



GMOs & glyphosate -- real threats to human & environmental health

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*“Those who have the privilege to know,
have the duty to act..”*

Albert Einstein

Outline

- Overview
- Evidence of Toxicity
- Glyphosate in Proteins
- Sugar Beets, Glyphosate, MS and Madcow
- Collagen, Arthritis and Vaccines
- Neurological Diseases
- Diabetes, Obesity and Adrenal Insufficiency
- How to Safeguard Yourself and Your Family
- Summary

Overview

THIS IS THE NEW CHILDHOOD IN AMERICA:

- 1 in 3 is overweight
- 1 in 6 has learning disabilities
- 1 in 9 has asthma
- 1 in 10 has ADHD
- 1 in 12 has food allergies
- 1 in 20 has seizures
- 1 in 54 males has autism

1 in 68 autism

50% (half) of all children have chronic illness or are overweight.

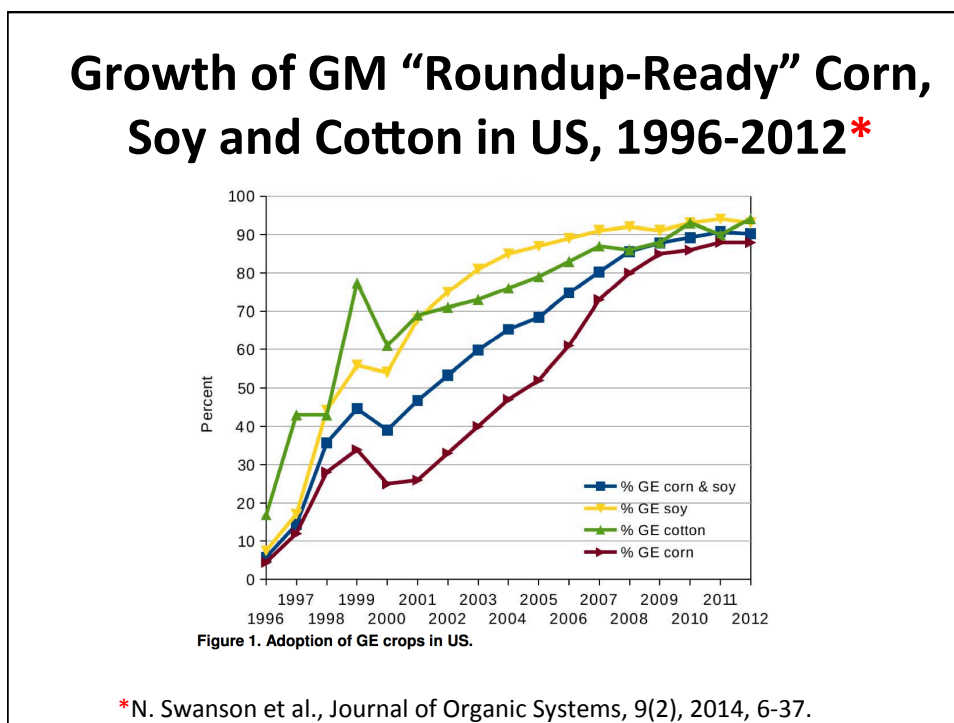
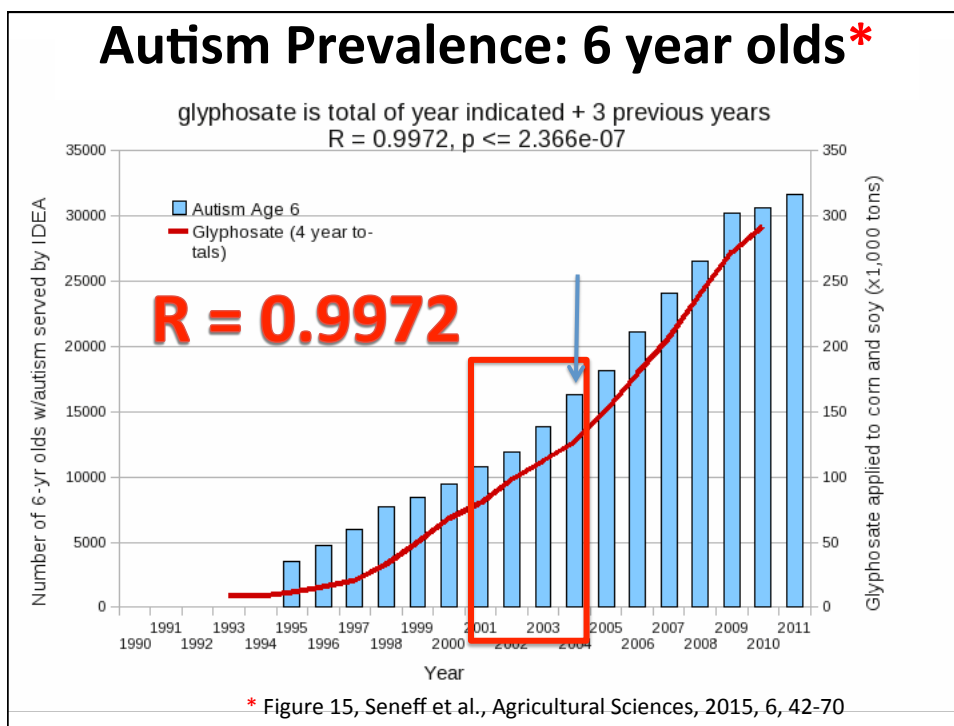
This is the **NEW NORMAL** in our country.

Are you concerned yet?!
Because if you're not,
then you are not paying attention!

Roundup and GMO Crops

GMO Roundup-Ready corn, soy, canola, sugar beets
cotton, tobacco and alfalfa





“Glyphosate Now the Most-Used Agricultural Chemical Ever”*

By Douglas Main, Feb 2, 2016 Newsweek

- Glyphosate usage has increased 50-fold since 1996, when GMO glyphosate-resistant crops were introduced in the US.
- Today, 50 times more glyphosate is allowed by the EPA on corn grain than in 1996
- Half of the American farmers' fields have weeds that are resistant to glyphosate
- New GMO crops offer dual resistance to glyphosate & 2,4-D → Enlist Duo

*www.newsweek.com/glyphosate-now-most-used-agricultural-chemical-ever-422419

Sobering Statistics on Glyphosate Residues*

- 0.1 ppb: altered the gene function of over 4000 genes in the livers and kidneys of rats.
- 0.1 ppb: severe organ damage in rats
- 0.1 ppb: Permitted level for glyphosate and all other herbicides in EU tap water
- 10 ppb: toxic effects on the livers of fish
- 700 ppb: Permitted level for glyphosate in U.S. tap water**
- 11,900 ppb: found in Genetically Modified (GMO) Soybeans

