



**“Living Soil” —The Foundation to  
Your Homestead**

Caveat/Warning

**HUGE, BROAD  
Topic!!!**

- We'll just "Scratch the Surface"
- This science is evolving and current "theories" may change

# Three Objectives Today

- Why Soil is Important
- Difference Between Dirt and Soil
- How to turn Dirt into Soil





# 30 YEARS (1985-2015)

- Technology to solve problems



"More than a terrific movie—it's an important movie."

—Owen Gleiberman, *Entertainment Weekly*

YOU'LL NEVER LOOK AT DINNER  
THE SAME WAY AGAIN



# FOOD, INC.

A ROBERT KENNER FILM

MAGNOLIA PICTURES, ANIMAPACT MEDIA, AND RIVER ROAD ENTERTAINMENT PRESENT A FILM BY ROBERT KENNER "FOOD, INC." WITH DAVID ADLER, KEN ROBERTS,  
AND RICHARD PEARCE. EXECUTIVE PRODUCERS ERIC SCHLOSSER, RICHARD PEARCE, MELISSA ROBERTS, PRODUCED BY WILLIAM FURKHOFF, RICHARD SCHULTZ, JEFF SKILL, DAWN WYERMAN  
WRITTEN AND DIRECTED BY ROBERT KENNER. CASTING BY DAVID ADLER. COSTUME DESIGNER JENNIFER BROWN. HAIR BY JESSICA BROWN. MAKEUP BY JESSICA BROWN.  
PRODUCTION DESIGNER JESSICA BROWN. EXECUTIVE PRODUCERS ERIC SCHLOSSER, RICHARD PEARCE, MELISSA ROBERTS, PRODUCED BY WILLIAM FURKHOFF, RICHARD SCHULTZ, JEFF SKILL, DAWN WYERMAN  
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www.FoodIncMovie.com www.kennerfilms.com  
Dolby Digital Stereo in English  
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www.kennerfilms.com

