

Cha Chi Ming

Brain Health & Nutrition Lecture Series: Food and Mood

WU-HSUN TOM YANG, ND, LAC

OSHER CENTER FOR INTEGRATIVE HEALTH

UW DEPARTMENT OF FAMILY MEDICINE

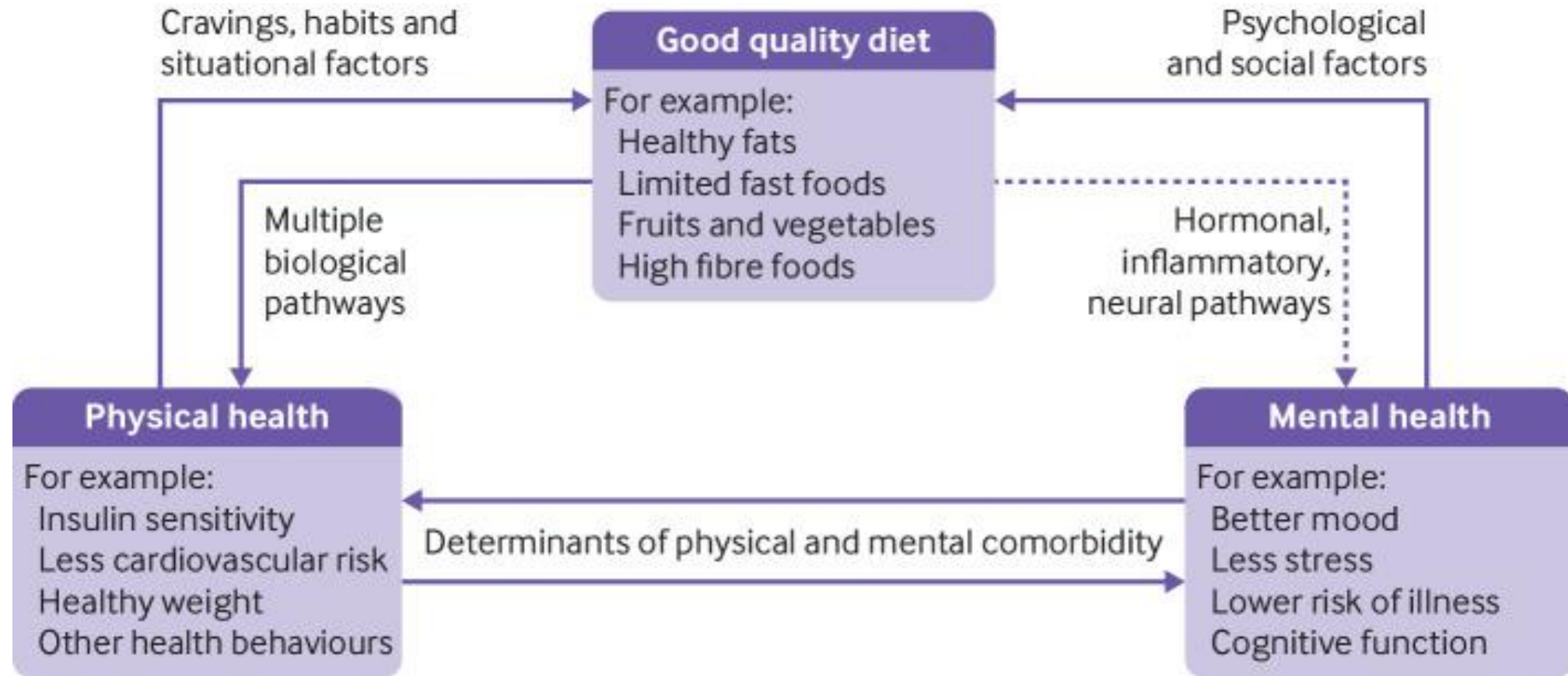
