



The Surprising Ways Nutrition Optimizes Behavior, Mood and Development



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What We Know About the Biology of Anxiety and Depression

- Inflammation at the cellular level is a cause of mood disorders

Studies find a low inflammation diet may help depression/anxiety

- The type of bacteria in the intestines affects how you feel

Good bacteria produce >30 mood shifting chemicals including 90% of serotonin and 50% of dopamine

- Research finds significantly picky eaters had twice the level of mental health diagnoses

Nutrient deficiencies alter mood and cognitive abilities

- Anxiety and depression increase during allergy seasons



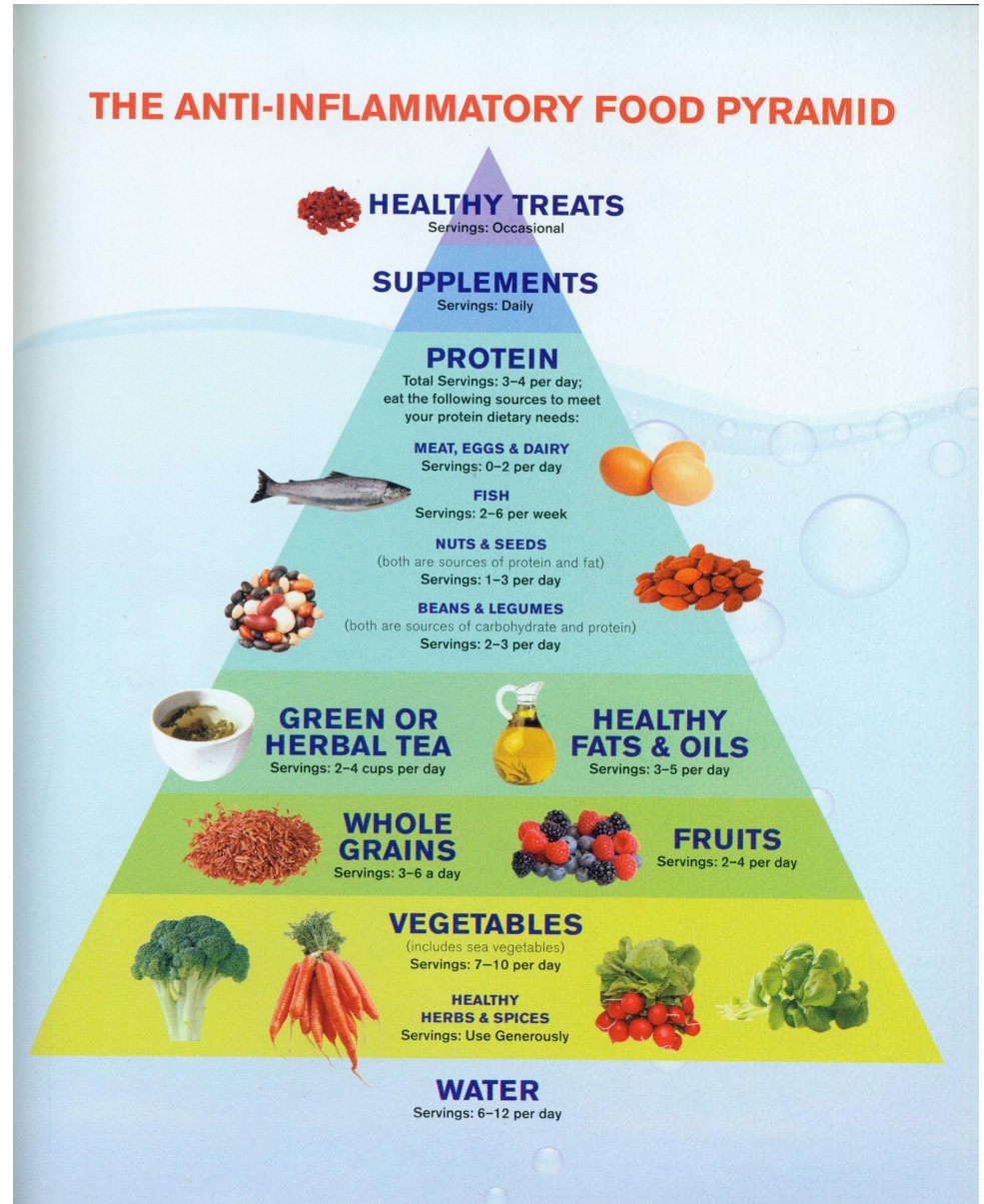
Inflammation and the Brain

- Happens when your immune system jumps into action and/or there is long-term exposure to hormones released in response to stress, injuries, chemical exposure, or poor diet
- Chronic inflammation happens when the healing process is not complete and swelling stays
- Found in developmental issues such as autism



The Anti-Inflammatory Diet

- 5 + servings of vegetables/fruits
- One dark green vegetable
- 1 oz. nuts
- Whole grains
- Olive or avocado oil
- Include fish and eggs
- Limit refined carbohydrates, fried foods, processed meats, sugary drinks and alcohol



The SMILES Trial to Ease Major Depression

- 32% of participants had depression remission after 12 week program
- Diet increased levels of vegetables, fruits, fish, whole grains, legumes and nuts
- Foods reduced to \leq 3x/week: sweets, refined cereals, fast food, sugary drinks, fried food, processed meats, alcohol
- Reported in Jan 2017 BMC Medicine



Two Types of Nutrition Intervention

1. Remove/Reduce Irritants and Junk



2. Add Missing and Therapeutic Nutrients



Nutrient Deficiencies Are Linked To:

- Immune deficiency
- Growth retardation
- Poor wound healing
- Muscle weakness
- Increased cancer risk
- Cognitive decline/Fuzzy thinking
- Fatigue
- Increased inflammation
- Mood disorders
- Endocrine issues
- Macular degeneration/blindness
- Bone loss
- Behavioral issues....among other things.