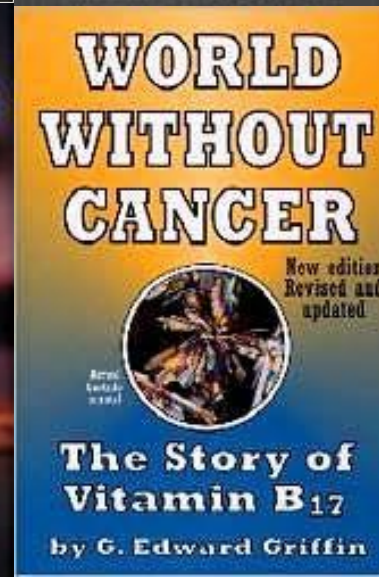
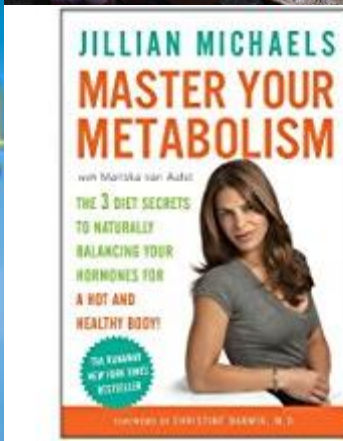
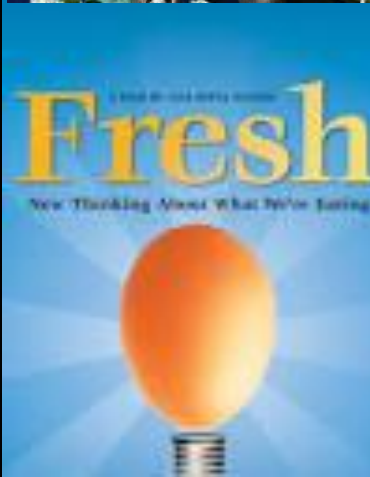
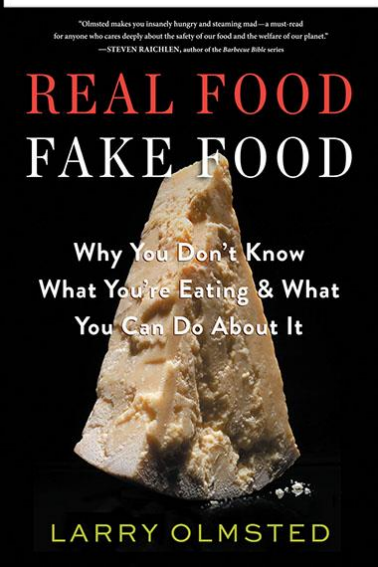
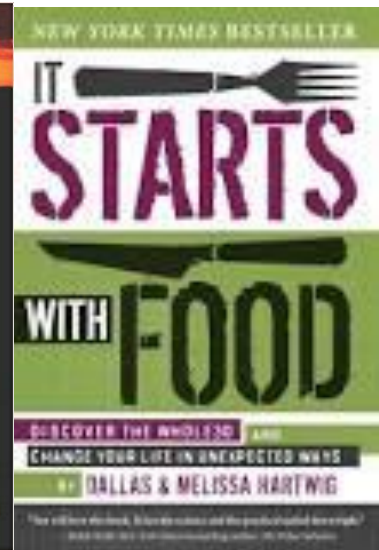
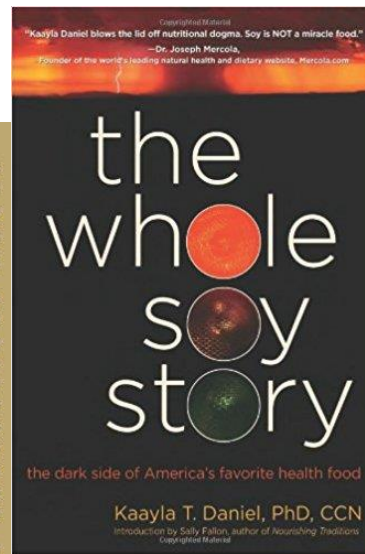
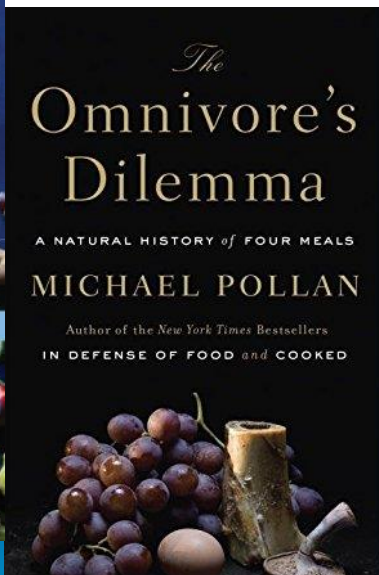
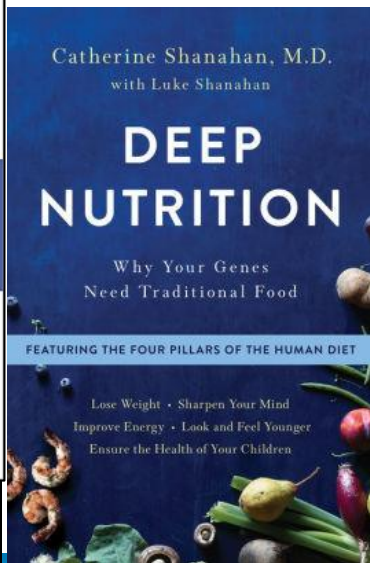
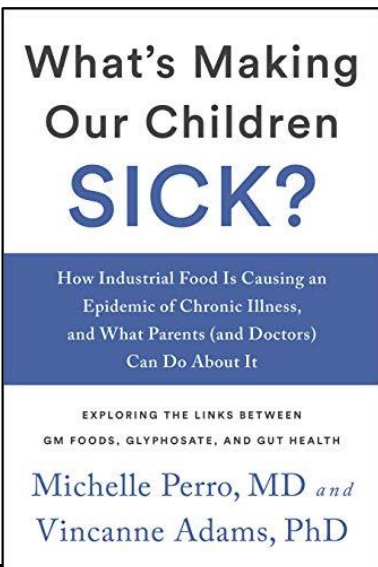


