - Visceral hypersensitivity
 - Chronic disease modulation

RELATIONSHIP BETWEEN DIET AND HEALTH



COMFORT FOOD & STRESS



- Stress and palatable food both stimulate **endogenous opioid** release, which reduce stress response.
- Repeated stimulation of our stress pathway (HPA Axis) can lead to dysregulation and contribute to increased food intake and visceral fat accumulation overtime.

BLOOD SUGAR & DEPRESSION

- Diets high in glycemic index have possible casual effect to depressive symptoms.
- Food associated with **LOWER** incidents of depression:
 - **High fiber** foods, including vegetables and fruit (not fruit juice)
 - High lactose food (lactose is a low glycemic index sugar)
- Foods associated with **HIGHER** incidents of depression:
 - **Simple carbohydrates**, like white bread and boiled potatoes (but not yams)
 - **Added sugar** in processed foods

BLOOD SUGAR & MOOD – POSSIBLE MECHANISMS

- Following a rapid increase in blood glucose from diet, the compensatory response can lower plasma blood glucose enough (usually $< 70\text{mg/dL}$) to release hormones such as cortisol, adrenaline, growth hormone, and glucagon.
 - Anxiety
 - Irritability
 - Hunger
 - Cognitive impairment
 - Mood & behavioral changes
 - Fatigue



Photo Credit: dimsumdaily.hk

BLOOD SUGAR & MOOD – POSSIBLE MECHANISMS, CONT.

- Diets high in glycemic index is also associated with **diabetes**, a common comorbid condition with depression. Both lead to insulin resistance due to chronic high insulin production.
- Diet **high in calorie** and **saturated fat** increase inflammation, alter gut permeability and microbiome, as well as blood brain barrier integrity. Together, these may promote neuroinflammation and cognitive dysfunction. They also contribute to cardiovascular and metabolic disease development.
- People with severe mental illnesses have higher level of inflammatory markers and are associated with lower diet quality (high calorie, less nutrient-dense).

DIET AND MENTAL HEALTH IN SPECIFIC POPULATIONS

- For the general population, several meta-analyses and systemic reviews have shown that diets high in fruit, vegetables, fish, whole grain, low fat dairy, antioxidants and low in animal products are associated with a reduced risk of depression or slow the onset of depression.
- In a 2022 systemic review, 25/30 studies showed a positive fluence of diet high in fruit and vegetables on mental health in women of all ages, regardless of the psychological outcome assessed, whether it was anxiety, self-esteem, distress, depressive symptoms, depression, or suicide.
- In a 2021 observational study of 339 undergraduates and their dietary patterns, consumption of junk food (highly processed, snacks, and candies) was positively associated with depression and anxiety.