** Canada: 280 ppb

*<http://detoxproject.org/glyphosate-in-numbers/>

Sobering Statistics on Glyphosate Residues*

Zen Honeycutt, of Moms Across America found levels in human breast milk that were 1600 times higher than the upper limit allowed in water in Europe

- 700 ppb: Permitted level for glyphosate in U.S. tap water**
- 11,900 ppb: found in Genetically Modified (GMO) Soybeans

** Canada: 280 ppb

*<http://detoxproject.org/glyphosate-in-numbers/>

Glyphosate in Cotton Products*

- “The vast majority – 85 percent – of tampons, cotton and sanitary products tested in a new Argentinian study contained glyphosate”
- In 2014, 96 percent of cotton produced in the United States was genetically modified to resist glyphosate



*<https://www.rt.com/usa/319524-tampons-cotton-glyphosate-monsanto/>

Is Glyphosate Toxic?



- Monsanto has argued that glyphosate is harmless to humans because our cells don't have the shikimate pathway, which it inhibits
- However, our gut bacteria DO have this pathway
 - We depend upon them to supply us with essential amino acids (among many other things)
- Other ingredients in Roundup greatly increase glyphosate's toxic effects and are themselves toxic
- Insidious effects of glyphosate accumulate over time
 - Most studies are too short to detect damage

Main Toxic Effects of Glyphosate*

- Interferes with function of cytochrome P450 (CYP) enzymes
- Chelates important minerals (iron, cobalt, manganese, etc.)
- Interferes with synthesis of aromatic amino acids and methionine
 - Leads to shortages in critical neurotransmitters and folate
- Disrupts sulfate synthesis and sulfate transport

**Samsel and Seneff, Entropy 2013, 15, 1416-1463*

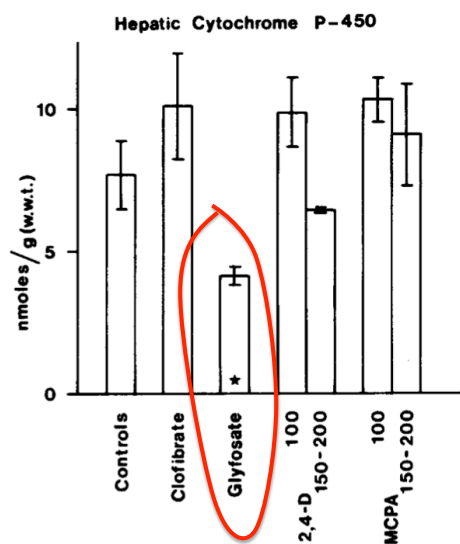
Glyphosate: The Central Mechanisms*

- Glyphosate acts as an antibiotic to disrupt gut bacteria, leading to overgrowth of pathogens
- Disruption of liver CYP enzymes leads to impaired bile flow and low vitamin D
 - This disrupts sulfate synthesis and transport
 - Also impairs detoxification of other toxic chemicals
- Damage to red blood cells leads to anemia and toxicity due to free iron
 - Hypoxia ensues → low grade encephalopathy
- Leaky gut and leaky brain barrier lead to neuronal exposure to dangerous metals and neurotoxins

* A Samsel and S Seneff, *Entropy* **2013**, 15(4), 1416-1463

Evidence of Toxicity

Inhibition of Cytochrome P450 Enzymes (CYPs) by Various Pesticides*



Study in rats on
2,4-D, clofibrate,
MCPA, and
glyfosate

*E Hetanen et al., Acta Pharmacol.
Et Toxicol. 1983, 53, 103-112.

Glyphosate Depletes Iron, Manganese and Zinc in Plants*

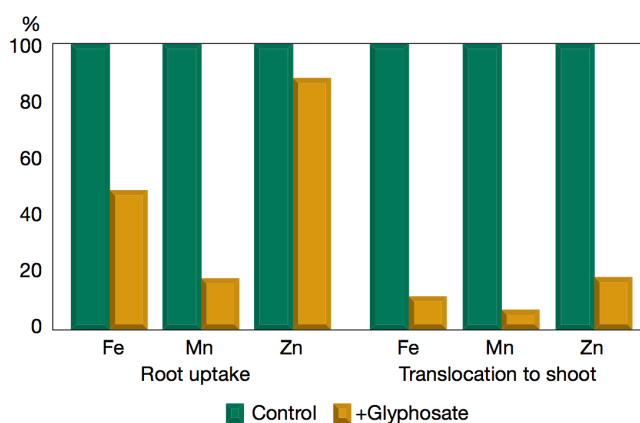
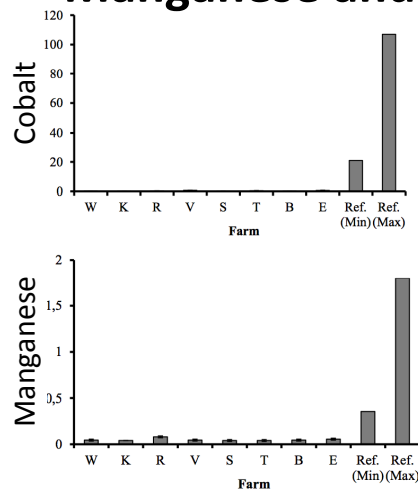


Figure 1. Effect of glyphosate* on nutrient uptake and translocation by "non-target" plants, Eker, et al. 2006. (* 2.5% of recommended herbicidal rate of glyphosate.)

*D Huber, What About Glyphosate-Induced Manganese Deficiency? Fluid Journal, 20-22.

Severe Deficiency in Serum Manganese and Cobalt in Cows*



Eight different farms: all cows tested had glyphosate in the urine

*M. Krüger et al., J Environ Anal Toxicol 2013, 3:5

Some Consequences of Manganese Deficiency

- Lactobacillus critically depend on manganese
- Manganese superoxide dismutase protects mitochondria from oxidative damage
- Manganese is essential for detoxing glutamate (neurotoxin)
- Pituitary depends on manganese to release thyroid stimulating hormone
- Chondroitin sulfate synthesis in bones

The Enhancing Effect of Adjuvants*

“Adjuvants in pesticides are generally declared as inerts, and for this reason they are not tested in long-term regulatory experiments. It is thus very surprising that they amplify *up to 1000 times* the toxicity of their APs [Active Principles] in 100% of the cases where they are indicated to be present by the manufacturer.”