# Joel Salatin—Polyface Farm



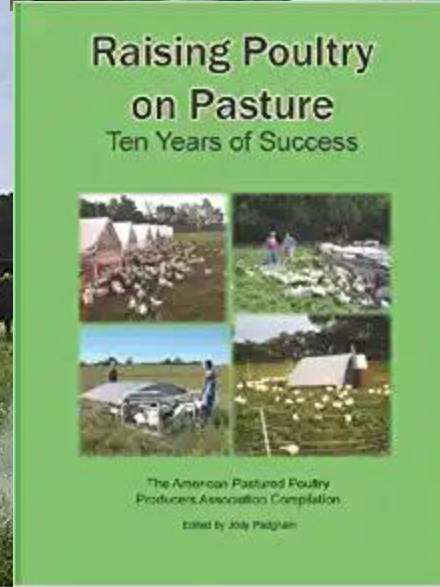
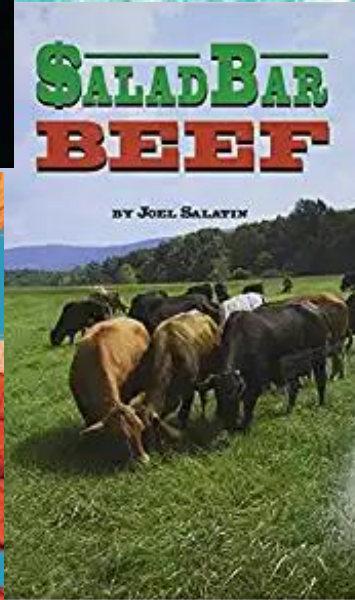
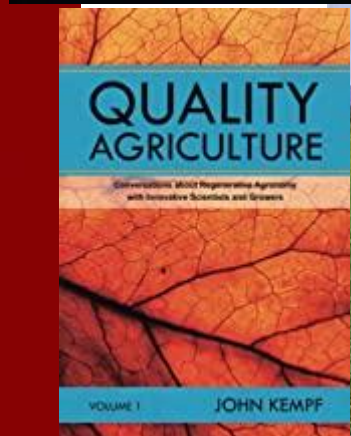
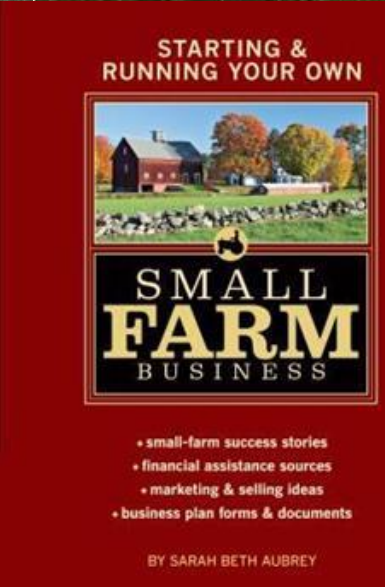
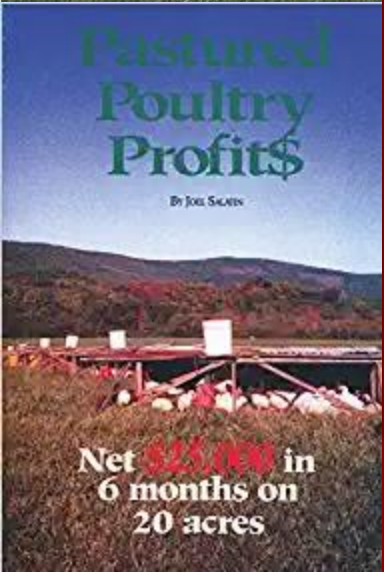
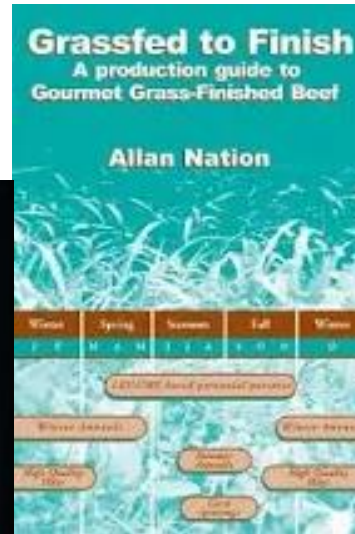
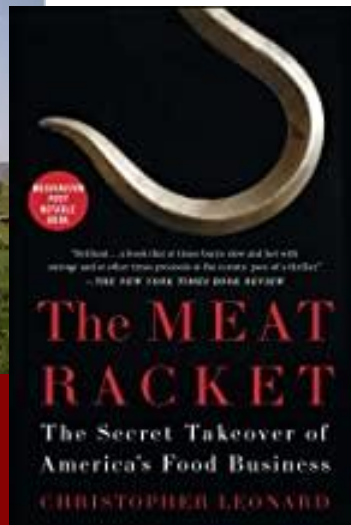
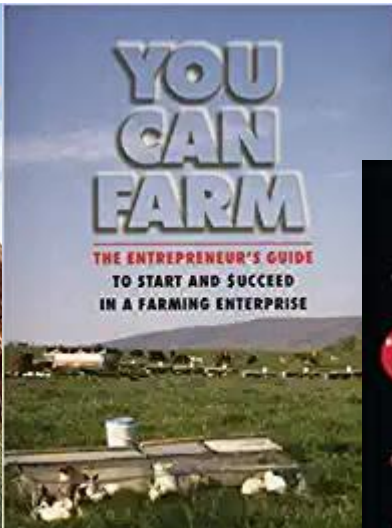
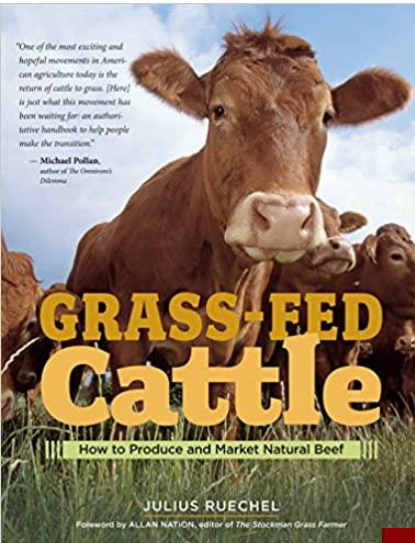


