

Soil Health = Human Health

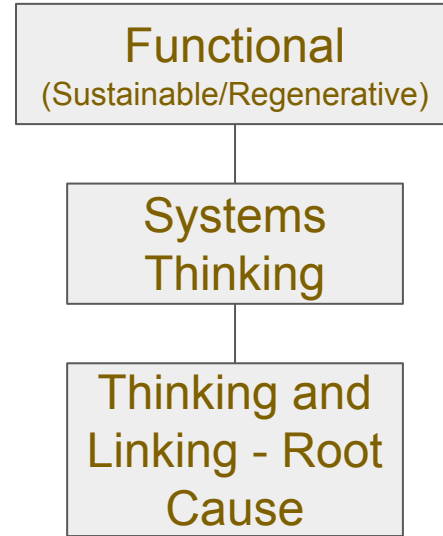
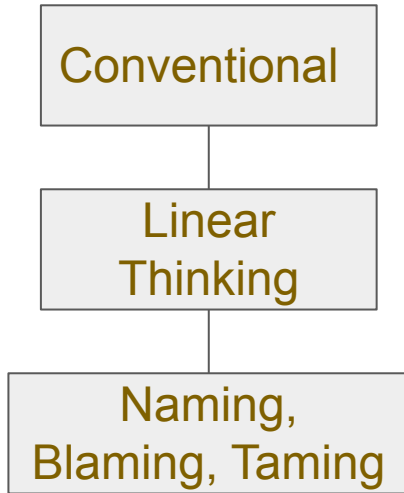
Jolene Carlson
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THE WHAT?