*R. Mesnage et al. BioMed Research International 2014; Article ID:179691.

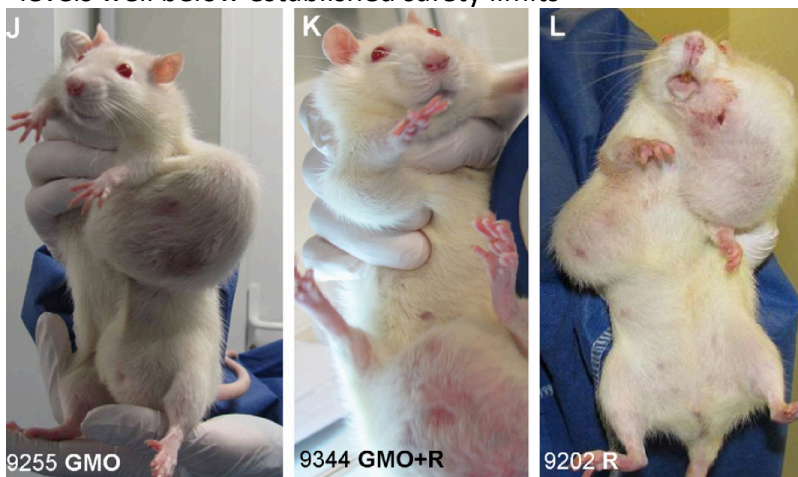
Roundup Safety Claims Disputed*

“It is commonly believed that Roundup is among the safest pesticides. ... Despite its reputation, *Roundup was by far the most toxic among the herbicides and insecticides tested*. This inconsistency between scientific fact and industrial claim may be attributed to huge economic interests, which have been found to falsify health risk assessments and *delay health policy decisions*.”

*R. Mesnage et al., Biomed Research International, Volume 2014 (2014), Article ID 179691

Mammary Tumors in Rats*

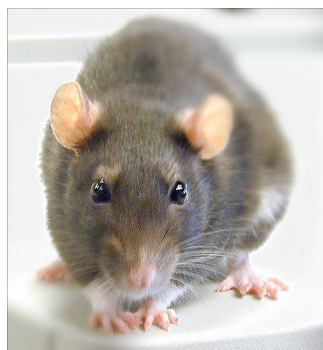
Rats through their entire lifespan exposed to Roundup at levels well below established safety limits



*G.-E. Séralini et al., Food Chem. Toxicol. 2012;50(11):4221-4231

Conclusions from Rat Study *

- Female rats had greatly increased risk of mammary tumors
- Males had significantly increased risk of liver and kidney disease
- Sex hormone disruption for both males and females
- Enhanced oxidative stress
- *Effects didn't become apparent until after 4 months*



*G.-E. Séralini et al., Food and Chemical Toxicology, 2012, *in press*

Paper Showing Strong Correlations between Glyphosate Usage and Chronic Disease

Journal of Organic Systems, 9(2), 2014

ORIGINAL PAPER

Genetically engineered crops, glyphosate and the deterioration of health in the United States of America

Nancy L. Swanson¹, Andre Leu^{2*}, Jon Abrahamson³ and Bradley Wallet⁴

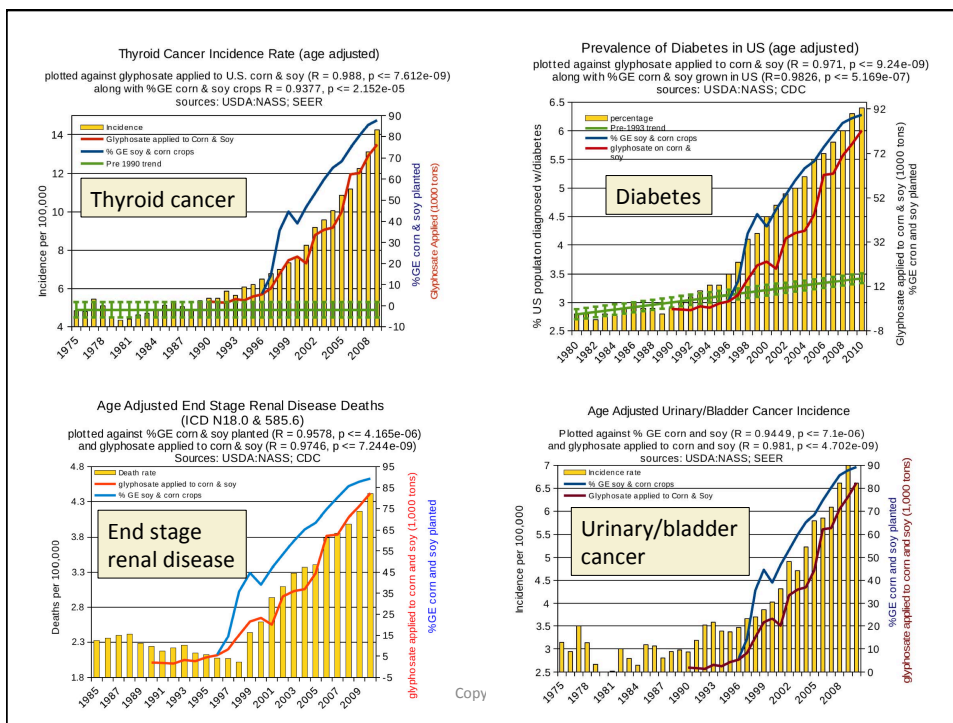
¹ Abacus Enterprises, Lummi Island, WA, USA