# 2008 and Every Day Since...





# Let's Start a Farm!









# Be Skeptical

“Without data, you’re just another person with an opinion”

W. Edward Deming



# Hmmm..."Blinders" Came Off!

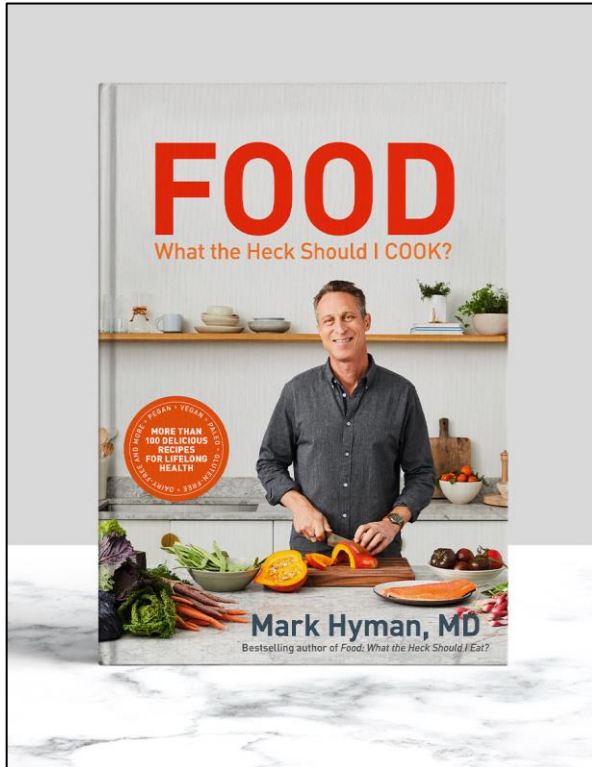
- "Diseases" never heard of as a kid
  - Obesity, Autism, Alzheimers, Parkinsons, Dementia, Diabetes, Cancer, Leaky Gut Syndrome, Irritable Bowel Syndrome, Celiac, Crohn's, Autoimmune Illnesses, Restless Leg Syndrome, Chronic Dry Eye, etc, etc.
- 50%+ world news adds are Medications
  - "Talk to my doctor about this drug"



# A Few Sad Statistics

- 2017: 75% of our youth 17-24 unqualified to join military
- 1965: 4% of our population had a chronic disease
  - Today 46% of our children have a chronic disease
- 2006: MS only state above 30% obesity--today 41 states
- US spent \$4.1 Trillion on healthcare in 2020
  - We spent \$4.1 Trillion on WWII (today's dollars)
  - 5+ times Defense Budget (\$778 Billion in 2020)
- What's a Trillion?? (\$1M/day for how long?)