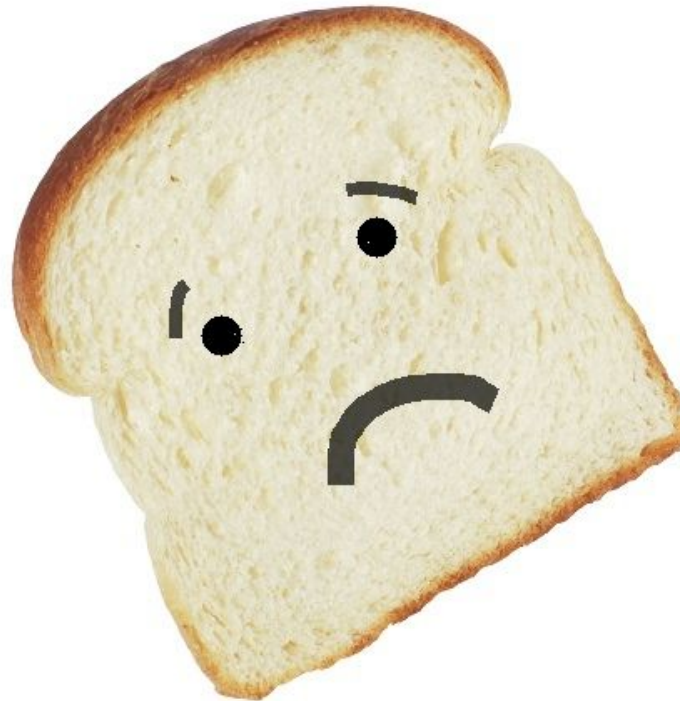
Nutrient Deficiencies and Behavior

- USC study found children with low levels of iron, zinc, B vitamins and protein were significantly (41%) more aggressive at age 8 and more violent and antisocial at age 17 (51%)
- Low levels of vitamin B6 and Magnesium found in those diagnosed with ADHD

Schwalfenberg and Genius. *The importance of magnesium in clinical healthcare*, 2017

Irritants to Avoid

- Sugar/Processed Foods
- Food sensitivities and allergens
- Herbicides/Pesticides



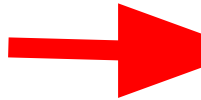
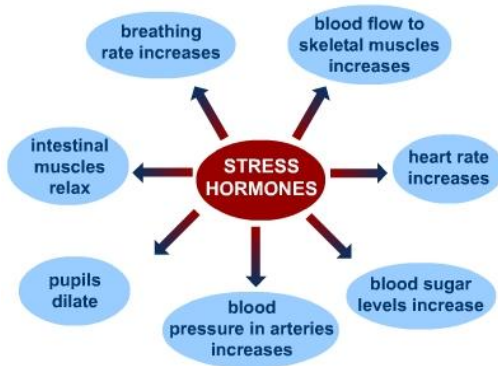
Does High Sugar Consumption Affect Behavior?

- Reducing sugar consumption in a juvenile detention centers lowered disciplinary actions 47% over a year
- Significantly lower levels of antisocial behavior were found when sugar was reduced in over 1,300 detained juveniles
- Studies done by SJ Schoenthaler
Published in the International Journal of Biosocial Research, Vol 5; Issues 1 & 2: 1983.



People Under Stress Crave Sugar and Carbs!

- Increasing complex carbs like beans and vegetables work best but fast burning carbohydrates (like sugar) reduce stress hormones immediately.*
- Mild elevations in blood sugar over time cause blood sugar to bind with proteins (glycation). Glycated proteins dramatically increase production of inflammatory chemicals



*

Research of Mary Dallman, U. of Ca. San Francisco

How Much Sugar is Too Much?

- World Health Organization and American Heart Association recommends no more than 6 tsp./day (There are 4 grams of sugar in a teaspoon.)
- Industry pressure discourages groups/government from making specific recommendations
- Average consumption in US is 15-18 tsp/day
- Drinking one soda a day (about 10 tsp in a cola) increases diabetes risk by 29%



Allergies vs. Reactions

- Mediated by histamine



- Reactions within 2 hours
- Involves itching and swelling
- IgE levels high in the blood
- Tested with scratch or RAST blood test