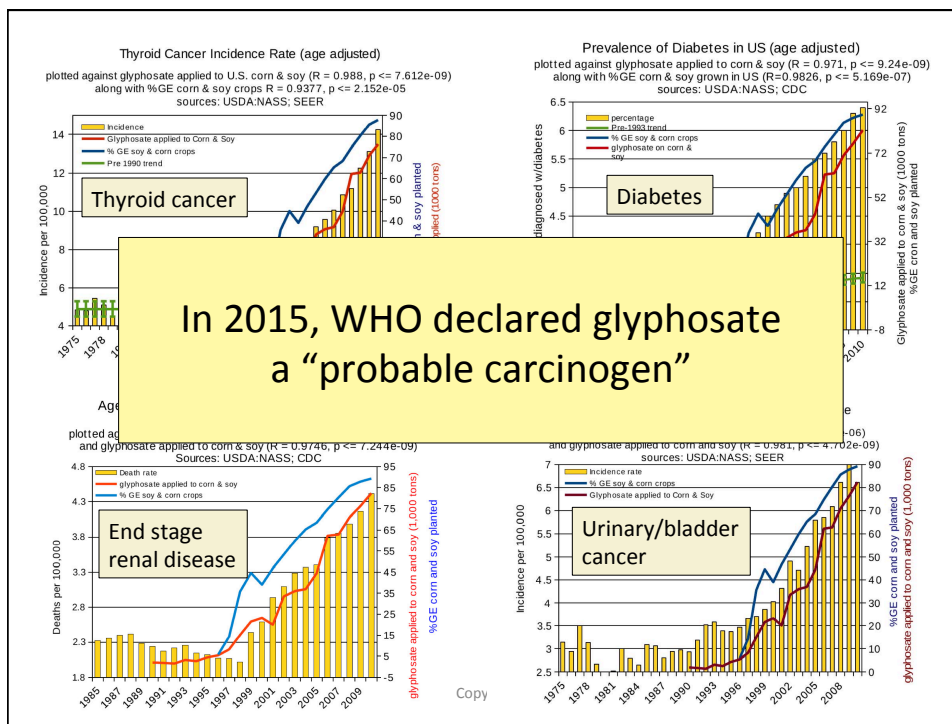
² International Federation of Organic Agricultural Movements, Bonn, Germany

³ Abacus Enterprises, Lummi Island, WA, USA

⁴ Crustal Imaging Facility, Conoco Phillips School of Geology and Geophysics, University of Oklahoma, USA

* Corresponding author: andreleu.ai@gmail.com





Quote from the Conclusion*

“Although correlation does not necessarily mean causation, when correlation coefficients of over 0.95 (with p -value significance levels less than 0.00001) are calculated for a list of diseases that can be directly linked to glyphosate, via its known biological effects, it would be imprudent not to consider causation as a plausible explanation.”

*NL Swanson et al. Journal of Organic Systems 9(2), 2014, p. 32,

Glyphosate and Antibiotic Resistance

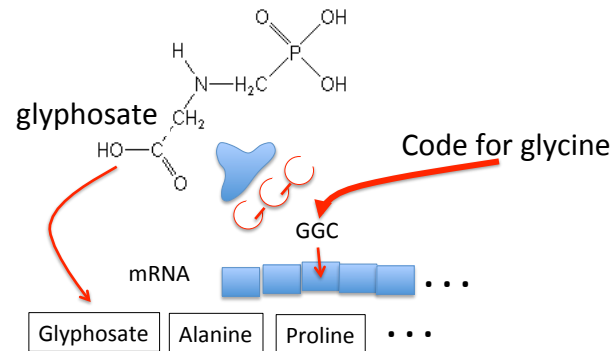
- E. coli develop resistance to glyphosate by overexpression of efflux pumps*
- These pumps can also export multiple antibiotics → antibiotic resistance
- These efflux pumps enable pathogens to adhere to and invade host cells**
- Multiple gut pathogens could potentially develop multi-antibiotic resistance with chronic exposure to glyphosate

*JM Staub et al. J Ind Microbiol Biotechnol (2012) 39:641–647

**LJV Piddock, Nature Reviews 2006;4:629-636.

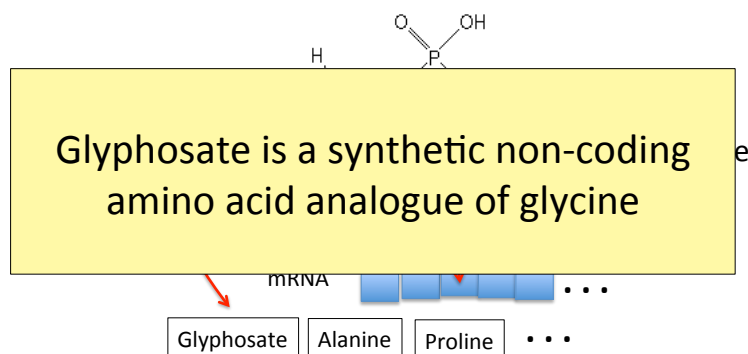
Glyphosate in Proteins

What If Glyphosate Could Insert Itself Into Protein Synthesis???



Any proteins with conserved glycine residues are likely to be affected in a major way

What If Glyphosate Could Insert Itself Into Protein Synthesis???



Any proteins with conserved glycine residues are likely to be affected in a major way

Some Predicted Consequences

- Neurological diseases
- Neural tube defects
- Celiac disease
- Impaired collagen → osteoarthritis
- Steatohepatitis (fatty liver disease)
- Obesity and adrenal insufficiency
- Impaired iron homeostasis and kidney failure
- Insulin resistance and diabetes
- Cancer
- Autoimmune diseases

Circumstantial Evidence from the Rhizosphere*

- Researchers used RNA sequence analysis to quantify changes in microbial protein expression in presence of glyphosate
- Found significant increase in production of enzymes related to protein synthesis and protein breakdown



* MM Newman et al., Science of the Total Environment 553 (2016) 32–41

An Analogy: ALS in Guam

- An epidemic in ALS in Guam was traced to a natural toxin found in cycads
- *BMAA* is a non-coding amino acid that gets inserted by mistake in place of serine
- Defective versions of a glutamate transporter have been linked to ALS*
- The transporter has an essential serine-rich region in its sequence**

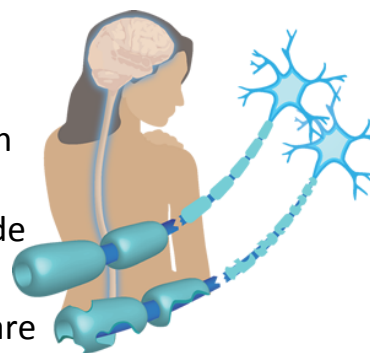


*Antioxidants & Redox Signaling 2009;11: 1587-1602.

**DJ Slotboom et al., PNAS 1999; 96(25): 14282-14287.

Another Analogy: Multiple Sclerosis & Sugar Beets*

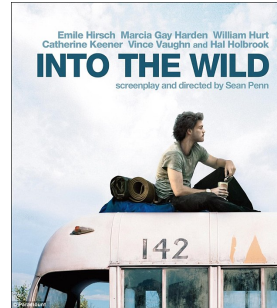
- Sugar beets contain an analogue of proline called *Aze*
- Remarkable correlation between MS frequency and proximity to sugar beet agriculture, worldwide
- Myelin basic protein contains a cluster of proline residues that are absolutely essential for its proper function



*E. Rubenstein, J Neuropathol Exp Neurol 2008;67(11): 1035-1040.