Soil + Gut Connection

LANGUAGE OF SOIL AND HEALTH



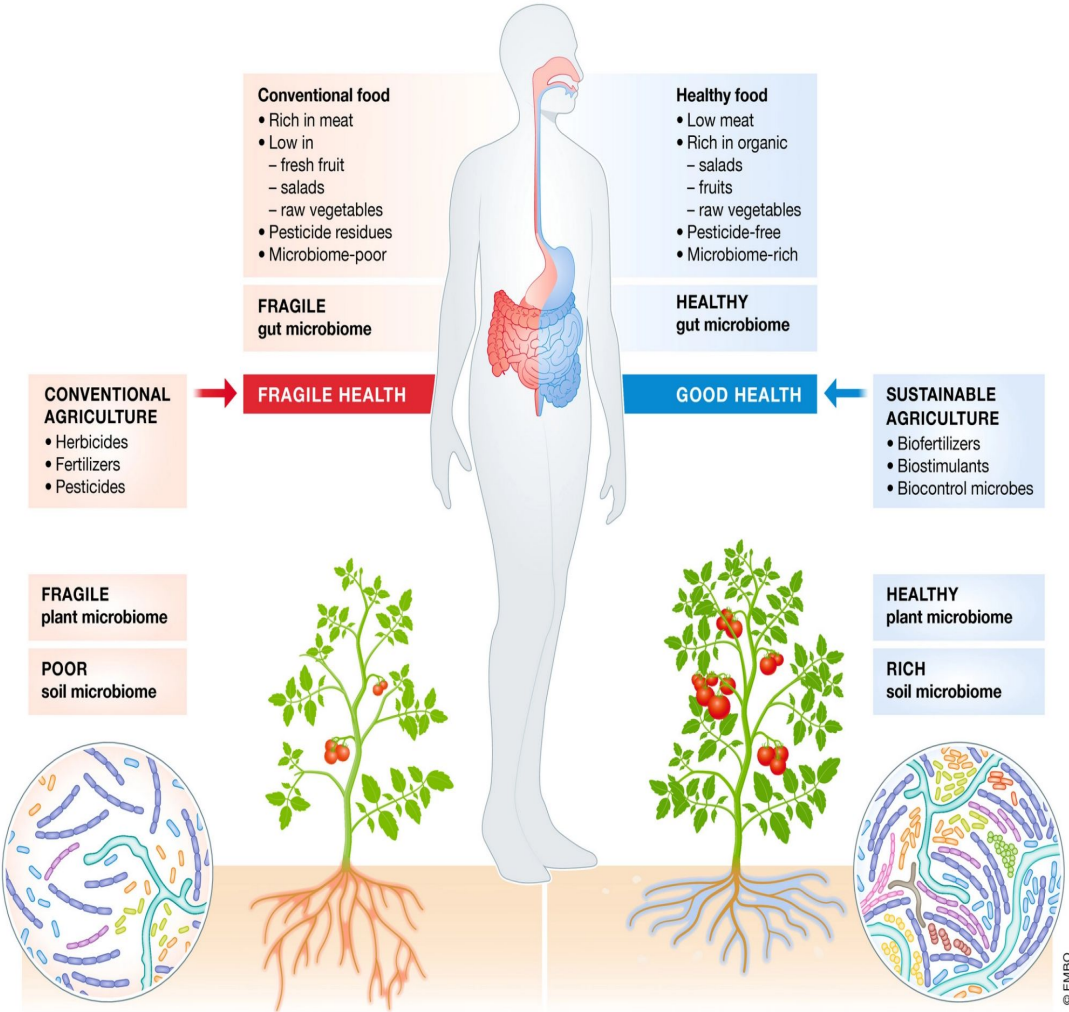
SOIL = NUTRIENTS

CONVENTIONAL = GUT DYSBIOSIS

- Toxins (inputs)
- Nutrient Poor = nutrients processed out
- Low diversity = nutrient deficiencies

SUSTAINABLE = GUT DIVERSITY

- Nutrient rich
- Toxin Free
- Increased diversity = nutrient dense



WHAT THE RESEARCH SAYS ...

Review

> *Microorganisms*. 2019 Aug 23;7(9):287. doi: 10.3390/microorganisms7090287.

Does Soil Contribute to the Human Gut Microbiome?

Winfried E H Blum ¹, Sophie Zechmeister-Boltenstern ¹, Katharina M Keiblinger ²

Affiliations + expand

PMID: 31450753 PMCID: PMC6780873 DOI: 10.3390/microorganisms7090287

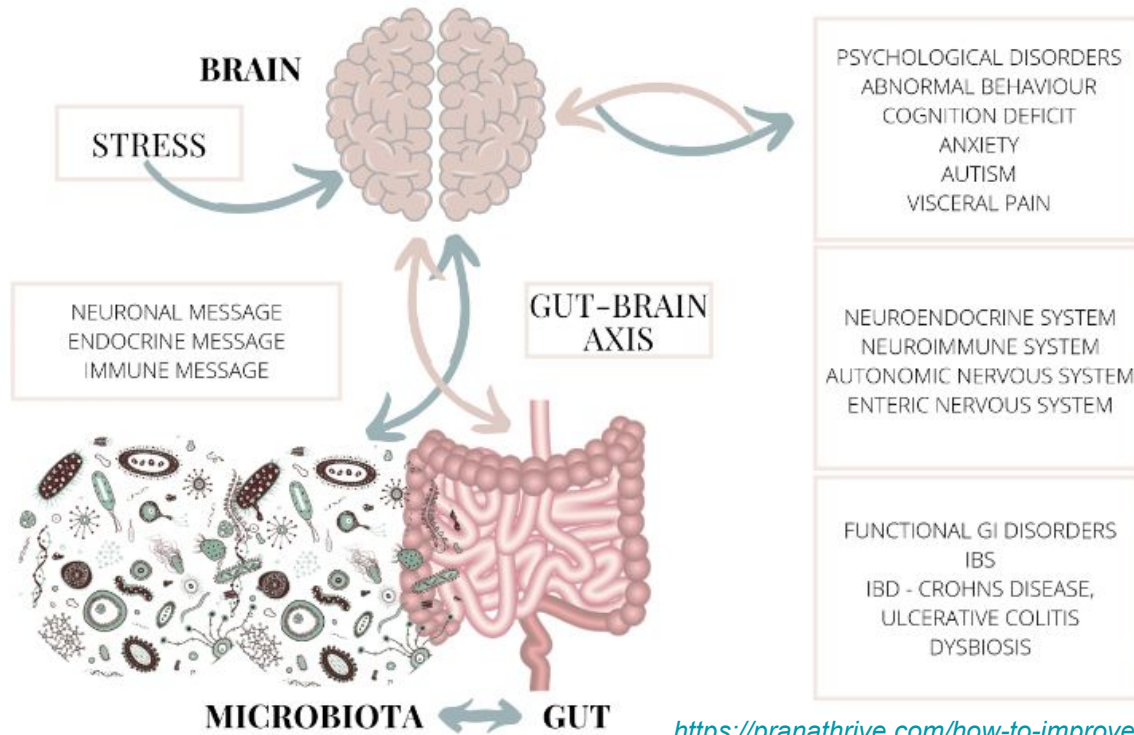
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A [recent scientific study](#) highlighted that the soil and the human gut contain approximately the same number of active microorganisms (Approximately 100 trillion micro-organisms, most of them bacteria, but also viruses, fungi, and protozoa), with the microbiome diversity within the human gut having decreased dramatically with the modern lifestyles. They found that the microbiota in our environment influence the human intestine microbiome,



GUT-BRAIN CONNECTION

"Stress is hugely significant in the development and chronic nature of many gut-related conditions but unfortunately it is one of many potential causes of an unhealthy gut."