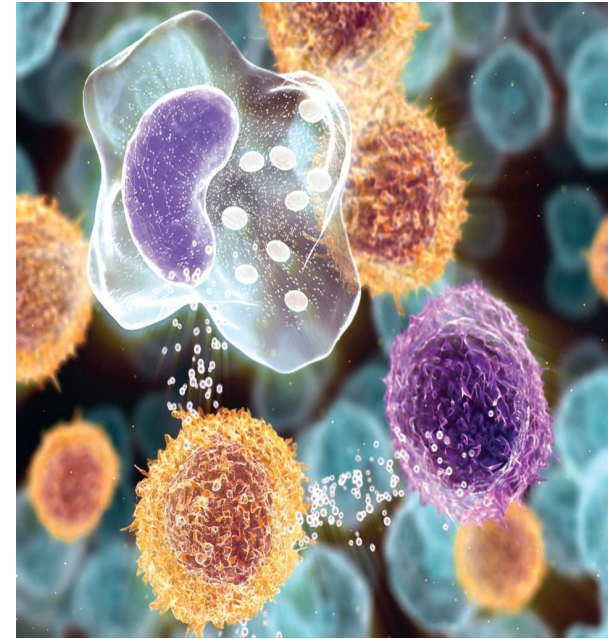
- Can be hours or days later
- Wide variety of symptoms including headaches, stomach aches, mood changes, fuzzy thinking
- Mediated by a variety of known and unknown reactions
- Best test is elimination

How the Immune System Talks to the Nervous System

- Cells in the nervous system have receptor sites for messenger molecules (cytokines) reacting to antigens
- IgE (or traditional allergy) reactions represent half or less of possible reactions
- Individual responses depend on genetic tendencies, nutritional status and other factors

Cytokines

- Signaling proteins/glycoproteins that help cellular communication
- Secreted by immune cells (like T-helper cells) when they encounter a pathogen/allergen to recruit more cells and increase immune response
- Bind to cell surface receptors
- Can up/down regulate genes
- Names like IFN- γ , TGF- β , IL-4, IL10



Falling Apart in the Spring

- Depression and suicide increase in spring
- 2/3 kids with ADD/PDD deteriorate in spring
- Half the kids who regressed did not have traditional nasal symptoms



Why are we becoming more reactive?

- GMOs?
- Pollution?
- Global climate change?
- Poor diet?
- Reduced microbiome diversity?



GMOs and Reactions

- Genetically modified organisms (GMOs) have altered protein structures that are foreign to the immune system.
- Animals fed GMO food become more reactive to other foods
- Genetically altered soy use became widespread in 1996
- Peanut allergies increased by 20% each year between 1997 and 2005
- Soy/peanuts are in same food family (legumes)



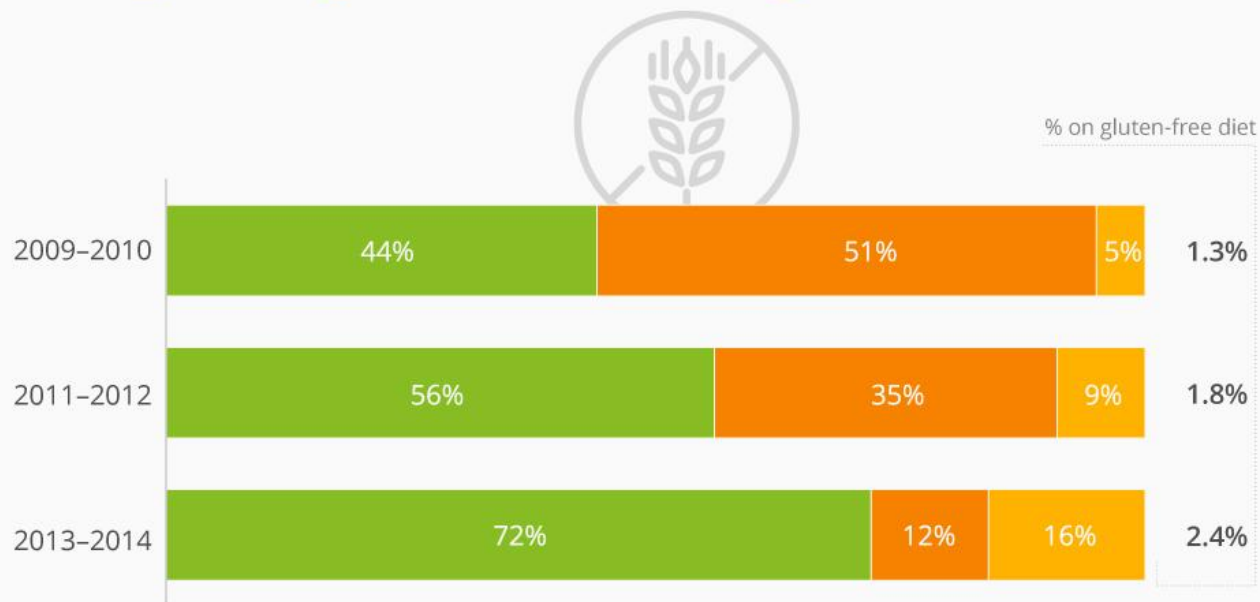
A. Pusztai and S. Bardocz, "GMO in animal nutrition: potential benefits and risks," Chapter 17, *Biology of Nutrition in Growing Animals*, R. Mosenthin, J. Zentek and T. Zebrowska (Eds.) Elsevier, October 2005.

Gluten-free Eating On The Rise

The Rise Of The Gluten-Free Diet

% of Americans on a gluten-free diet with/without celiac disease

■ PWAG* ■ Undiagnosed Celiac Disease ■ Diagnosed Celiac Disease



Symptoms of Gluten Intolerance

- Wide ranging
- Gastrointestinal symptoms: diarrhea, gas, bloat, cramping, stomach pain, reflux, constipation
- Neurological: headaches, depression, mood disorders, dementias
- Joint pain
- Rashes
- Always hungry



Is Gluten Sensitivity Really a Herbicide Reaction?