Into The Wild*

- Chris McCandless died in the Alaskan wilderness in 1992
- A staple of McCandless' diet was seeds from a wild potato plant which contained L-canavanine, a non-coding amino acid analogue of L-arginine
- Author Jon Krakauer determined that McCandless was slowly poisoned by L-canavanine



*J Krakauer et al., Wilderness & Environmental Medicine 2015; 26: 36-42.

**Sugar Beets, Glyphosate,
MS and Madcow**

Madcow Disease: Bovine Spongiform Encephalopathy

- Symptoms include lower limb paralysis similar to multiple sclerosis
- Related to Creutzfeldt-Jakob disease and kuru in humans, "scrapie" in sheep, and chronic wasting disease in deer
- *Cows are fed large amounts of sugar beet pulp (residue from sugar processing)*
 - *Is this a causal agent?*

UK Epidemic in Madcow

- "Dried molassed sugar-beet pulp" fed to British cows as of 1986.*
- Madcow epidemic in great Britain began in the 1980's and peaked in 1993.

*RG Hemingway et al., A note on the effect of molasses inclusion in sugar beet pulp on the yield and composition of the milk of dairy cows. *Animal Production* 1986;42(3) :417-420.

Root Rot: Fungus Infection

- Aze has been shown to have anti-fungal properties*
- Glyphosate increases risk to fungus infection causing root rot in sugar beets**
- This suggests that glyphosate might increase Aze production in sugar beets



*B Bach et al., Specialia Experientia 1978;34(6):688-688.

**R Larson et al. Pest Manag Sci. 2006;62(12):1182-92.

Relationship to Glyphosate-Metabolizing Microbes*

- Diseased cows test high in antibodies to two bacterial species: *Pseudomonas aeruginosa* and *Acetobacter*
 - These two microbes are among very few that can metabolize glyphosate
- Humans with MS, type I diabetes and Celiac disease also test high for these antibodies
- Authors propose autoantibodies to both white and gray matter brain components due to molecular mimicry

*A Ebringer et al., Ann N Y Acad Sci 2005;1050:417-28.

A Ebringer et al., Medical Hypotheses 2012;78(6):763-769.

Relationship to Glyphosate-Metabolizing Microbes*

- Diseased cows test high in antibodies to two bacterial species: *Pseudomonas aeruginosa* and *Acinetobacter*
 - These microbes are exposed to high levels of glyphosate and they incorporate it into their proteins by mistake, leading to impaired proteolysis and antibody development
- Human Celiac disease proteins by mistake, leading to antibodies
- Authoritative white matter due to molecular mimicry

Hypothesis:
 These microbes are exposed to high levels of glyphosate and they incorporate it into their proteins by mistake, leading to impaired proteolysis and antibody development

* A Ebringer et al., Ann N Y Acad Sci 2005;1050:417-28.
 A Ebringer et al., Medical Hypotheses 2012;78(6):763-769.

Homologous Sequences*

<i>Acinetobacter</i>		<i>Pseudomonas</i>	
3-OACT-A	4-CMLD	γ-CMLD	
Leu-Tyr-Arg-Ala-Gly-Lys 90. L Y R A G K .95	Ser-Arg-Phe-Ala-Trp-Gly 42. S R F A W G .47	Thu-Arg-His-Ala-Trp-Gly 42. T R H A W G .47	
L Y R N G K .55	S R F S W G .19	S R F S W G .119	
Leu-Tyr-Arg-Asp-Gly-Lys	Ser-Arg-Phe-Ser-Trp-Gly	Ser-Arg-Phe-Ser-Trp-Gly	
MOG	MBP	MBP	

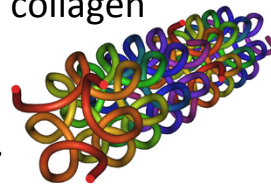
Central Nervous System White Matter

* A Ebringer et al., Medical Hypotheses 78 (2012) 763–769

Collagen, Arthritis and Vaccines

Collagen and Gelatin

- 25% of the protein in our body is collagen
- Collagen forms a triple helix with building block triples of Gly-X-X, where X is often proline.
- Glyphosate substitution for glycine will disrupt triple-helix formation and lead to diseases of the vasculature, joints and bones
- Gelatin is derived from collagen in ligaments sourced from cows and pigs fed glyphosate-contaminated GMO Roundup-Ready feed

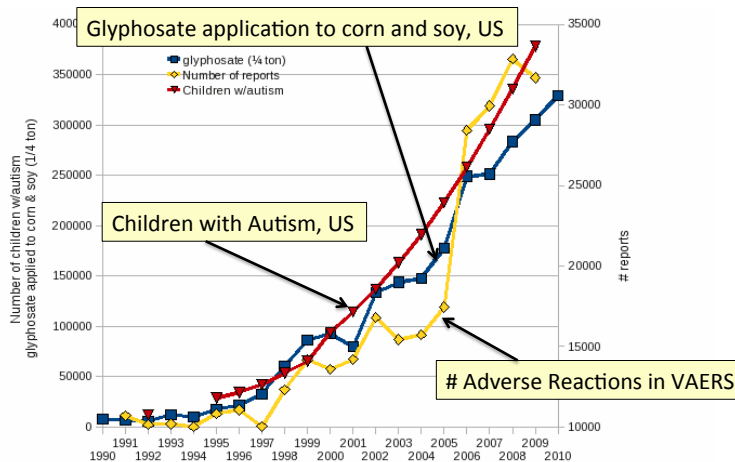




Glyphosate in Vaccines?

- For MMR, flu vaccine, and rabies vaccine, live virus is grown on gelatin derived from ligaments of pigs
 - Pigs are fed GMO Roundup-Ready corn and soy feed
- Gelatin contains significant amounts of both glycine and glutamate
 - These two neurotransmitters together excite the NMDA receptors in the brain
 - Glyphosate substitution in the protein for glycine is a possibility!
- Glyphosate stimulation of NMDA receptors could cause neuronal burnout

Autism, Glyphosate, Vaccine Reactions*



*Collaboration with Dr. Nancy Swanson

Symptoms of Adverse Reactions to MMR before and after 2002*

More Common Before 2002

Reaction	Count Before 2002	Count After 2002	p-value
joint pain	126	65	0.036

More Common After 2002

Reaction	Count Before 2002	Count After 2002	p-value
hospitalization	71	319	0.00037
seizures	203	462	0.0014
shortness of breath	100	216	0.010
hives	324	504	0.011
mumps	5	51	0.014
abscess	51	120	0.022
autism	69	143	0.024
eczema	4	36	0.026
ear infection	16	56	0.031
anaphylactic shock	16	54	0.034
facial swelling	45	95	0.040
swelling	860	1018	0.048