# WHAT'S GOING ON?



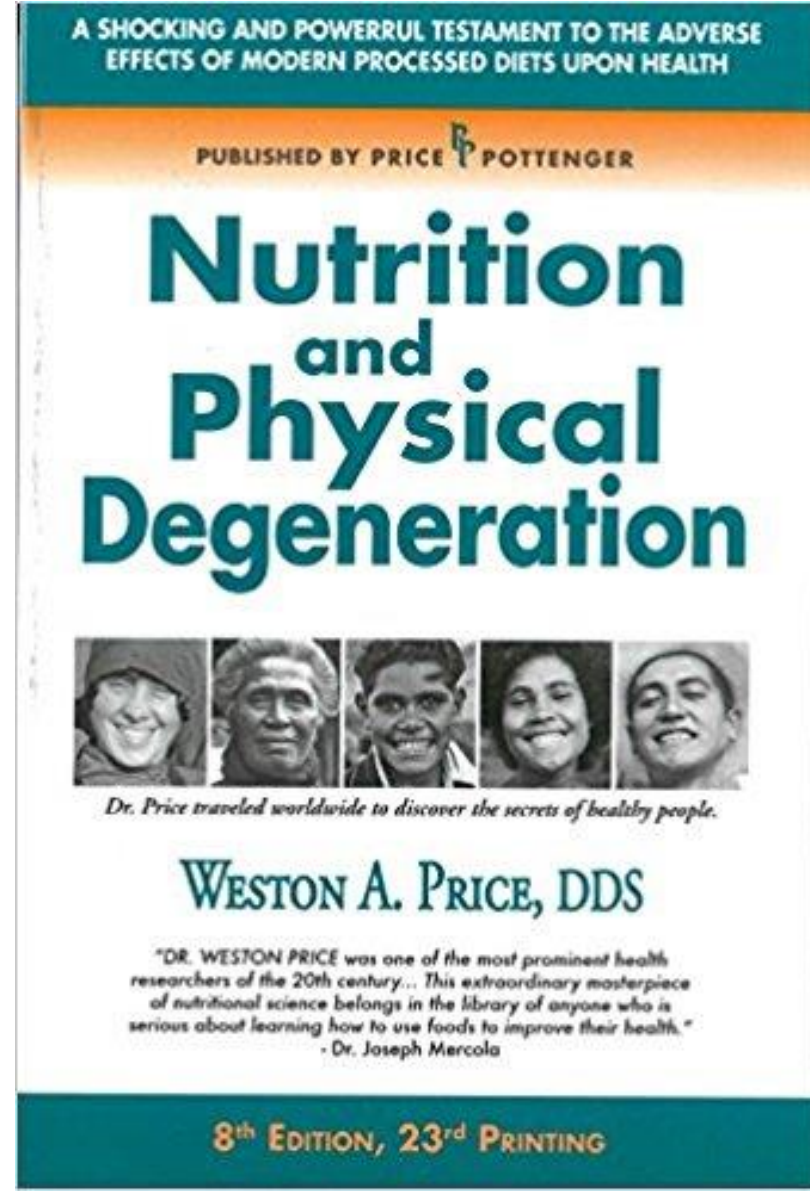
**Dr Mark Hyman “80%+ of all chronic disease is preventable” —through diet!**



# Dr Weston A. Price



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# Dr. Price's Conclusions

- NO ONE “MAGIC” FOOD!
- Healthy People ate NUTRIENT DENSE foods
  - Unprocessed; fresh fruits and vegetables; wild seafood; pasture-fed meats, raw milk, and butter; organ meat, bone broth
- Wherever exposed to “modernized/processed foods” dental decay and disease followed