- Glyphosate herbicide is applied to wheat plants 3 to 7 days before harvesting
- Technique is called preharvesting or desiccation
- Glyphosate levels in food are stable even after a year
- Dr. Stephanie Seneff (MIT) found the symptoms of glyphosate exposure were the same as gluten sensitivity
- WHO declared glyphosate a probable carcinogen in 2015
- 2017 study found fatty acid disease in rats at very low levels.



Glyphosate, pathways to modern diseases II: Celiac sprue and gluten intolerance.

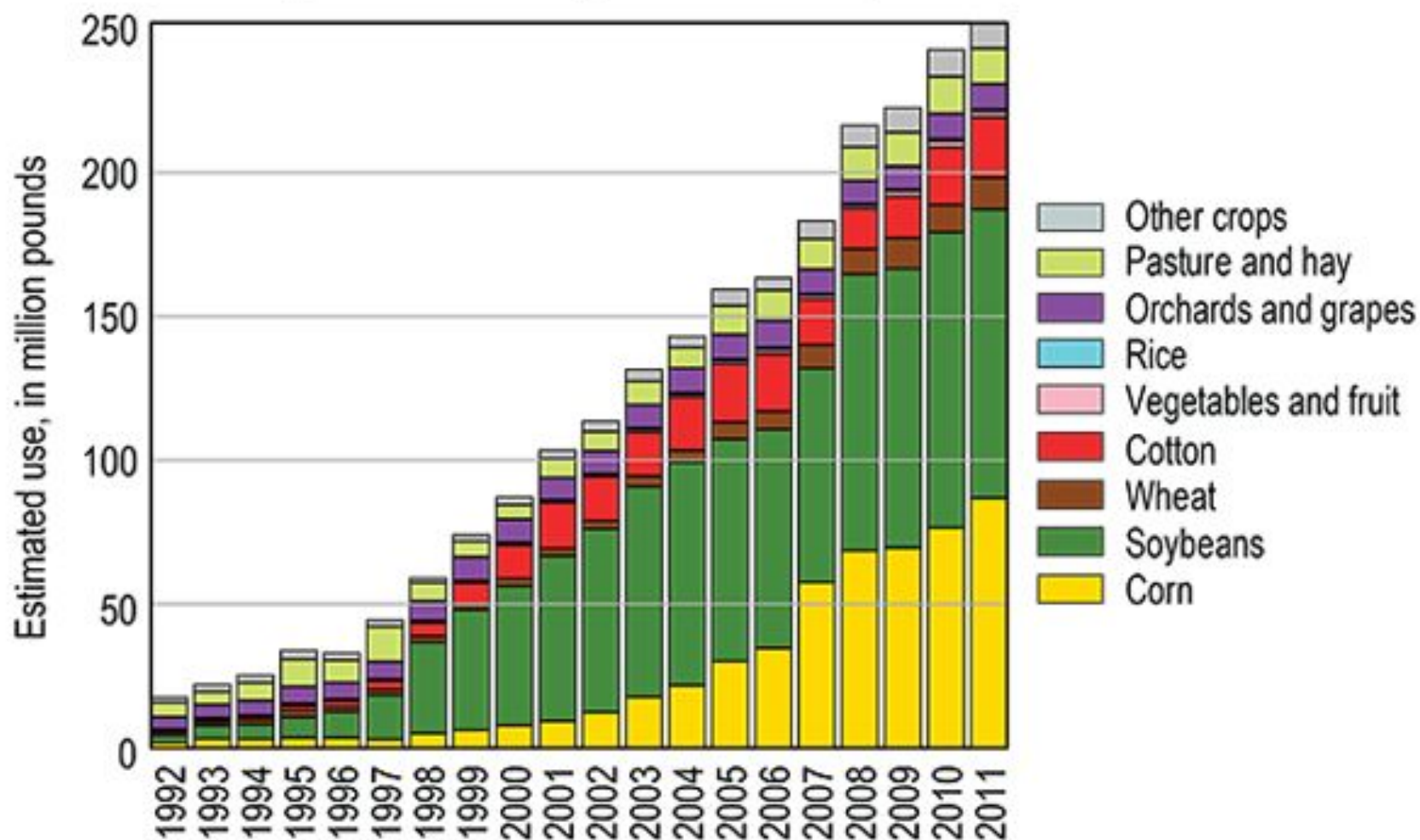
[Anthony Samsel](#) & [Stephanie Seneff](#). [Interdisciplinary toxicology](#) 2013; 6(4):159-184.