DIETARY PATTERN THAT SUPPORT MOOD & BRAIN HEALTH

Mediterranean Diet Pyramid

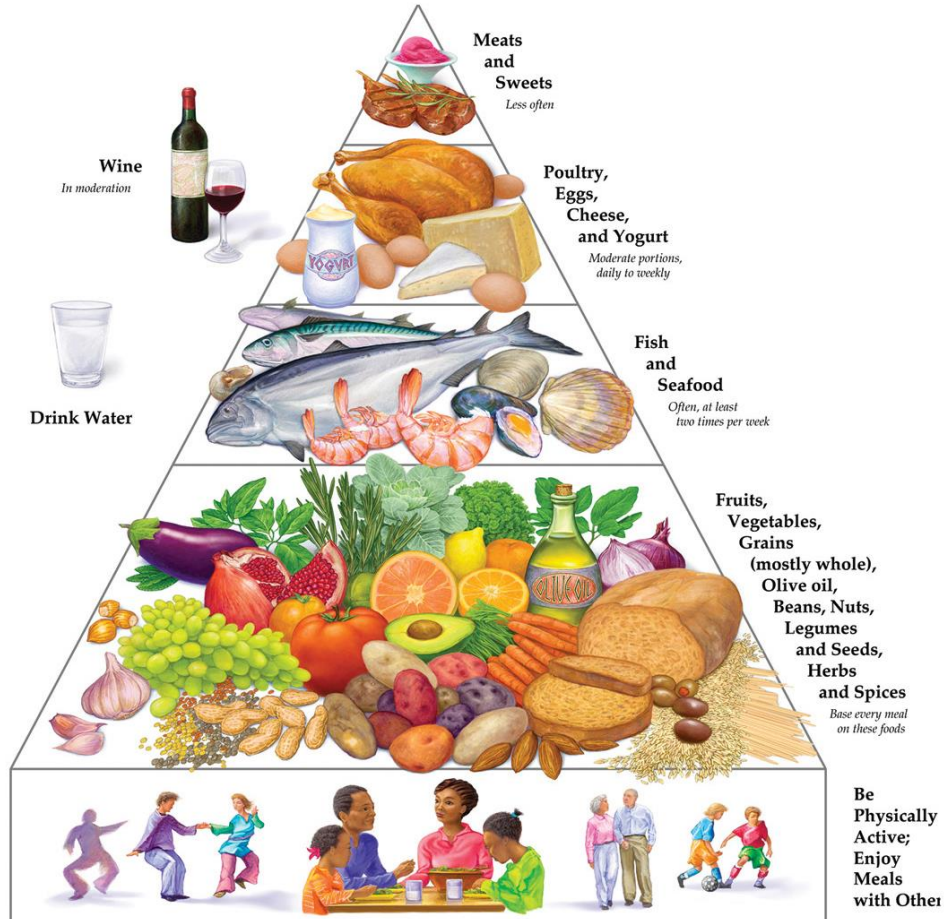


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- Mostly plant-based
- Abundant in fruits and vegetables (at least 5 servings daily)
- Whole/unprocessed grains
- Low sugar (<50g/d)
- Less saturated fats (red meat, full-fat dairy like butter and cream)
- High quality plant fats (nuts, seeds, olive oil, avocado)
- Fish at least 2-3x a week
 - [FDA Advice about Eating Fish](#)
 - [Monterey Bay Seafood Watch “West Coast”](#)

Adapted from Kelly Morrow’s Cha Chi Ming Presentation
“Food for Thought: Meal Planning for Optimal Brain Health”

HERITAGE DIETS FOR VARIOUS CULTURES

rediscover **OLDWAYS** goodness
CULTURAL FOOD TRADITIONS

ASIAN HERITAGE DIET PYRAMID

Claiming Your Health by Claiming Your History

Drink water and tea

Eat less often
meats, sweets

Eat moderate portions, daily to weekly
eggs, poultry, healthy oils, yogurt

Eat often, at least twice a week
fish, seafood

Base every meal on these foods
fruits, vegetables, whole grains, legumes, beans, nuts, seeds, soy foods, herbs, spices

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Be physically active and enjoy meals with others

Learn more about the Asian Heritage Diet at OldwaysPT.org

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CULTURAL FOOD TRADITIONS

AFRICAN HERITAGE DIET PYRAMID

CLAIMING YOUR HEALTH BY CLAIMING YOUR HISTORY

Drink Water

Occasionally
Sweets

Moderate Portions Daily to Weekly
Dairy

Often, At Least Two Times Per Week
Eggs, Poultry & Other Meats, Fish & Seafood, Healthy Oils

Base Every Meal On These Foods
Herbs, Spices, and Traditional Sauces, Whole Grains, Beans & Peas, Peanuts & Nuts, Fruits, Vegetables, Greens, Tubers

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**ENJOY A HEALTHY LIFESTYLE
BE PHYSICALLY ACTIVE AND ENJOY MEALS WITH OTHERS**