<https://pranathrive.com/how-to-improve-gut-health/>

HUMAN GUT = SECOND BRAIN

- ❖ “The probiotic bacteria, called *Lactobacillus rhamnosus*, contains a neurotransmitter called GABA that helps regulate brain activity and can calm anxiety.”
- ❖ “Research shows that altering bacteria in the gut through specific diets may help to treat stress-related and neurodevelopmental disorders, including autism and hyperactivity.”
- ❖ “It has its own nervous system known in scientific literature as the enteric nervous system, or ENS, and it is often referred to in the media as the ‘second brain’. This second brain is made up of 50 to 100 million nerve cells, as many as are contained in your spinal cord.”
- ❖ “95% of the body serotonin is stored in the gut. Serotonin is a signaling molecule that plays a crucial role within the gut-brain axis, and it plays a crucial role in functions such as sleep, appetite, pain sensitivity, mood, and overall well-being.”
- ❖ “Nearly 15% of the US population suffers from a range of aberrant gut reactions, including irritable bowel syndrome (IBS), chronic constipation, indigestion, and functional heartburn, which all fall into the category of brain-gut disorders.”

RESEARCH, RESEARCH and more RESEARCH!

Food for thought: The role of nutrition in the microbiota-gut-brain axis

Clara Seira Orlich ^{a, d, 1}, Rusini C. Robertson ^{b, c, d, 1}, Catherine Stanton ^{c, d}, John F. Cryan ^{d, c}, Timothy G. Dinan ^{a, d}

The Role of Nutrition and the Gut-Brain Axis in Psychiatry: A Review of the Literature

Wolke S¹, Rogers S², Li J³, Lohman E⁴, Jackson E⁵, Hahn K⁶, Beggs S⁷, Bickel P⁸, Hester S⁹, Shenghui Z¹⁰

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[ABSTRACT](#) [FULLTEXT](#) [PDF](#) [REFERENCES](#)

Losing weight for a better health: Role for the gut microbiota

María Carlota Dao ^{a, b, c}, Amandine Everard ^d, Karine Clément ^{a, b, c}, Patrice D. Cani ^d

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Microbiota-Gut-Brain Axis: Modulator of Host Metabolism and Appetite

Marcel van de Wouw, Harriët Schellekens, Timothy G Dinan, John F Cryan

The Journal of Nutrition, Volume 147, Issue 5, May 2017, Pages 727–745,
<https://doi.org/10.3945/jn.116.240481>

Published: 29 March 2017 **Article history**

The diet-microbiome tango: how nutrients lead the gut brain axis

Gili Ezra-Nevo ¹, Sílvia F Henriques ¹, Carlos Ribeiro ²

[Full Text](#) | [Dissertations & Theses](#)

Diet, Prebiotics, and Probiotics: Effects on Gut Microbiota and Metabolic Disorders

[Aljaily, Thamer](#). South Dakota State University, ProQuest Dissertations Publishing, 2019. 27666038.



NUTRIENT DENSITY - VITAMINS AND MINERALS

Healthy soils for healthy plants for healthy humans

How beneficial microbes in the soil, food and gut are interconnected and how agriculture can contribute to human health

Heribert Hirt  

[Author Information](#)

EMBO Reports (2020) 21: e51069 | <https://doi.org/10.15252/embr.202051069>

- Humans can only synthesize 11 of the 20 amino acids themselves -
- Must rely on food for the other 9 as well as all the 13 essential vitamins and over 100 minerals
- Most amino acids are found in the guts of healthy ruminants
- Vitamin B12 can ONLY be made from microbes
- Microbes make primary metabolites (amino acids, vitamins, and minerals)
- Microbes make secondary metabolites (antibiotics, immunosuppressants, anti-inflammatory)
- Healthy plants make flavonoids, PUFA (omega-3 fats), CLA (conjugated linoleic acid), L-carnitine, choline, and polyphenols



Discussion?