*Data analyzed from the VAERS database

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urticaria	89	143	0.024
eczema	4	36	0.026
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Facial swelling	45	95	0.040
swelling	860	1018	0.048

These are all characteristic symptoms of allergies to MSG

*Data analyzed from the VAERS database

Glyphosate and Glutamate*

- Acute exposure activates NMDA receptors and voltage-dependent calcium channels
 - Oxidative stress and neural cell death
 - Increased glutamate release into the synaptic cleft → *excessive extracellular glutamate levels*
 - Decreased glutathione content
 - Increased peroxidation of lipids (fats)



*<http://www.greenmedinfo.com/blog/roundup-weedkiller-brain-damaging-neurotoxin>

MMR, Glyphosate, Molecular Mimicry

- MMR vaccine “takes” if child develops antibodies to measles hemagglutinin*
- Hemagglutinin has strong sequence similarity to myelin basic protein (MBP)
- A measles virus infection in the brain could induce autoantibodies to MBP
 - This over time would destroy the myelin sheath
- Children with autism have high titers of antibodies to hemagglutinin and autoantibodies to MBP**



*RL de Swart et al., Journal of Virology 2005; 11547-11551.

**VK Singh et al., J Biomed Sci 2002;9(4):359-64

MMR, Glyphosate, Molecular Mimicry

- MMR vaccine “takes” if child develops antibodies to measles hemagglutinin*



Glyphosate induces leaky gut due to overgrowth of pathogens, and this leads to a leaky brain barrier permitting antibody access to the brain

- Children with autism have high titers of antibodies to hemagglutinin and autoantibodies to MBP**

*RL de Swart et al., Journal of Virology 2005; 11547-11551.

**VK Singh et al., J Biomed Sci 2002;9(4):359-64

Neurological Diseases

Neurological Diseases

At least four neurological diseases related to misfolded proteins involve conserved glycine residues

Disease	Protein	Reference
Alzheimer's	Amyloid beta	Goure et al.
Parkinson's disease	Alpha synuclein	Du et al.
ALS	TDP-43	Pesiridis et al.
Prion diseases	Prion proteins	Harrison et al.

WF Goure et al., *Alzheimer's Research & Therapy* 2014; 6: 42.

H-N Du et al., *Biochemistry* 2003; 42: 8870-8878.

S Pesiridis et al., *Hum Mol Genet* 2009; 18(R2): R156-R162.

CF Harrison et al., *J Biol Chem* 2010; 285(26): 20213-20223.

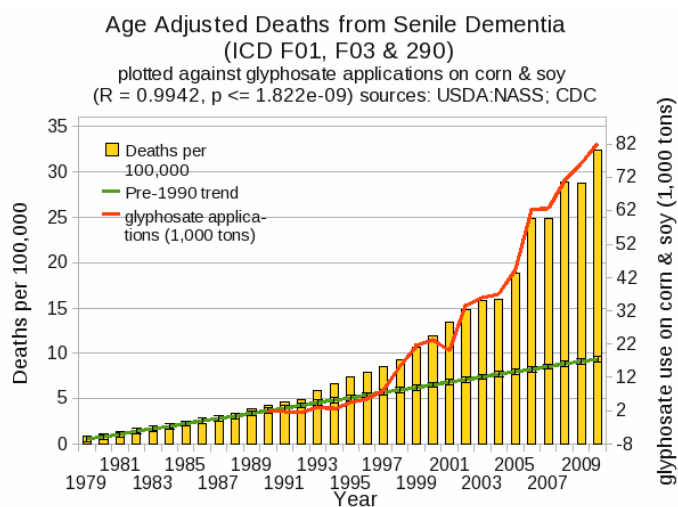
Neurological Diseases

In all cases, the issue is a *rare soluble* peptide rather than the precipitated plaque.

The glycine residues are strongly implicated in the disease process

Glyphosate increases the protein's solubility

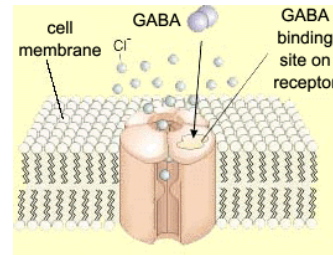
Deaths from Senile Dementia*



*Plot provided by Dr. Nancy Swanson

Impaired GABA Receptor Activity and Autism

- Autism has been linked to a weakened response of the inhibitory GABA receptor to stimuli*
- The GABA receptor has a conserved glycine at the entrance to the first membrane-spanning domain that is essential for its function**



*CD Robertson et al., Current Biology 2016;26: 80-85

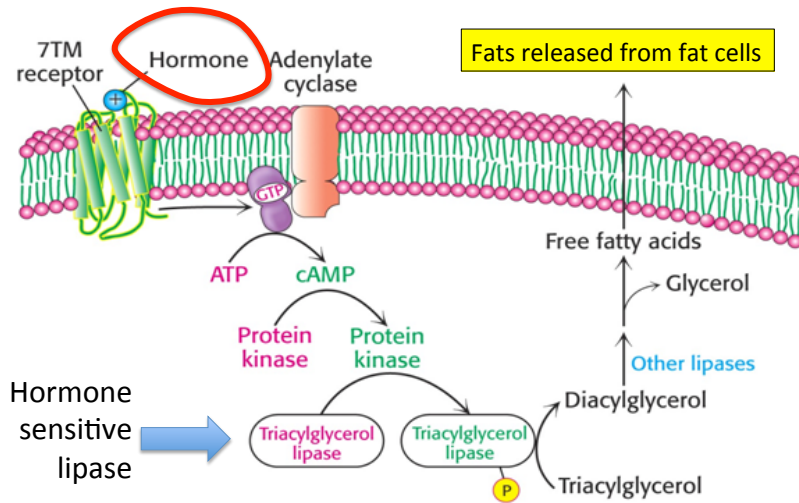
**BX Carlson et al., Mol Pharmacol. 2000;57(3):474-84

Diabetes, Obesity and Adrenal Insufficiency

Is Glyphosate Making Us Obese?