OLDWAYS Health Through Heritage

AFRICAN HERITAGE

rediscover **OLDWAYS** goodness
CULTURAL FOOD TRADITIONS

LATIN AMERICAN HERITAGE DIET PYRAMID

Claiming Your Health by Claiming Your History

Beer and wine in moderation

Drink water

Eat less often
sweets, meats

Eat moderate portions, daily to weekly
eggs, poultry, healthy oils, yogurt

Eat often, at least twice a week
fish, seafood

Base every meal on these foods
fruits, vegetables, whole grains, legumes, beans, nuts, seeds, soy foods, herbs, spices

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Be Physically Active and Enjoy Meals With Others

Learn more about the Latin American Heritage Diet at OldwaysPT.org

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VEGETARIAN & VEGAN DIET PYRAMID

Putting More Plants on Your Plate

Drink Water

Options For Vegetarians:
Eggs and/or Dairy including Yogurt, Cheese, Cottage Cheese

Herbs, Spices, Plant Oils

Nuts, Peanuts, Seeds, Peanut/Nut Butters

Beans, Peas, Lentils, Soy

Whole Grains including Quinoa, Rice, Barley, Millet, Oats, Bread, Cereal, Pasta

Fruits and Vegetables

Eat these foods every day

Illustration by George Middleton

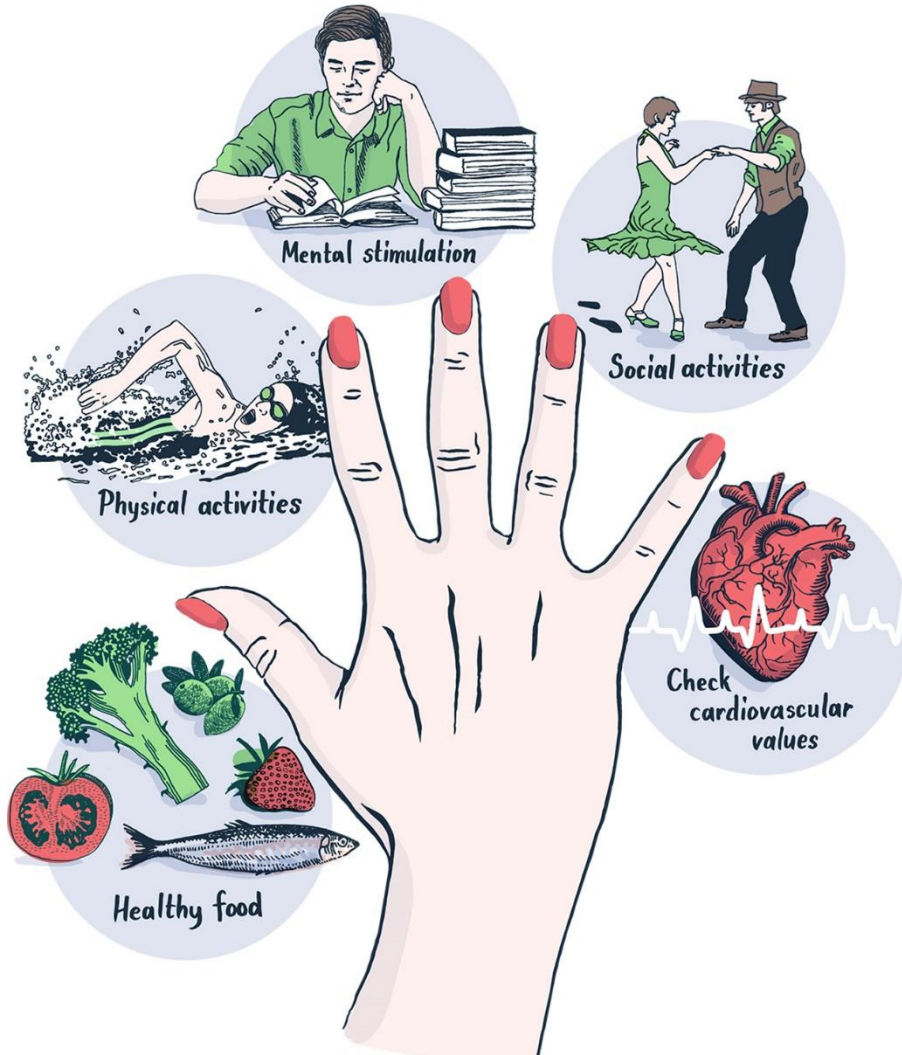
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Be physically active. Cook and share meals with family and friends.