In what ways are soil and the gut similar?

**How does the nutrient density in soil affect the nutrients
in food?**

THE WHY?

Chronic Illness and Disease

OVERFED and UNDERNOURISHED

CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP)

CHRONIC DISEASES IN AMERICA

6 IN 10

Adults in the US
have a **chronic disease**



4 IN 10

Adults in the US
have **two or more**

THE LEADING CAUSES OF DEATH AND DISABILITY
and Leading Drivers of the Nation's **\$4.1 Trillion** in Annual Health Care Costs



SOME EXAMPLES OF CHRONIC ILLNESS (A PARTIAL LISTING)

AIDS
ALLERGIES TO ENVIRONMENTAL IRRITANTS AND
FOOD
AMPUTATION
AMYOTROPHIC LATERAL SCLEROSIS (ALS)
ARTHRITIS (AND RHEUMATOID ARTHRITIS)
ASTHMA
CANCER
CARPAL TUNNEL SYNDROME
CHRONIC FATIGUE AND IMMUNE DYSFUNCTION
SYNDROME (CFIDS)
COLITIS
CROHN'S DISEASE
CYSTIC FIBROSIS
DEGENERATIVE DISK DISEASE
DEMYELINATING DISORDERS
DIABETES
EMPHYSEMA (COPD ñ CHRONIC OBSTRUCTIVE
PULMONARY DISEASE)
ENDOMETRIOSIS
FIBROMYALGIA
GULF WAR SYNDROME
HEADACHES (AND MIGRAINE HEADACHES)
HEARING LOSS
HEART DISEASE
HEPATITIS
ILEITIS / COLITIS

IRRITABLE BOWEL SYNDROME
KIDNEY DISEASE
LUNG DISORDERS
LUPUS (SYSTEMIC LUPUS ERYTHEMATOSUS)
LYME DISEASE
MULTIPLE SCLEROSIS
MUSCULAR DYSTROPHY
PARKINSON'S DISEASE
SCLERODOMA
SPINAL CORD INJURY AND PAIN
STROKE
VISUAL DEFICIENCY OR BLINDNESS

RECOMMENDED READING

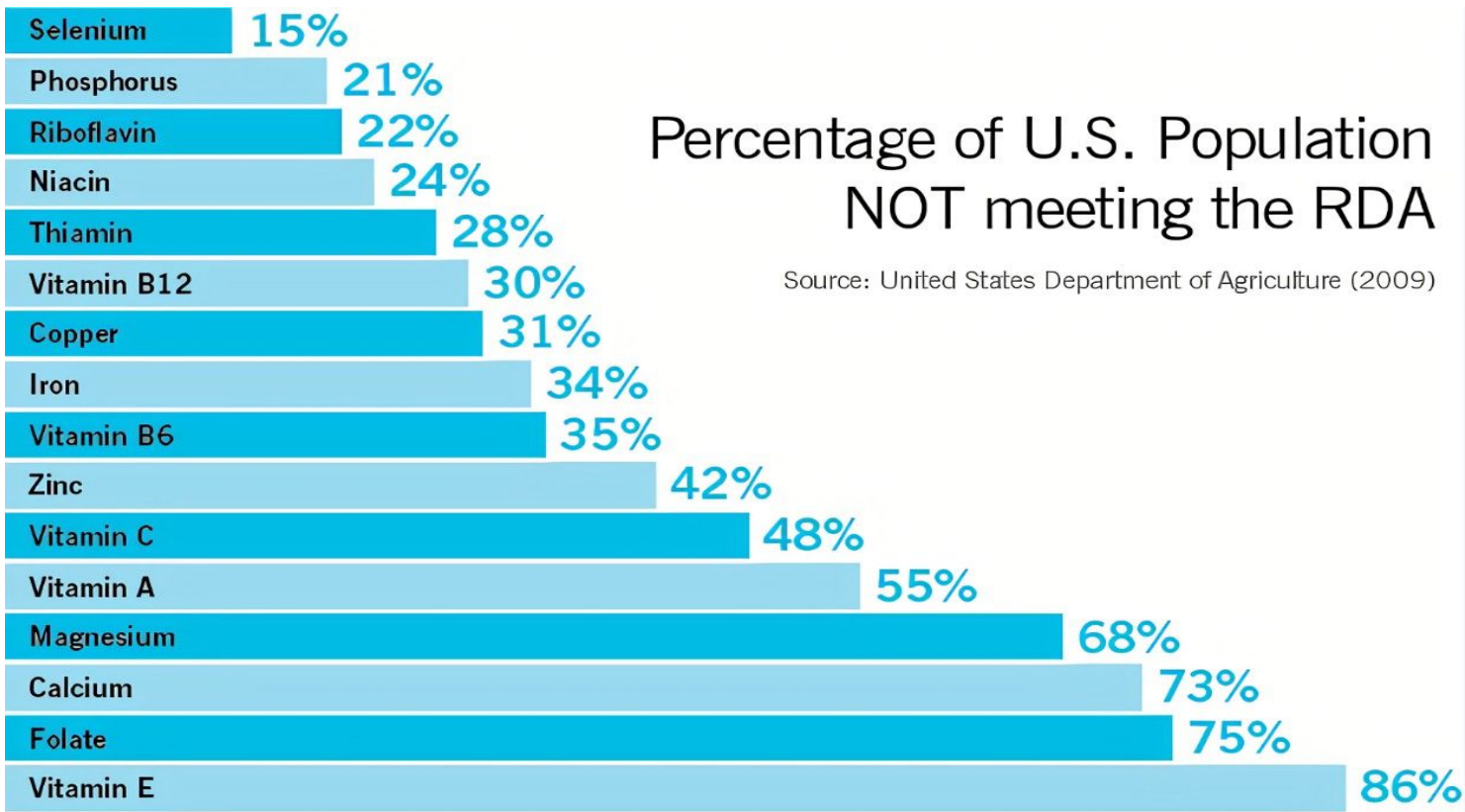
Fennell, Patricia A. *The Chronic Illness Workbook*. New Harbinger Publications, 2001. ISBN: 1-57224-264-7.