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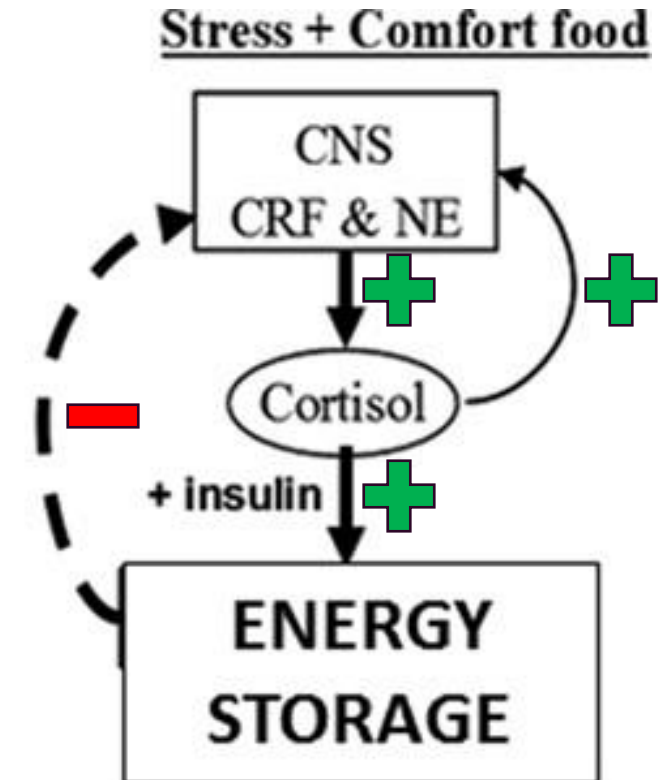
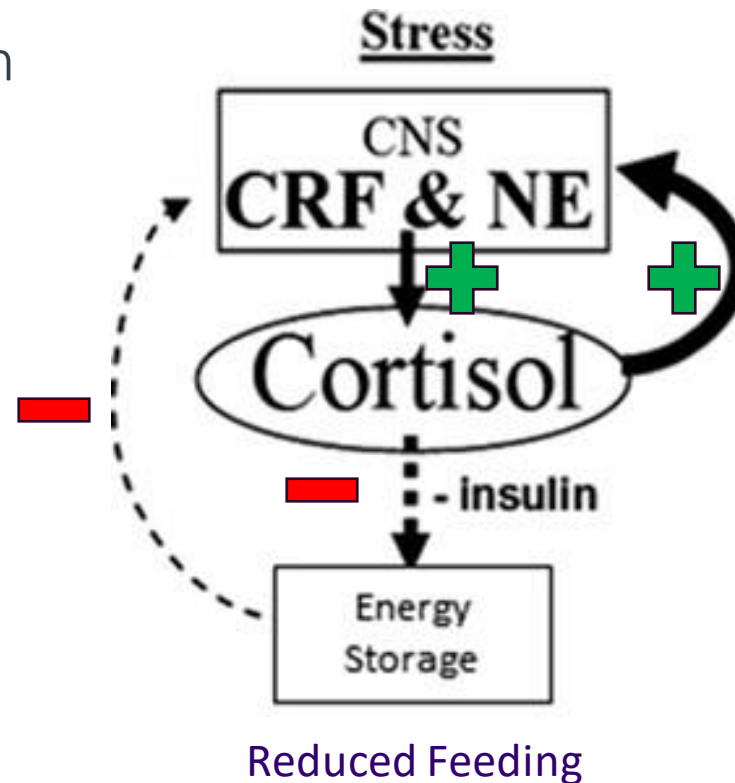
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Relationship between Diet and Health