OLDWAYS Health Through Heritage

OLDWAYS VEGETARIAN NETWORK

DIETS STUDIED TO IMPROVE BRAIN HEALTH – ACTIVE DIET



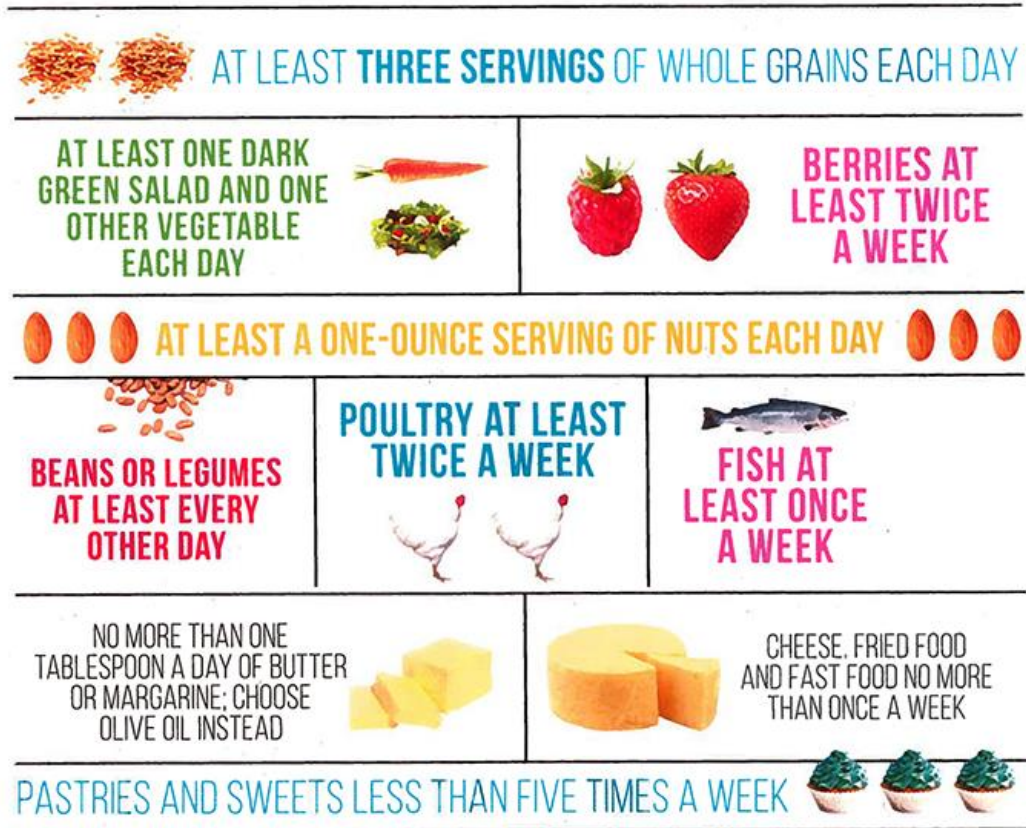
- The Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER) – Lancet 2015
 - 1260 people aged 60-77 at risk of cognitive decline followed over 2 years using 5 domains of intervention. Placebo controlled.
 - Results in 25% overall cognitive improvement, 83% improvement in executive function, 150% improvement in processing speed
- ACTIVE Diet based on a Nordic Diet Pattern
 - At least 5 servings of fruits and vegetables daily
 - Whole grains instead of refined grains
 - Low sugar intake (< 50g/day)
 - Lower fat meat and milk products
 - Plant based oil instead of butter
 - Fish at least twice a week
 - At least 10 mcg of Vitamin D (400 IU), 20 mcg over 75yo

Illustration: Martina Krona from the book "Brain Health" (Miia Kivipelto, Mai-Lis Hellénus)

Photo Credit: FINGERS* Brain Health Institute

DIETS STUDIED TO IMPROVE BRAIN HEALTH – THE MIND DIET

WHAT'S ON THE **MIND DIET**?