LeMaistre, JoAnn. *After the Diagnosis ñ From Crisis to Personal Renewal for Patients with Chronic Illness*. Ulysses Press, 1995. ISBN: 1-56975-046-7.

Register, Cheri. *The Chronic Illness Experience*. Hazelden, 1999. ISBN: 1-56838-346-0.

Wells, Susan M. *A Delicate Balance: Living Successfully With Chronic Illness*. Perseus Publishing, 2000. ISBN: 0-7382-0323-8.

VITAMIN AND MINERAL DEFICIENCIES



Source: United States Department of Agriculture (2009)

MINERAL DEFICIENCIES

- Mineral deficiencies negatively affect billions of individuals worldwide
- Most prevalent and largest negative impact to human health are IRON, ZINC, and IODINE
- Other concerning deficiencies MAGNESIUM, SELENIUM, and FLUORINE
- LEAD is the most important environmental contaminant affecting brain development



Discussion?

How does the gut affect the brain?

Give some examples of chronic diseases in teenagers?

THE HOW?

Heal the Soil, Heal the Gut, Heal the Person!

FEED THE SOIL - Nutrient Dense

- Maximize Soil Building Practices
 - Increase Diversity - stop MONOCROPPING
 - Keep a living root - PERENNIALS
 - Soil Cover -Armor - SOIL SHOULD NEVER BE NAKED
 - Integrate Animals - FEED THE SOIL WITH ANIMALS
 - Minimize Disturbance - DON'T DISTURB THE BIOLOGY OF THE SOIL



FEED YOUR GUT - Nutrient Dense

- **Eat Real Food** - comes from a stem or something with a face
- Eat in Balance - **PROTEIN + VEGETABLES + FATS**
- Eat **FERMENTED** foods and/or BITTERS
- Get Dirty and Touch everything
- **Increase Diversity** of Real Food
 - Vegetables: eat the rainbow
 - Proteins: wild game and varied species
 - Fats: saturated, poly, mono, and unsaturated