Comfort Food and Stress

- Stress and palatable food both stimulate **endogenous opioid** release, which reduce stress response. ^{2,3}
 - Cortisol is a stress hormone.
- Repeated stimulation of our stress pathway (HPA Axis) can lead to dysregulation and contribute to increased food intake and visceral fat accumulation overtime. ^{2,3}



Blood Sugar and Depression

- Diets high in glycemic index have possible causal effect to depressive symptoms.⁴
 - Glycemic index (GI): a numeric ranking (0-100) of carbohydrate in food and its ability to raise blood glucose.
- Foods associated with **lower** incidents of depression⁴:
 - 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 depression⁴:
 - Simple carbohydrates like white bread and boiled potatoes (but not yams)
 - **Added sugars** in processed foods

Blood Sugar and Mood: Possible Mechanisms

- Following a rapid increase in blood sugar from diet, the compensatory response can **lower** plasma blood sugar enough (usually $< 70\text{mg/dL}$) to release hormones such as cortisol, adrenaline, growth hormone, and glucagon⁴.
 - Anxiety, irritability, hunger.
 - Cognitive impairment, mood and behavioral changes, fatigue.



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Blood Sugar and Mood: Possible Mechanisms

- Diets high in glycemic index is also associated with **diabetes**, which is a common comorbid condition with depression. They both share a common feature of **insulin resistance** due to chronic high insulin production.¹
- Diet **high in calorie** and **saturated fat** increase inflammation, alter gut permeability and microbiome, and blood brain barrier integrity.⁵ Together these may promote neuroinflammation and cognitive dysfunction, as well as contributing to cardiovascular and metabolic diseases.
- People with severe mental illnesses have higher level of inflammatory markers and are associated with lower diet quality (high calorie, less nutrient dense foods).¹¹

Diet and Mental Health in Specific Populations

- For the general populations, several meta-analyses and systematic reviews have shown that diet high in fruit, vegetables, fish, whole grain, low-fat dairy, and antioxidants and low in animal products are associated with reduced risk of depression or slow the onset of depression. ¹¹
- In a 2022 systematic review, 25/30 studies included indicated a positive influence of diet high in fruit and vegetable 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. ¹¹
- In a 2021 observational study of 339 university undergraduates and their dietary patterns, consumption of junk food (highly processed food, snacks, and candies) was positively associated with depression and anxiety. ¹²

Mediterranean Diet Pyramid

Mediterranean-Like

- **Whole / unprocessed foods**
Whole grains/starches, vegetables, fruits, legumes, nuts, seeds.
 - Fill ½ of plate with vegetables. Ideally varying in color.
 - Have fruit (not juice) for snacks and dessert.
- **Smaller portions of meat, fish, and sweets**
 - Meat < 3 oz. Red meat once a week
 - Fish (omega-3 fatty acids!) and seafood twice a week ([FDA](#), [Monterey Seafood Watch](#))
- **Healthy fats:** extra-virgin olive oil, avocado, olives