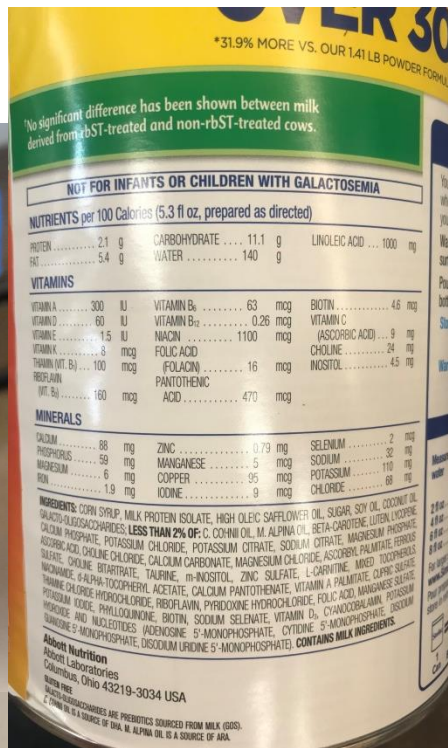
# Wise Farmer Perspective

“If it’s true you are what you eat, then at this moment, most of us and our livestock are a complicated chemical cocktail of insecticides, pesticides, fungicides, weedicides, and synthetic fertilizers.” **(AND Vaccines & Pharmaceuticals!)**

Australian Farmer Alex Podalinsky



# What's "NUTRIENT DENSE" Here?

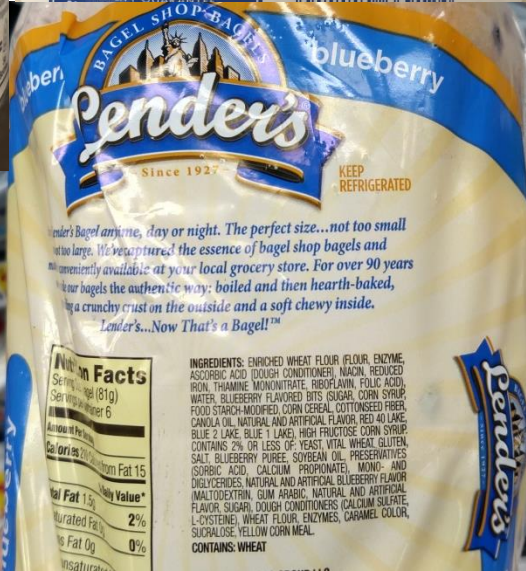
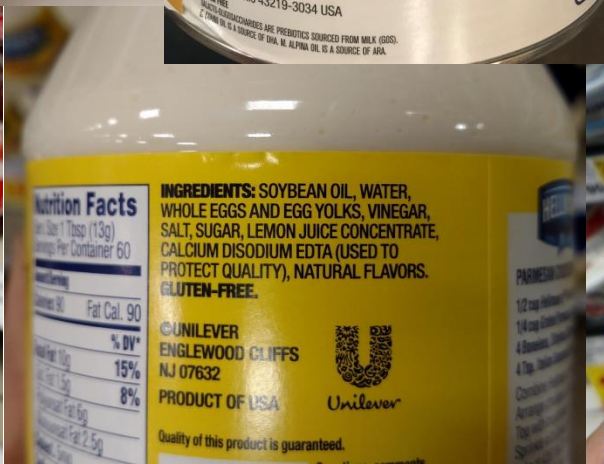


Folic Acid / Acido fólico	25%	25%
Vitamin B <sub>12</sub> / Vitamina B <sub>12</sub>	25%	35%

\* Amount in cereal: 1/2 cup skim milk adds 42 calories, 2mg cholesterol, 51mg sodium, 191mg potassium, 6g total carbohydrate (6g sugars), 4g protein. / Cantidad en cereal: 1/2 taza de leche descremada aporta 42 calorías, 2mg de colesterol, 51mg de sodio, 191mg de potasio, 6g de carbohidratos totales (6g de azúcares), 4g de proteínas.