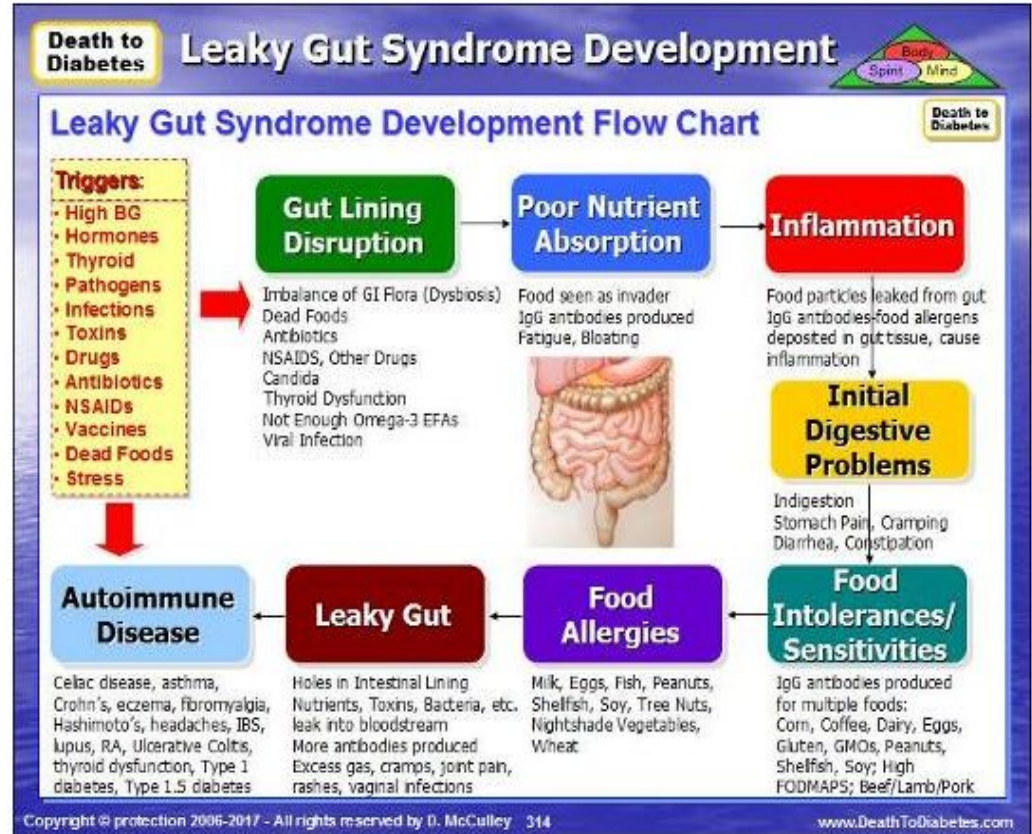
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WHAT IS A LEAKY GUT?

Intestinal Lining

- Healthy intestinal lining creates tight barrier to bloodstream
- When unhealthy cracks or holes (leaky) are formed (leaks into bloodstream and tissues) causing inflammation
- Inflammation causes changes in gut microbiome
- Inflammation and modifications to gut microbiome are directly correlated to chronic diseases and autoimmune disorders



RECOGNIZING A LEAKY GUT - GUT DYSBIOSIS

SYMPTOMS OF POOR GUT HEALTH

- BLOATING
- CONSTIPATION & DIARRHEA
- FATIGUE
- JOINT PAIN & ARTHRITIS
- ROSACEA & ACNE
- PSORIASIS & ECZEMA
- THYROID ISSUES
- WEIGHT GAIN
- AUTOIMMUNE ISSUES
- FOOD SENSITIVITIES
- HEADACHES
- ALLERGIES

<https://mealpreponflea.com/guide-to-gut-health/>



HOW TO HEAL THE GUT

**WEED,
SEED,
And
FEED**



HOW DO YOU HEAL "LEAKY GUT"?

- 1 REMOVE**
(Food sensitivities and gut infections)
- 2 REPLACE**
(Enzymes, HCL, bile)
- 3 REESTABLISH OR REINOCULATE**
(Probiotics and prebiotics)
- 4 REPAIR**
(Glutamine, zinc, omega-3s, and turmeric)
- 5 REBALANCE**
(Manage stress, sleep, and exercise)