GMOs and Glyphosate

- The most popular trait in GMOs is herbicide (glyphosate) resistance
- Glyphosate disrupts GI, kidney, reproductive and kills gut bacteria
- Symptoms of glyphosate exposure and gluten sensitivity are similar (head and stomach aches, fuzzy headedness and dizziness)



Glyphosate Use by Year and Crop



Source: U.S. Geological Survey, National Water Quality Assessment Program,
 Pesticides in U.S. Streams and Rivers: Occurrence and Trends during 1992-2011
<http://water.usgs.gov/nawqa/pnsp/pubs/pest-streams/>

School Lunch Testing

- 34 million school lunches served daily
- Of 44 school lunch items tested, 93.4% had detectable levels of glyphosate
- 74% contained at least one harmful pesticide
- Piperonal Butoxide (a pesticide synergist) found in 41% of hamburger samples-inhibits developmental signaling pathways and is a carcinogen
- 100% of samples contained heavy metals at levels up to 6,293X > EPA max allowable levels
- Lead and cadmium were highest
- Heavy metals cause behavioral, neurocognitive disorders, respiratory issues, cancer and CV disease.

https://www.momsacrossamerica.com/national_school_lunch_testing_program



Glyphosate Food Testing Results: (in parts per billion - ppb)

Full laboratory reports for this food testing can be [found here](#). A searchable database of results can be [found here](#).

General Mills		
	Original Cheerios	Glyphosate - 1,125.3 ppb AMPA - 26.4
	Honey Nut Cheerios	Glyphosate - 670.2 ppb AMPA - 14.5
	Wheaties	Glyphosate - 31.2 ppb
	Trix	Glyphosate - 9.9 ppb
	Gluten Free Bunny Cookies Cocoa & Vanilla	Glyphosate - 55.13* ppb
Kellogg's		
	Corn Flakes	Glyphosate - 78.9 ppb
	Raisin Bran	Glyphosate - 82.9 ppb
	Organic Promise**	Glyphosate - 24.9 ppb
	Special K	Glyphosate - 74.6 ppb
	Frosted Flakes	Glyphosate - 72.8 ppb
	Cheez-It (Original)	Glyphosate - 24.6 ppb
	Cheez-It (Whole Grain)	Glyphosate - 36.25* ppb
	Soft-Baked Cookies, Oatmeal Dark Chocolate	Glyphosate - 275.58* ppb

GLYPHOSATE

30 oat cereal samples tested



100%

had residues with an average of **360 ppb**

27 pinto bean samples tested



100%

had residues with an average of **509 ppb**

NEONICOTINOIDS

22 applesauce samples tested



73%

had residues with an average of **0.037 nmol/g**

25 spinach samples tested



80%

had residues with an average of **0.065 nmol/g**

ORGANOPHOSPHATES

22 applesauce samples tested



100%

had residues with an average of **0.76 nmol/g**

28 apple samples tested



61%

had residues with an average of **0.32 nmol/g**

25 spinach samples tested



32%

had residues with an average of **0.388 nmol/g**

Pesticide/Herbicide Residues

3 Other Reasons to Go Organic

- Organophosphates and carbamates pesticides are cholinesterase inhibitors associated with decreased neuropsychological function*
- Pesticide use causes downstream pollution
- Organically raised produce has higher nutrient content



*Neuropsychological effects of long-term exposure to organophosphate pesticides. *Neurotoxicology and Teratology*, 2005; 27(2): 259-266.

Action Point #1



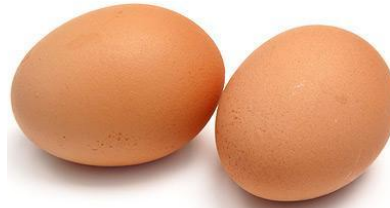
Sweetened
drinks!

Limit juice to 4 oz.
in children < 6 yrs.

Action Point #2

Fix Breakfast/Stabilize Blood Sugar

- Aim for at least 15 grams of protein
- Ditch cereal, frozen waffles, pastries and bagels
- Consider Paleo waffles (made with almond flour and eggs), salmon/fish, smoothies and left-over dinner



2 eggs = 12 g protein



100 g Lentil dahl = 15 g



One large chicken sausage = about 14g



1 cup yogurt = 9 g

Action Point #3 – Go Organic (when possible)



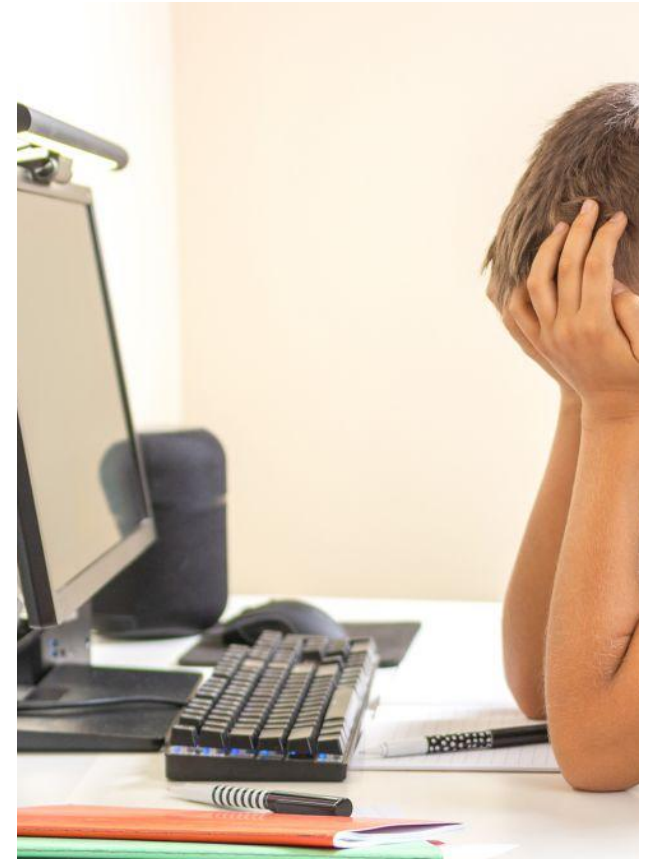
For more information see: momsacrossamerica.com