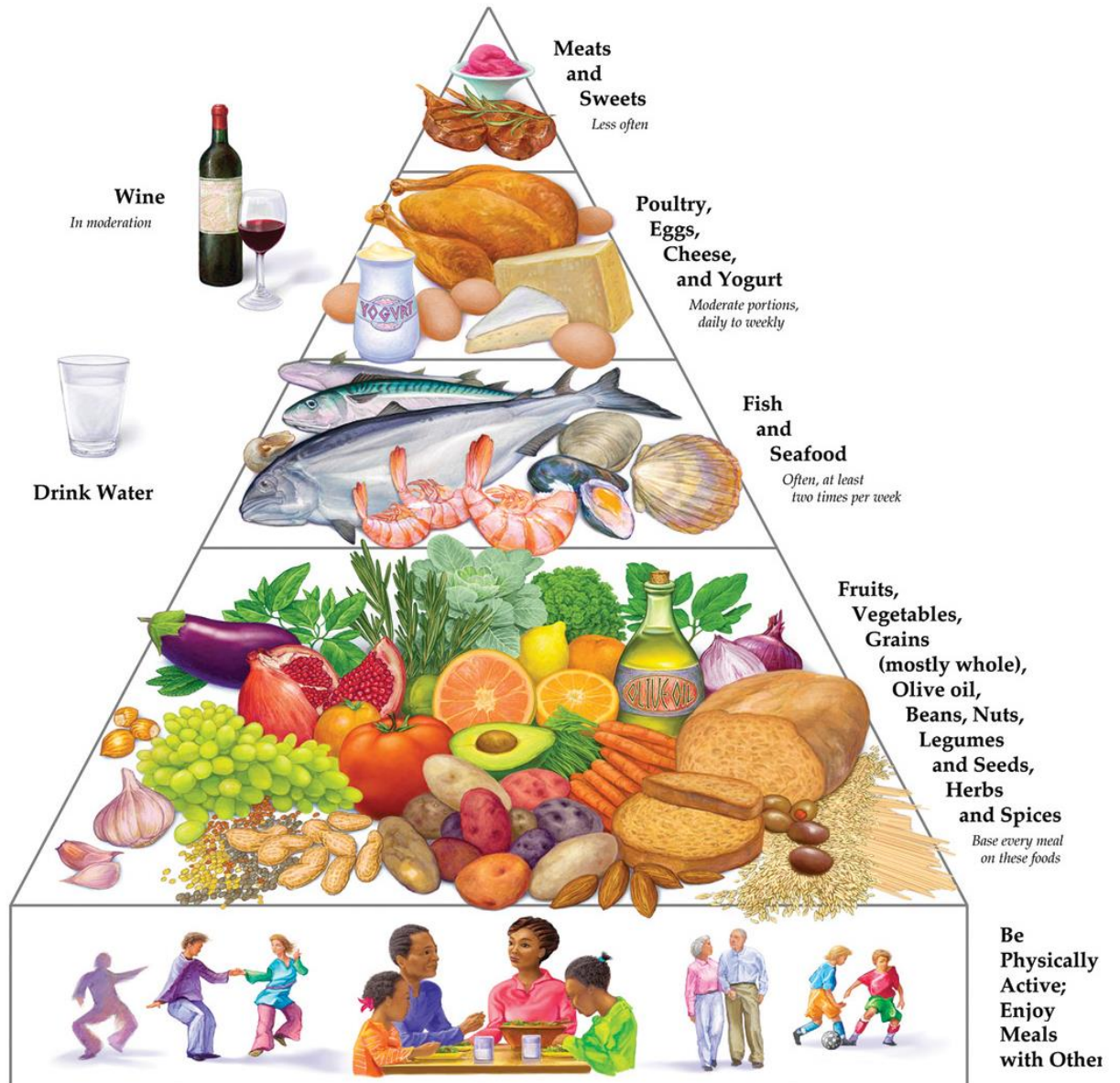


Illustration by George Middleton

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Adapted from Bastyr Center for Natural Health –
Mediterranean Diet and Lifestyle Patient Handout

Polyphenols

- Flavonoids, lignans, stilbenes, and phenolic acids found in tea, chocolate, fruits, and vegetables
 - Green tea⁹, grapes, cocoa¹⁰, berries, turmeric, orange, lemon, grapefruit, nettle, rhubarb
- **Anti-oxidant / anti-inflammatory:** eliminate reactive oxygen species (ROS)⁶
 - ROS is an oxidative byproduct of cellular energy production
- **Cardioprotective:** reduce risk of heart attack, stroke, and diabetes⁶
- **Anti-lipid:** improve blood pressure and insulin resistance, lower lipids⁶
- **Improve gut microbiome**⁶
- **Neuroprotective:** decrease anxious and/or depressive behavior⁷



TCM Perspective on Mood Disorders

- Many disease patterns in Traditional Chinese Medicine (TCM) are associated with depression and anxiety. We treat based on the **constellation of signs and symptoms**, rather than the Western diagnoses.
- Common causes of mood disorders in TCM:
 - **Emotional stress** → damages LIVER → liver qi stagnation (overtime can create heat)
 - **Overthinking** → impairs SPLEEN → imbalance between LIVER and SPLEEN → digestive issues & damp
 - **Overindulgence** → impairs YIN or YANG → heat or cold symptoms
 - **Chronic illnesses** → impairs YANG → cold symptoms & phlegm