DR. STEPHANIE GRAY



**YOUR LONGEVITY
BLUEPRINT**

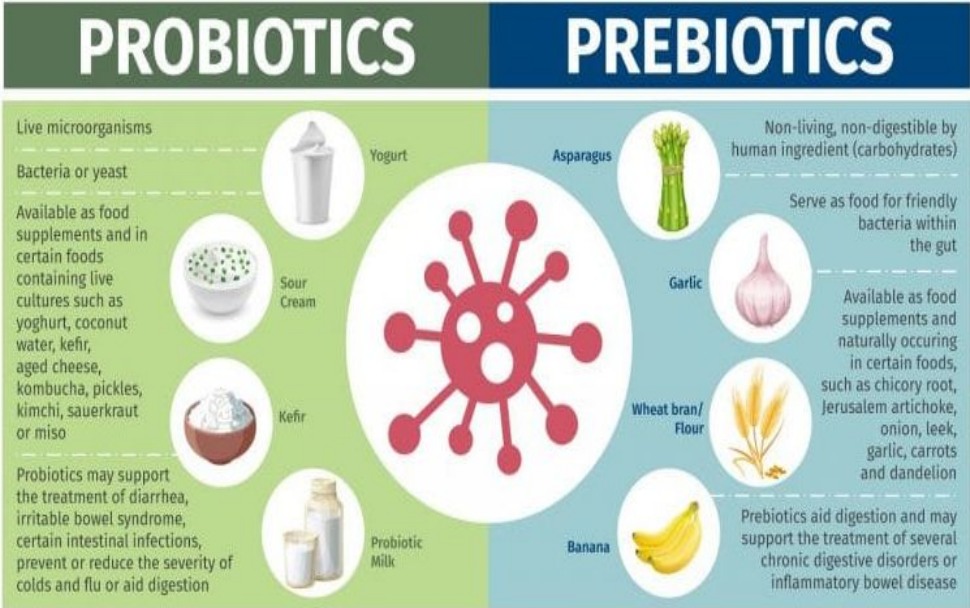
PREBIOTICS and PROBIOTICS - FUEL FOR THE GUT

Prebiotics: Food for Probiotics

- ❖ Fiber
- ❖ Phytonutrients

Probiotics: Living Organisms that Manage Metabolism

- ❖ Fermented Food
- ❖ Bacteria/Yeast
- ❖ Live Cultures
- ❖ Lactobacillus and Bifidobacteria



thedempsterclinic.com



FIBER - NATURE'S PREBIOTIC

RDA

Men: 30-40 g/day

Women: 20-35 g/day

Ideal: 50+g/day

“A 2017 study found that the importance of fiber is intimately tied with the importance of our gut microbes. A proper fiber diet literally feeds and makes these bacteria thrive”.

“A living, walking example of the great connection between fiber, intestinal bacteria, and health are the Hazda, a Tanzanian tribe that's one of the last remaining hunter-gatherer communities in the world. They eat a spectacular *100 grams* of fiber a day...’

List of High Fiber Foods



VEGETABLES	AMOUNT	FIBER (grams)
Avocado (fruit)	1 medium	11.84
Beets, cooked	1 cup	2.85
Beet greens	1 cup	4.2
Bok choy, cooked	1 cup	2.76
Broccoli, cooked	1 cup	4.5
Brussels sprouts	1 cup	2.84
Cabbage, cooked	1 cup	4.2
Carrot	1 medium	2
Carrot, cooked	1 cup	5.22
Cauliflower, cooked	1 cup	3.43
Cole slaw	1 cup	4
Collard greens, cooked	1 cup	2.58
Corn, sweet	1 cup	4.66
Green beans	1 cup	3.95
Celery	1 stalk	1.02
Kale, cooked	1 cup	7.2
Onions, raw	1 cup	2.88
Peas, cooked	1 cup	8.84
Peppers, sweet	1 cup	2.62
Pop corn, air-popped	1 cup	3.6
Potato, baked w/skin	1 medium	4.8
Spinach, cooked	1 cup	4.32
Summer squash, cooked	1 cup	2.52
Sweet potato, cooked	1 cup	5.94
Swiss chard, cooked	1 cup	3.68
Tomato	1 medium	1
Winter squash, cooked	1 cup	5.74
Zucchini, cooked	1 cup	2.63

BEANS, NUTS, SEEDS	AMOUNT	FIBER (grams)
Almonds	1 oz	4.22
Black beans, cooked	1 cup	14.92
Cashews	1 oz	1
Flax seeds	3 tbs	6.97
Garbanzo beans, cooked	1 cup	5.8
Kidney beans, cooked	1 cup	13.33
Lentils, red cooked	1 cup	15.64
Lima beans, cooked	1 cup	13.16
Peanuts	1 oz	2.3
Pistachio nuts	1 oz	3.1
Pumpkin seeds	1/4 cup	4.12
Soybeans, cooked	1 cup	7.62
Sunflower seeds	1/4 cup	3
Walnuts	1 oz	3.08