Replace What's Missing



Nutrient Deficiencies that Affect Mood

- Magnesium- Found to help anxiety in research. Relaxes muscles.
- Zinc- Processed diets are low in zinc. Studies find people low in zinc are more prone to depression
- Vit D- Tends to be low in people with depression
- B vitamins- Low levels of folic acid, for ex, are linked to anxiety and depression as well as a poor response to anti-depressants. Those with a MTHFR gene mutation are more prone to depression/anxiety.
- Iron- Deficiency leads to depression and irritability
- Low selenium, iodine and essential fatty acids cause mood and behavior changes



Learning Physically Changes The Brain

- Hebb Model (“neurons that fire together, wire together”)
- When two neighboring neurons are triggered at the same time on several occasions, the cells and synapses between them change chemically
- The connection can become so strong that they fire simultaneously instead of in sequence
- Association helps to tie new information into existing pathways (established pathways help strengthen weak signals)



Basic Supplement Support Program

- Multiple vitamin/mineral
- Vitamin D- Usually 1-2,000 IUs for most people
- Fish Oil/Essential Fatty Acids
- Magnesium (with calcium if dairy-free or little dairy consumption)

Multivitamin may prevent 130,000 cases of cancer a year

- Conclusion of large study on vitamin use by Dr. Gaziano (Brigham and Women's Hospital)
- Possibly because the average American does not get enough vitamin D and E for basic health
- 40% don't attain minimum standard for vitamin C
- Half are low in calcium, magnesium and vitamin A



Fats are Structural Nutrients for the Brain

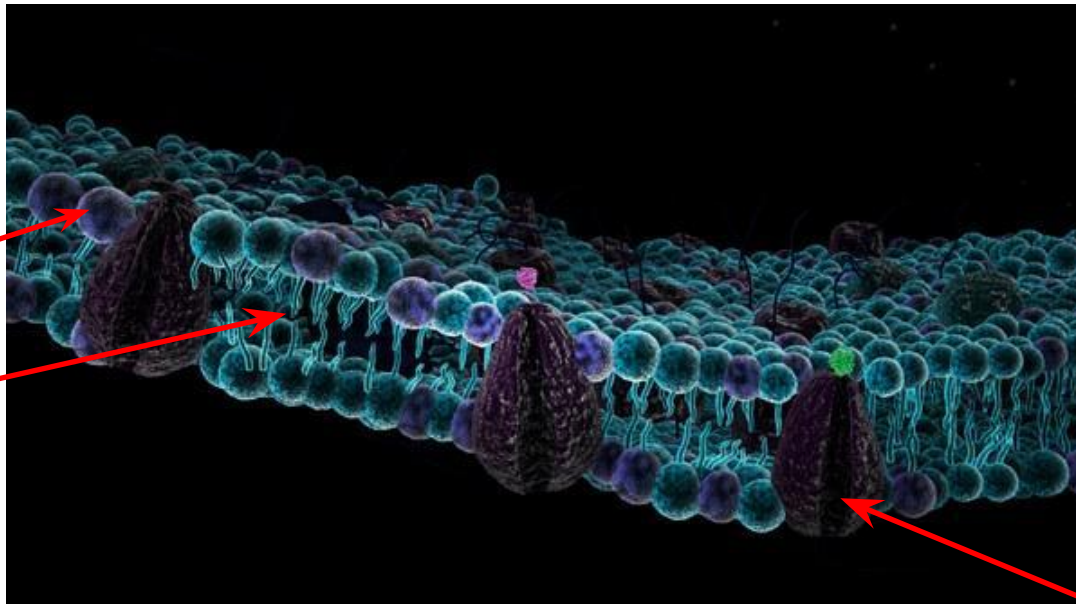


- Brain 60-70% fat
- 25% of fat is DHA (long chain fat found in fish)
- Blood brain barrier and gut lining made of similar tissue: Leaky Gut = Leaky Brain

Cell Membrane

Hydrophilic
Head (likes
water)

Hydrophobic
Tail (fatty
acyl side chains)