TCM Food Therapy

- Foods that nourish each TCM Organs (LIVER, SPLEEN, HEART, KIDNEY, etc.)
 - **LIVER** = **sour** (like cranberry and citrus fruits - kumquat, tangerine, orange, Buddha hand), **aromatic** (mint, jasmine tea, rosebud tea)
 - **SPLEEN** = **bland** and **naturally sweet** (cooked grains and legumes, starchy nuts and root)
 - **HEART** = **red** colored foods (saffron, Chinese dates, figs, longan fruit, cherry)
- **Taste** of Food and ability to tonify YIN or YANG
 - **YIN** = **sour** (five flavored fruit, berries), **salty** (seafood, seaweed)
 - **YANG** = **sweet** (malt sugar, licorice), **pungent** (ginger, citrus peels, green onion, brown sugar), **bland** (cucumber, Jobs' tears, legume, Azuki beans)

TCM Food Therapy, cont.

- **Temperature of Food**

- Inherent (Natural)

- **Cooling** – barley, buckwheat, whole wheat, mung beans
 - **Warming** – oats, quinoa, chestnut, roasted grains, cinnamon, nutmeg, ginger, fennel
 - **Neutral** – rice, corn, Aduzi beans, lentil, lotus seeds, soybean

- Preparation

- **Cooling** = raw
 - **Neutral** = steamed, boiling
 - **Slightly warm** = stewed
 - **Warm** = stir-fried
 - **More warming** = baked, roasted, grilled, barbecued
 - **Heat** = deep fried

Bridging East and West

- **Fruits** – most are sweet and sour and cold to neutral in temperature, which helps with the SPLEEN and LIVER as well as cooling off the internal heat generated from long-term Qi stagnation.
 - Good source of polyphenols, Vitamin C, fiber
- **Vegetables** – most are sweet or bitter in taste and cold to neutral in temperature. Acts similarly to fruits but colder.
 - Exceptions (warm): Chinese chives, peppers, mustard greens, green onion, garlic, onion.
 - Along with liquor and deep-fried foods, these are called **FA WU**, which can aggravate inflammation and allergic responses.
 - Potatoes are good source of Vitamin B6, folate, and fiber

Bridging East and West , cont.

- **Legumes** – usually sweet in taste and neutral in temperature, which helps SPLEEN.
 - Good source of fiber, protein, **magnesium**, iron
- **Nuts** – usually sweet in taste and neutral to warm in temperature, which helps SPLEEN and KIDNEY YANG.
 - Good source of **magnesium**, manganese; Brazil nuts is also high in **selenium**
- **Seafood** – usually salty in taste and neutral to cold in temperature, which helps with KIDNEY YIN.
 - Good source of Vitamin B12 and B6 (clams, salmon, tuna), **zinc**, manganese, **selenium**

Key Points

- Our psychological and physical states can impact our food preferences.
- Endogenous opioids is released with both stress and intake of comfort food. Overtime it can become dysregulated, leading to stress-eating.
- High glycemic index foods over long periods of time are associated with higher incidents of depression.
- Compensatory lowering of blood sugar after a rapid increase in blood sugar after a meal can release hormones that can lead to anxiety and irritability.
- Inflammation from diets high in calorie and saturated fat can impair our cognitive function.

Key Points

- Pay attention to added sugars in prepared food.
- Follow dietary patterns similar to a Mediterranean diet.
- Foods high in polyphenols are neuroprotective and improve overall cardiovascular and metabolic outcomes.
- TCM food therapy is individualized, rather than based on Western diagnoses. Foods that nourish the TCM organs SPLEEN and LIVER are helpful in treating anxiety and depression.
- Seek professional guidance because how mood affect dietary choices is often multi-factorial – dieticians, TCM practitioners, integrative health practitioners.

QUESTIONS?



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