- The Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) Diet
 - Introduced by Harvard and Rush University Medical Center in 2015. 4.7 year follow up of 960 participants with a mean age of 81.4.
 - The goal is to focus on chronic diseases linked to development of dementia, like diabetes, CVD, increased homocysteine/CRP, obesity.
 - Similar to the Mediterranean Diet with more emphasis on leafy greens and berries.
 - Limits the following:
 - Red meat, fast/fried foods, pastries/sweets, cheese, butter/margarine.
 - Total mind diet score range from 0 to 15. Individuals with the highest diet scores is estimated to be 7.5 years younger with a reduced risk of developing Alzheimer’s by 53%.

Photo Credit: Pacific Neuroscience Institute

EAT THE RAINBOW

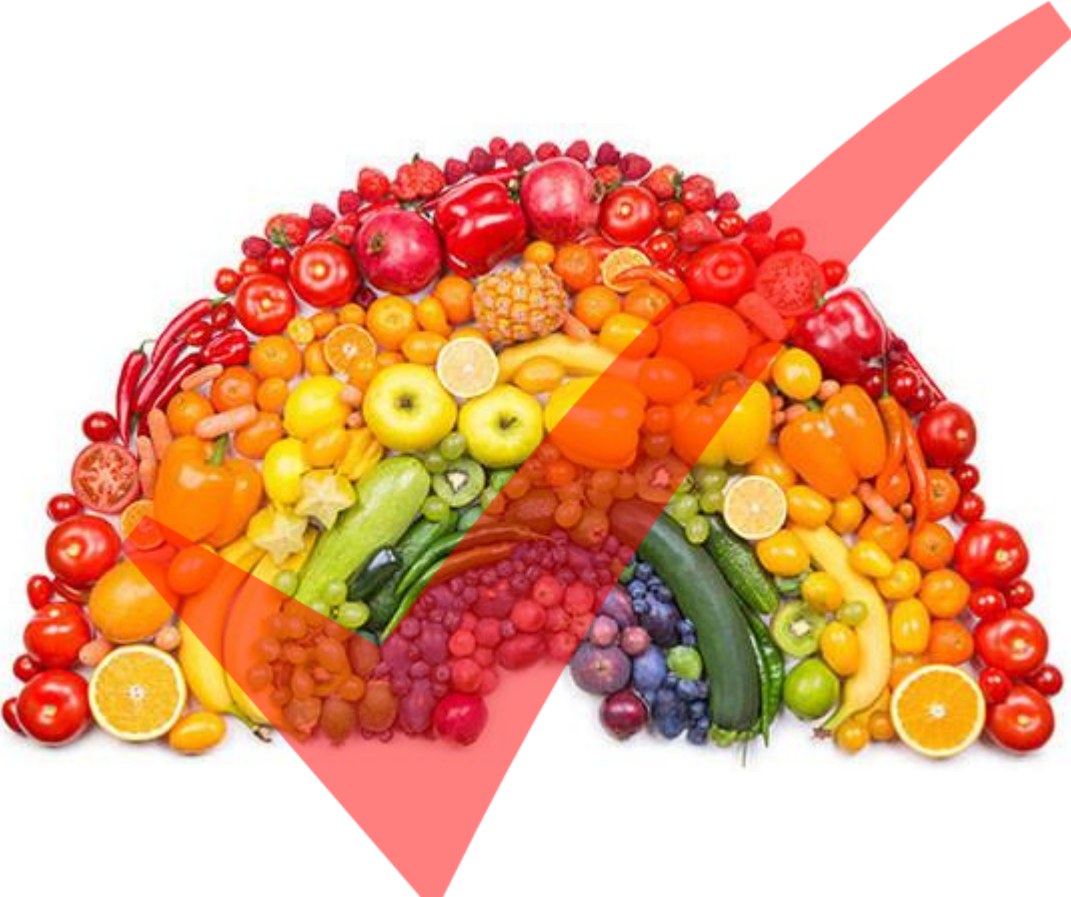


Photo Credit: Harvard Health

POLYPHENOLS

- **Flavonoids, lignans, stilbenes, and phenolic acids** found in tea, chocolate, fruits, vegetables, and spices.
 - **Green tea**, grapes, **cocoa**, berries, turmeric, orange, lemon, grapefruit, nettles, rhubarbs
- **Anti-oxidant / anti-inflammatory** eliminates reactive oxygen species (ROS)
- **Cardioprotective:** reduce risk of heart attack, stroke, and diabetes
- **Anti-lipid:** improves blood pressure and insulin resistance, lower lipids
- **Improve gut microbiome**
- **Neuroprotective:** decrease anxious and/or depressive behavior



Photo Credit: The Spruce Eats, BBC Good Food

MAGNESIUM

- Important for cellular reactions and bone structure.
- Abundant in high fiber foods like legumes, whole grains, seeds, nuts, fish, and chocolate.
- Mood stabilizing
 - One RCT showed reduction in depression and anxiety scores with supplementation.
 - However, serum magnesium has been found to be higher in patients with mood disorders than controls and is independent of psychiatric drug use.
 - Dietary intake, rather than supplementation, has been shown in epidemiological studies to be associated with lower risk of depression.
- Reduce bone loss and bone turnover in post-menopausal women with osteoporosis.
 - Higher dietary magnesium intake is associated with increased bone mineral density.