Regulating Fat Release



Impaired Fatty Acid Release from Fat Cells

- Hormone sensitive lipases (aka triacylglycerol lipases)
 - Release fatty acids from fat cells
 - Supply cholesterol to adrenal glands and sex glands for hormone synthesis
 - Respond to glucagon, adrenalin, dopamine, and ACTH
- Depend on multiple conserved glycines*:
 - Contain HGGG motif as “oxyanion hole”
 - Member of the class of “serine proteases” that contain a GXSXG motif essential for enzyme activity

*RC Wilmouth et al. Nat. Struct. Biol 2001;8: 689-694.

Impaired Fatty Acid Release from Fat Cells

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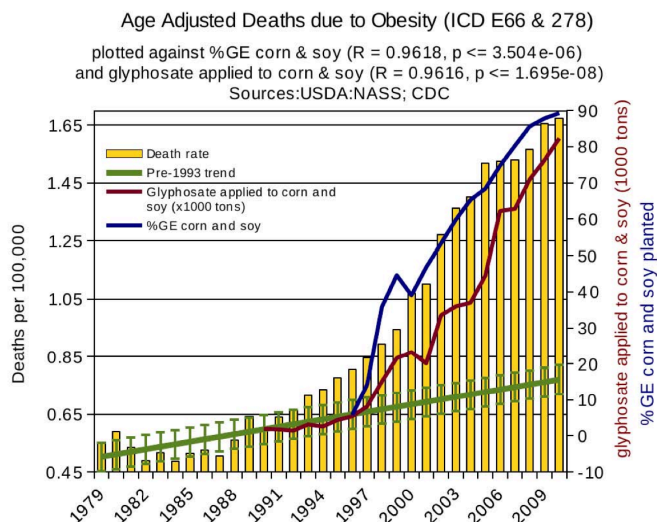
Impaired hormone sensitive lipases have been linked to obesity, atherosclerosis and type II diabetes**

- Contain HGGG motif as “oxyanion hole”
- Member of the class of “serine proteases” that contain a GXSXG motif essential for enzyme activity

**SJ Yeaman, Biochem. J. (2004) 379, 11-22.

*RC Wilmouth et al. Nat. Struct. Biol 2001;8: 689-694.

Glyphosate Usage & Death due to Obesity*



*N Swanson et al., *Journal of Organic Systems*, 9(2), 2014

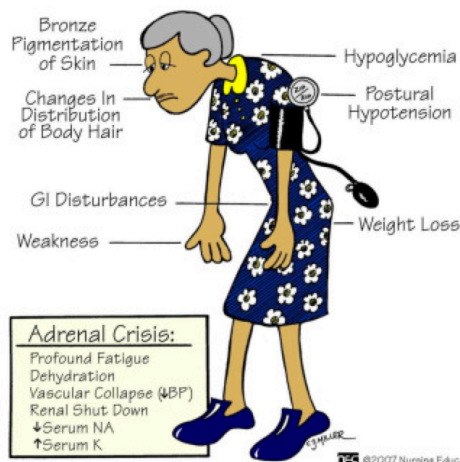
“The Association of Maternal Obesity and Diabetes With Autism and Other Developmental Disabilities”*

- 2734 children (102 ASD cases) in Boston area born between 1998 and 2014.
- Mothers with obesity and pregestational diabetes had nearly four-fold increased risk to producing a child with autism
- **My observation:** Glyphosate use on corn and soy crops correlates well temporally with all three conditions

*L Mengying et al., *Pediatrics*, February, 2016.

Adrenal Insufficiency

ADDISON'S DISEASE



Roundup has been shown to severely impair adrenal hormone synthesis*

*A Pandey and M Rudraiah, Toxicology Reports 2 (2015) 1075-1085.

Insulin Receptor & Diabetes*,**

- Glucagon release is regulated by insulin receptors (IRs)
 - When IRs are dysfunctional in mice, excess glucose is released from the liver, leading to elevated blood sugar and diabetes
- Eight repeats of a glycine-centered motif determine IR 3-D structure
- ATP-binding site contains a GXGXXG motif***

*PE Cryer, Endocrinology 2012;153(3):1039-1048.

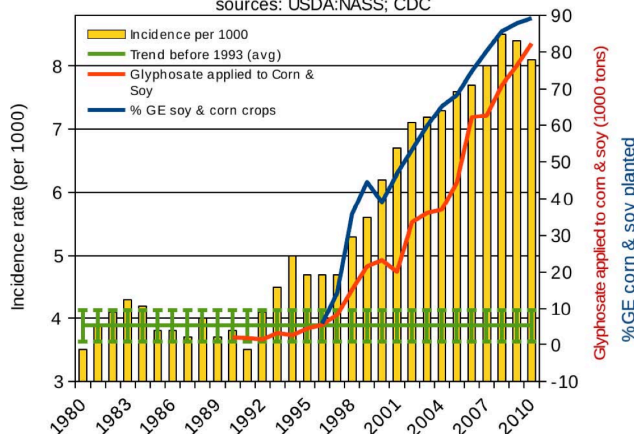
**D Kawamori et al., Cell Metab 2009;9:350-361.

***DR Knighton et al., Proc Natl Acad Sci U S A. 1993;90(11):5001-5

Diabetes and Glyphosate*

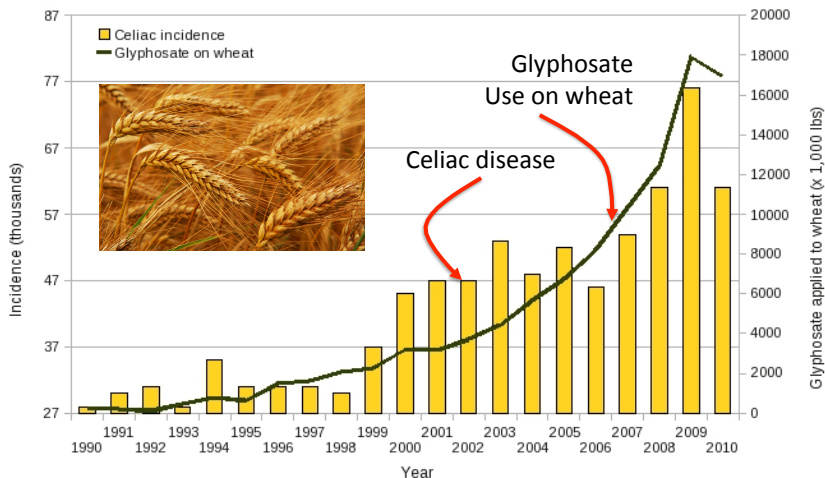
Annual Incidence of Diabetes (age adjusted)

plotted against %GE corn & soy crops planted ($R = 0.9547$, $p \leq 1.978e-06$)
 along with glyphosate applied to corn & soy in US ($R = 0.935$, $p \leq 8.303e-08$)
 sources: USDA:NASS; CDC



*Figure 14, Swanson et al. Journal of Organic Systems 2014; 9(2):6-37.