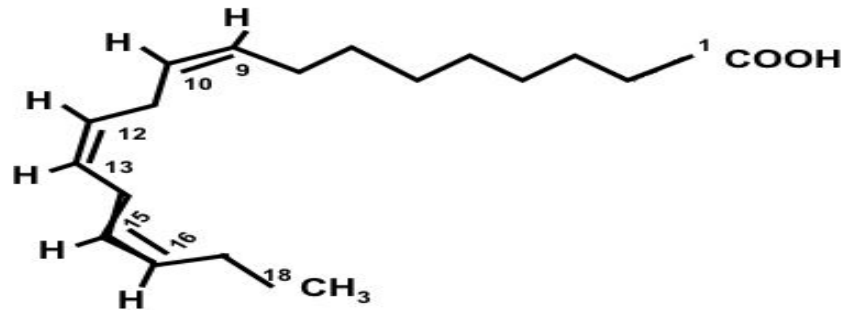


Phospholipic B

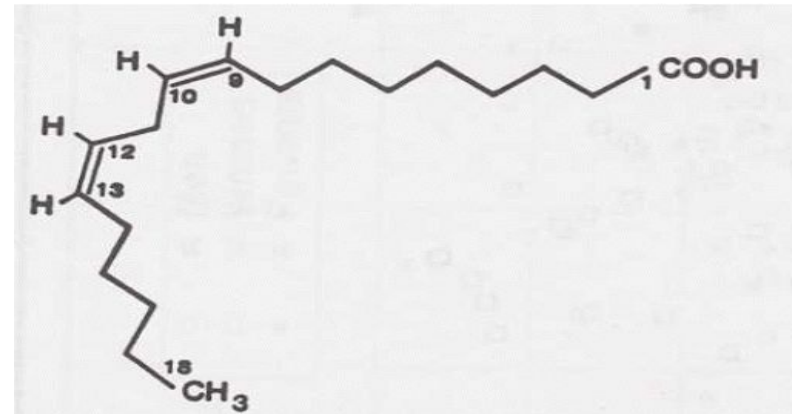
Protein channe

The Essential Fats

- Alpha-linolenic Acid (omega 3)



- Gamma- Linoleic Acid (omega 6)
- Must get from the diet



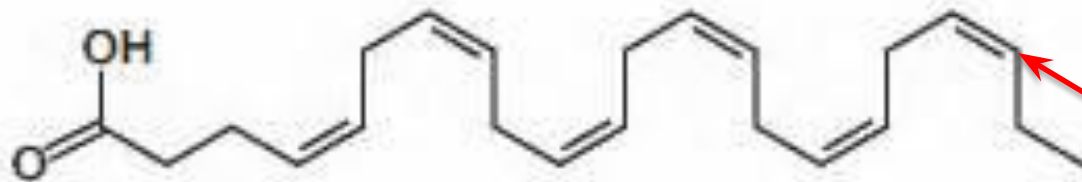
Symptoms of Essential Fatty Acid Deficiency

- ✓ Dry skin patches or permanent goose flesh (often diagnosed as keratosis pilaris)
- ✓ Course, straw-like hair
- ✓ Excessive thirst
- ✓ Lack of thirst
- ✓ Wax build-up in ears
- ✓ Toe walking (rare)

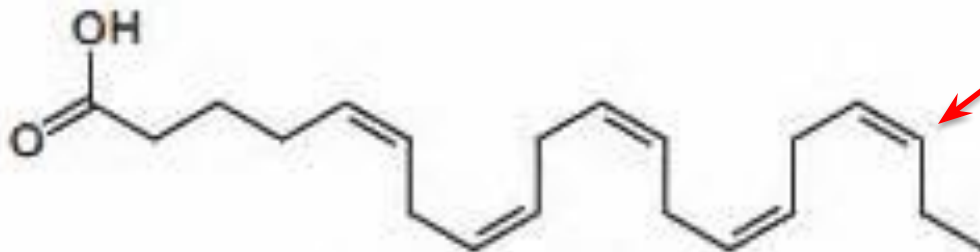


The Fish Fats

- Not essential- made thru elongation process
- Process is not efficient



DHA (22:6n-3)



EPA (20:5n-3)

Omega-3
fats

DHA vs. EPA for the Brain

DHA

- Increases Brain Derived Neurotrophic Factor (BDNF)- a “growth hormone” for the brain
- “Learning performance decreased according to levels of BDNF” in animal studies (WU A, et al, *J Neurotrauma* (2004) Oct 21;10:1457-67)
- Critical for visual development

EPA

- Reduces inflammation
- Better for mood stabilization
- “Omega-3 treatment of childhood depression” A controlled double-blind pilot study”(Nemets H et al, *Am J of Psych* (2006) 163: 1098-1100.

Best Fat Sources in the Diet

- Sunflower oil (1 T.) 8.9 grams
- Sesame oil (1 T.) 5.6
- Peanut oil (1 T.) 4.3
- Walnuts (1 oz.) 2. 6 grams
- Wild-caught Salmon (4 oz)
2 grams
- Trout (4 oz) 1.2 grams
- Olive oil (1 T.) 1.1 grams



Shelf Stable Fats and Inflammation

- Chemically altered to reduce spoilage
- When incorporated into nervous system, structure determines function
- Fats are also building blocks for messenger molecules. Altered fats become inflammatory promoting signalers such as prostaglandins and leukotrienes.



Beware of Packaged Foods

Enriched Bleached Wheat Flour (Bleached Flour, Malted Barley Flour, Niacin, Iron, Thiamin Mononitrate, Riboflavin, Folic Acid), Vegetable Oil (contains one or more of the following oils: Cottonseed Oil, Palm Oil, Soybean Oil), Dextrose, Water, Sugar, High Fructose Corn Syrup, Food Starch – Modified (Corn and/or Wheat), Contains 2% or Less of the Following: Eggs, Nonfat Milk, Glycerin, Soy Flour, Corn Syrup Solids, Leavening (Sodium Acid Pyrophosphate, Baking Soda, Sodium Aluminum Phosphate), Preservatives (Potassium Sorbate, Sodium Propionate, Calcium Propionate), Salt, Natural and Artificial Flavor, Mono- and Diglycerides, Soy Lecithin, Spices, Tapioca Starch, Wheat Starch, Artificial Color, Cellulose Gum, Guar Gum, Karaya Gum, colored with extracts of Annatto and Turmeric.