FRUIT	AMOUNT	FIBER (grams)
Apples with skin	1 medium	5
Apricot	3 medium	0.98
Apricots, dried	5 pieces	2.89
Banana	1 medium	3.52
Blueberries	1 cup	4.18
Cantaloupe, cubes	1 cup	1.28
Figs, dried	2 medium	3.74
Grapefruit	1/2 medium	6.12
Orange, navel	1 medium	3.4
Peach	1 medium	2
Peaches, dried	3 pieces	3.18
Pear	1 medium	5.08
Plum	1 medium	1
Raisins	1.5 oz box	1.6
Raspberries	1 cup	8.34
Strawberries	1 cup	3.98



This list of high fiber foods is vitally important to your health and makes it easy to increase the fiber in your diet. Remember, you're aiming for 30 to 40 grams a day for optimum health.

High fiber foods can help you reduce your risk of constipation, hemorrhoids, high cholesterol, high blood sugar, obesity, colon cancer, diabetes and heart disease. Wow! Choose wisely so you can look and feel your very best.

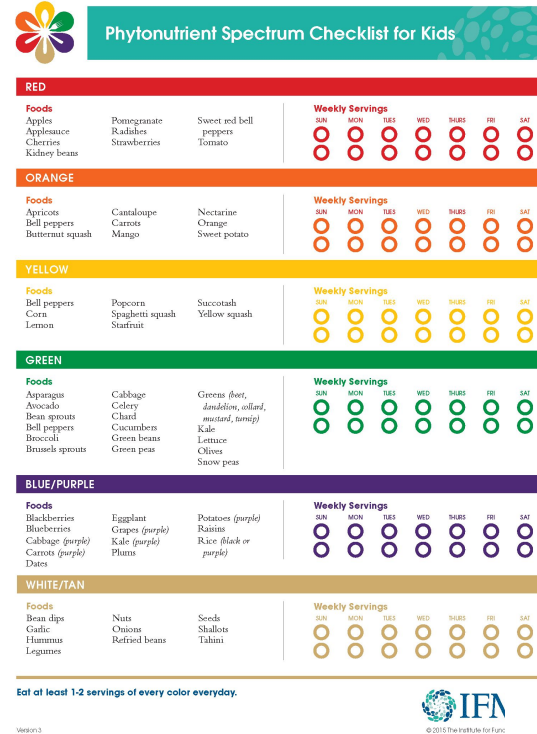
Common Sense Health.com
... a dose of reality to boost your vitality!

PHYTONUTRIENTS - EAT THE RAINBOW

“A combination of phytonutrients and prebiotic fibre improved gut bacterial profiles and reduced bloating, gas, and abdominal pain.”

“Phytonutrients can also have a big impact on gut bacteria due to their prebiotic-like effects, despite being consumed in relatively small amounts when compared to prebiotic fibre.”

- ◆ Use The Chart
- ◆ Try to Eat at least 5 different fruits each week
- ◆ Try to eat at least 10 different vegetables each week



Discussion?

Give some examples of a breakfast that can be nutrient dense (proteins, fats, vegetables)?

What is one small daily change you can make to help your gut health?

Tips for Health

Breakfast Balance <i>First thing you put in your mouth determines how you eat the rest of the day</i>	One Healthy Change <i>Every good choice matters, just start somewhere</i>
<ul style="list-style-type: none">● Coffee with Heavy Cream or Whole Milk + a little honey for sweet● More Fruit● Smoothies (Fat + Veg + Fruits)● Cheese● Nut Butters (almond, cashew)● Cottage Cheese (+ fruit or + tomatoes, cucumbers)● Eggs + Meat● Hummus + Veggies● Leftovers (meat + veggies)● Eggs (Egg Sandwiches - fried eggs + sausage patties as the bun + avocado)● Egg Stir Fry (in butter)● Breakfast can be ANY food, no rules on eating only “breakfast items”	<ul style="list-style-type: none">● Master Breakfast● Eat more vegetables (try for veggies at each meal)● Fruit and Veggies offering● Nuts and Seeds (make a trail mix) - dark chocolate chips, coconut flakes, nuts, seeds● Grow edibles - lettuce, herbs● Don't drink sugar in the morning● Drink more water● Add a handful of greens to everything you eat● Try a new fruit each week● Try a new vegetable each week● Try to make your plate as COLORFUL as possible● Add HERBS and/or SPICES to every meal

QUESTIONS?

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