Glyphosate and Celiac Disease*



*Samsel and Seneff, Interdiscip Toxicol. 2013;6(4): 159-184.

Celiac Disease and Prolyl Aminopeptidase

- Gluten intolerance and Celiac disease result from inability to break down gluten, which is enriched in proline*
- Prolyl aminopeptidase, the enzyme that breaks down proline-containing peptides, depends on manganese as a catalyst
- Prolyl aminopeptidase also contains a highly conserved GxSxGG motif plus two other regions with conserved glycines**
- Malabsorption due to celiac disease can lead to nutritional deficiencies and symptoms of autism***

*G. Janssen et al., PLoS One 2015; 10(6): e0128065

**F Morel et al., Biochimica et Biophysica Acta 1999;1429: 501-505

***SJ Genus and TP Bouchard, J Child Neurol. 2010;25(1):114-9

Celiac Disease and Prolyl Aminopeptidase

- Gluten intolerance and Celiac disease result from inability to break down gluten, which is enriched in

Wheat is routinely sprayed right before harvest with glyphosate as a desiccant

Other treated plants include
Sugar cane, barley, peanuts, maize and legumes

nutritional deficiencies and symptoms of autism***

*G. Janssen et al., PLoS One 2015; 10(6): e0128065

**F Morel et al., Biochimica et Biophysica Acta 1999;1429: 501-505

***SJ Genus and TP Bouchard, J Child Neurol. 2010;25(1):114-9

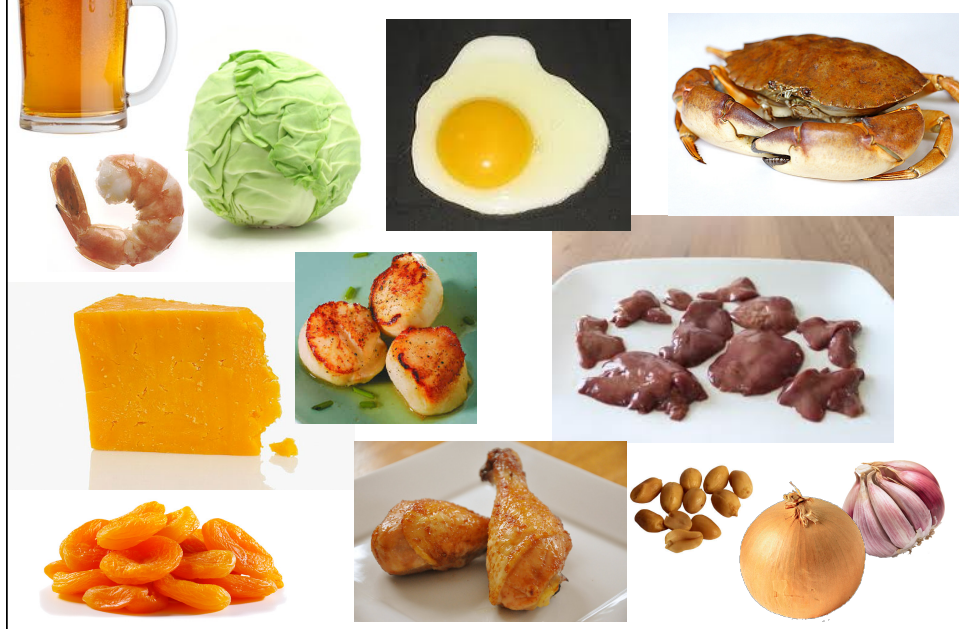
How to Safeguard Yourself and Your Family



Eat Foods Containing Manganese

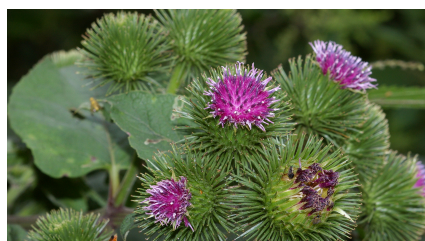


Eat Foods Containing Sulfur



Extracts from Common Plants Can Treat Glyphosate Poisoning*

- Roundup is toxic to hepatic and embryonic cells at doses far below those used in agriculture and at residue levels present in some GM food.
- Extracts from common plants such as dandelions, barberry, and burdock can protect from damage, especially if administered prior to exposure.



*C Gasnier et al. Journal of Occupational Medicine and Toxicology 2011, 6:3

Treating Glyphosate Poisoning in Animals (e.g., cows) *

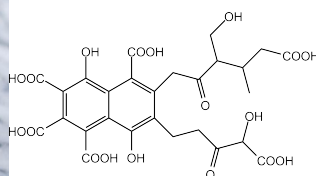


Sauerkraut Juice

Activated charcoal, bentonite clay, humic and fulvic acids, and sauerkraut juice have been shown to be effective in reducing urinary levels of glyphosate and improving animal health



Bentonite Clay



Fulvic Acid



Activated Charcoal

*H Gerlach et al., J Environ Anal Toxicol 2014, 5:2

Some Important Nutrients

- Curcumin
- Garlic
- Vitamin C
- Probiotics
- Methyl tetrahydrofolate
- Cobalamin
- Glutathione
- Taurine
- Epsom salt baths



Grass Roots Efforts

- California EPA moved to label glyphosate a "probable carcinogen"
- Richmond, California banned glyphosate usage on public land
- Tony Mitra, an activist in Canada, proposes that people should pressure the mayors of their municipalities into testing glyphosate levels in water and food products.*



* See: <http://www.tonu.org/2016/04/26/glyphosate-update/>

You need government approval to grow and sell your food as "organic," the way food has been produced for thousands of years.

USDA ORGANIC

The government requires you to label it with their symbol.

You don't need any government approval to grow and sell your food produced with modern-day chemicals and GMOs.

GMO

You don't need to label it.

Is something wrong here?

Learn more at:
Health Impact News - www.HealthImpactNews.com

Summary

- Glyphosate is the most damaging chemical in our environment today
 - We have been grossly misled into believing that it is non-toxic to humans
- The strong correlations between glyphosate usage on core crops and the alarming rise in the incidence of a long list of diseases are supported by evidence of harm
- Glyphosate's toxicity is easily explained by its biological mechanisms, particularly its potential ability to substitute for glycine during protein synthesis
 - Its effects are insidious and cumulative
- We need to switch to sustainable organic agriculture and ban glyphosate across the globe