\*\* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs: / Los porcentajes de valor diario están basados en una dieta de 2,000 calorías. Sus valores diarios pueden ser mayores o menores dependiendo de sus necesidades calóricas:

	Calories / Calorías	2,000	2,500
Total Fat / Grasa Total	Less than / Menos de	65g	80g
Saturated Fat / Grasa Saturada	Less than / Menos de	20g	25g
Cholesterol / Colesterol	Less than / Menos de	300mg	300mg
Sodium / Sodio	Less than / Menos de	2,400mg	2,400mg
Potassium / Potasio		3,500mg	3,500mg
Total Carbohydrate / Carbohidratos Totales		300g	375g
Dietary Fiber / Fibra Dietética		25g	30g



**Ingredients:** Milled corn, sugar, contains 2% or less of malt flavor, salt, BHT for freshness.

**Vitamins and Minerals:** Iron, vitamin C (ascorbic acid and sodium ascorbate), niacinamide, vitamin B<sub>6</sub> (pyridoxine hydrochloride), vitamin B<sub>2</sub> (riboflavin), vitamin B<sub>1</sub> (thiamin hydrochloride), vitamin A palmitate, vitamin D, vitamin B-12.

**CORN USED IN THIS PRODUCT MAY CONTAIN TRACES OF SOYBEANS.**



**INGREDIENTS:** APPLES, HIGH FRUCTOSE CORN SYRUP, WATER, ASCORBIC ACID (VITAMIN C).

MOTT'S LLP, 5301 LEGACY DRIVE, PLANO, TX 75024.  
©2017 MOTT'S LLP

Made from real fruit which may contain seeds, stems or other pieces of natural fruit.

MADE FROM 100% REAL FRUIT





**NUTRIENTS (Normal Dilution); per 100 Calories (5 fl oz)**

PROTEIN	g	2.3	WATER	g	133
FAT	g	5.3	LINOLEIC ACID	mg	780
CARBOHYDRATE	g	10.8			

**VITAMINS**

A	IU	300	NIACIN	mcg	1000
D	IU	70	FOLIC ACID	mcg	500
E	IU	2	PANTOTHENIC ACID	mcg	16
K	mcg	9	BIOTIN	mcg	3
THIAMIN (B1)	mcg	80	C ASCORBIC ACID	mg	72
RIBOFLAVIN (B2)	mcg	140	CHOLINE	mg	24
VITAMIN B6	mcg	60	INOSITOL	mg	80
B12	mcg	0.3			

**MINERALS**

CALCIUM	mg	82	COPPER	mcg	75
PHOSPHORUS	mg	46	IODINE	mcg	15
MAGNESIUM	mg	8	SELENIUM	mcg	2.8
IRON	mg	1.8	SODIUM	mg	40
ZINC	mg	1	POTASSIUM	mg	108
MANGANESE	mcg	15	CHLORIDE	mg	63

**INGREDIENTS:** CORN SYRUP SOLIDS, PARTIALLY HYDROLYZED NONFAT MILK AND WHY PROTEIN CONCENTRATE SOLIDS (SOY), VEGETABLE OIL (PALM OLEIN, COCONUT OIL, AND HIGH OLEIC SUNFLOWER OILS), AND LESS THAN 2% 2'-FLUCOSYLACTOSE\*\*, MORTIERELLA ALPINA OIL†, SCHIZOCHYTRIUM SP. OIL‡, CALCIUM CARBONATE, SODIUM CITRATE, CALCIUM PHOSPHATE, POTASSIUM CHLORIDE, MAGNESIUM PHOSPHATE, FERROUS SULFATE, ZINC SULFATE, COPPER SULFATE, MANGANESE SULFATE, POTASSIUM IODIDE, SODIUM SELENITE, CHOLINE CHLORIDE, INOSITOL, ASCORBIC ACID, NIACINAMIDE, CALCIUM PANTOTHENATE, RIBOFLAVIN, THIAMIN HYDROCHLORIDE, VITAMIN D3, VITAMIN B6 HYDROCHLORIDE, FOLIC ACID, VITAMIN K1, BIOTIN, VITAMIN B12, VITAMIN A ACETATE, VITAMIN A PALMITATE, SOY LECITHIN, TAURINE, L-CARNITINE.