- Magnesium L-threonate improve cognitive functions in animal studies and human RCTs.



Doctor: "Sorry sir, but your body
has run out of magnesium."

Man: "0Mg."

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OMEGA 3 FATTY ACIDS



Photo Credit: BBC Good Food

- Modern diet is disproportionately heavier in in omega 6 fatty acids, which is prothrombotic and proinflammatory. Standard American Diet (SAD) Diet is approximately 20:1 Omega 6 to Omega 3.
- EPA is anti-inflammatory and helps synthesize lipid mediators.
- DHA is important for making new synapses between neurons.
- Both EPA and DHA are structural components of cell membranes.

OMEGA 3 FATTY ACIDS & COGNITION



Photo Credit: CNN

- Fish oil supplementation may modestly help older patients with self-reported cognitive decline to perform daily activities.
- Research in young and middle-aged adults(25-49 yo) shows that taking a fish oil supplement providing EPA 900mg plus DHA 360mg daily for 6 months improves some measures of cognitive function.

SUMMARY

- Our psychological and physiological states can impact our food preferences.
- Endogenous opioids are released with both stress and intake of comfort food. Overtime it can become dysregulated, leading to stress-eating.
- High glycemic index foods are associated with higher incidents of depression.
- Frequent rapid increase in blood sugar can lead to compensatory lowering of blood sugar by our autonomic nervous system, which can promote anxiety and irritability.
- Diets high in calorie and saturated fat may increase inflammation and impair cognitive function overtime.

SUMMARY

- Lower processed food intake and pay attention to added sugar in prepared food.
- Mediterranean-like dietary patterns are linked to lower cardiovascular disease risks and improve cognitive function.
- Foods high in polyphenols are neuroprotective and cardioprotective.
- Dietary magnesium is associated with lowered risk of depression and osteoporosis.
- Higher intake of omega 3 through food and supplementation reduce inflammation and improve cognition.

Thank You!

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