Fish Oil May Lessen Effects of Junk Food on the Brain

- Meta-analysis of 185 papers
- Dr. Lucy Pickavance (Un of Liverpool Institute of Ageing and Chronic Disease) concluded they may mitigate detrimental effects triggered by eating a bad fat diet



Fish Oil and Mood



- Fish oil as a management component for mood disorders – an evolving signal

Current Opinion in Psychiatry

[January 2013 - Volume 26 - Issue 1 - p 33–40](#)

Summary: There is sufficient indicative data favoring EPA-weighted omega-3 supplementation for those with a depressive mood disorder, particular when fish oil is viewed by patients as ‘natural,’ it has few side effects and is neuroprotective. Recent meta-analyses inform us that intervention studies should focus on EPA-weighted preparations.

Fish Oil Supplements

High Quality Traditional Fish Oils

Nordic Natural Liquids

Carlson's fish oils

Neutral Flavored Liquid

Omega Cure (www.omega3innovations.com)

Mild, unflavored liquid

Pleasant Flavored Liquid

Barlean's Omega Swirl Fish Oil
(lemon, mango peach, piña colada)

90% EPA Formulas (for mood disorders)

Minami Mood by Garden of Life

Omegavia EPA 500 (www.omegavia.com)-
pharmaceutical grade capsules- CHEAPEST



Magnesium and Mood

Involved in muscle contraction, ATP, production of nucleic acids, calcium metabolism

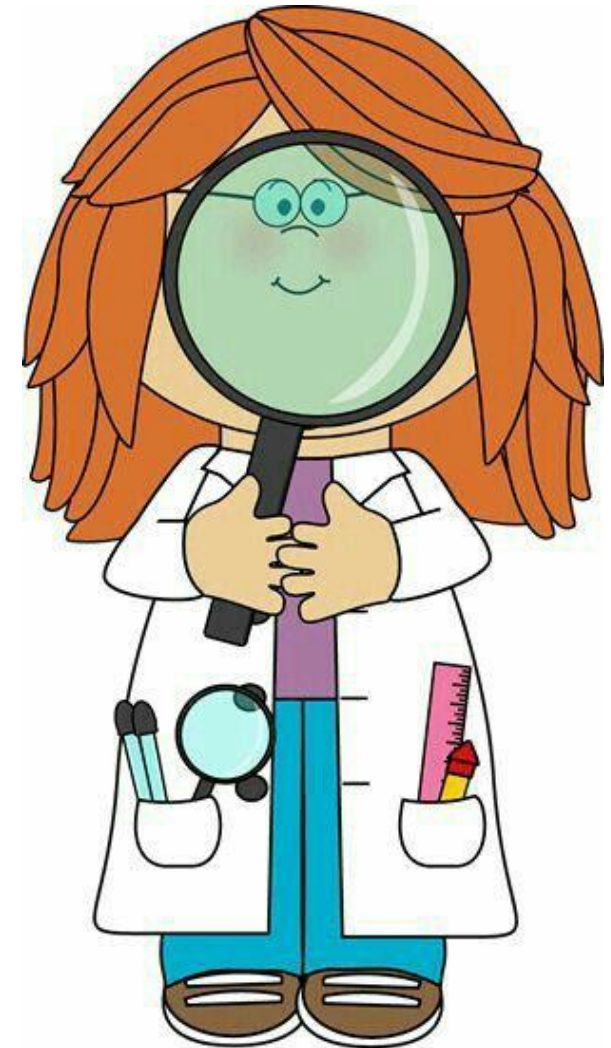
Acts on the limbic-hypothalamus-pituitary-adrenocortical axis and increases adrenal sensitivity to adrenocorticotrophic hormone. (Stress increases Mg excretion.)

Low magnesium diets associated with depression and elevated anxiety

Studies suggest supplementation could help depression, mania, and bipolar disorder.

Twelve weeks on 450mg of Mg was as effective as tricyclic antidepressants. (Efficacy in other studies not consistent.)

Boyle, NB et al. *Nutrients*, 2017 May; 9(5): 429.



Symptoms of Low Magnesium


- Fatigue
- Muscle spasms/cramps
- Trouble Sleeping
- Irritability
- Anxiety
- Irregular heart beat
- Loss of appetite
- Hyperactivity



Thank You!

"Her research is solid, her insights are excellent, and her advice is just what you need."
—THE WASHINGTON POST


CURE YOUR CHILD WITH FOOD



SOLUTIONS FOR

- ☑ Picky eating
- ☑ Reflux
- ☑ Stomachache
- ☑ Ear infections
- ☑ Failure to grow
- ☑ Constipation
- ☑ Rashes
- ☑ Sleeplessness
- ☑ Mood disorder
- ☑ ADHD and SPD
- ☑ Hyperactivity
- ☑ Dyspraxia (speech delays)
- ☑ and more

**The Hidden Connection
Between Nutrition and
Childhood Ailments**



KELLY DORFMAN, MS, LND Foreword by Richard E. Layton, MD,
PEDIATRIC ALLERGY SPECIALIST

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