**MEAD JOHNSON & COMPANY, LLC, EVANSVILLE, IN 47721 U.S.A.**

**NO significant difference has been shown between milk derived from rBST-treated and non-rBST-treated cows**  
\*Ingredients not genetically engineered

**NOT FOR INFANTS OR CHILDREN WITH GALACTOSEMIA**

**NUTRIENTS per 100 Calories (5 fl oz, prepared as directed)**

PROTEIN	g	2.1	CARBOHYDRATE	g	10.9	LINOLEIC ACID	mg	800
FAT	g	5.4	WATER	g	133			

**VITAMINS**

VITAMIN A	300 IU	VITAMIN B1	60 mcg	BIOTIN	4.4 mcg
VITAMIN D	60 IU	VITAMIN B2	105 mcg	VITAMIN C	72 mg
VITAMIN E	15 IU	NIACIN	1050 mcg	ASCORBIC ACID	72 mg
VITAMIN K	9 mcg	FOLIC ACID	50 mcg	CHOLINE	24 mg
THIAMIN (B1)	80 mcg	FOLIC ACID	15 mcg	INOSITOL	80 mg
RIBOFLAVIN (B2)	140 mcg	ACID	450 mcg		

**MINERALS**

CALCIUM	84 mg	ZINC	0.75 mg	SELENIUM	2.8 mcg
PHOSPHORUS	56 mg	MANGANESE	5 mcg	SODIUM	40 mg
MAGNESIUM	6 mg	COPPER	90 mcg	CHLORIDE	63 mg
IRON	1.8 mg	IODINE	15 mcg		

**INGREDIENTS:** CORN SYRUP, MILK PROTEIN ISOLATE, HIGH OLEIC SAFFLOWER OIL, SUGAR, SOY OIL, COCONUT OIL, LESS THAN 2% O.P.C. COHNI OIL, M. ALPINA OIL, 2'-FLUCOSYLACTOSE\*, SHORT-CHAIN FATTY ACID ESTERS, SOY LECITHIN, NIACIN, POTASSIUM CHLORIDE, SODIUM CITRATE, CALCIUM PHOSPHATE, POTASSIUM IODIDE, SODIUM SELENITE, CHOLINE CHLORIDE, INOSITOL, ASCORBIC ACID, NIACINAMIDE, CALCIUM PANTOTHENATE, RIBOFLAVIN, THIAMIN HYDROCHLORIDE, VITAMIN D3, VITAMIN B6 HYDROCHLORIDE, FOLIC ACID, VITAMIN K1, BIOTIN, VITAMIN B12, VITAMIN A ACETATE, VITAMIN A PALMITATE, SOY LECITHIN, TAURINE, L-CARNITINE.

**Abbott Nutrition**  
Abbott Laboratories  
Chicago, Ohio 43219-3034 USA

**INGREDIENTS:** CORN SYRUP SOLIDS (47%), VEGETABLE OIL (OLEIN, COCONUT, SOY, AND HIGH OLEIC SUNFLOWER OILS), CASEIN HYDROLYSATE (MILK) (17%), MODIFIED CORN STARCH AND LESS THAN 2% MORTIERELLA ALPINA OIL†, SCHIZOCHYTRIUM OIL‡, LACTOBACILLUS RHAMNOSUS\*\*, CALCIUM CITRATE, CALCIUM PHOSPHATE, POTASSIUM CHLORIDE, POTASSIUM CITRATE, SODIUM CITRATE, CALCIUM HYDROXIDE, MAGNESIUM OXIDE, FERROUS SULFATE, ZINC SULFATE, COPPER SULFATE, MANGANESE SULFATE, SODIUM SODIUM SELENITE, CHOLINE CHLORIDE, ASCORBIC ACID, NIACIN, RIBOFLAVIN, VITAMIN B6 HYDROCHLORIDE, FOLIC ACID, VITAMIN B12, VITAMIN A ACETATE, L-CYSTEINE, L-TYROSINE, L-TRYPTOPHAN, TAURINE, L-CARNITINE.

**MEAD JOHNSON & COMPANY, LLC**  
**EVANSVILLE, IN 47721 U.S.A.**

\*MODIFIED TO BE BETTER TOLERATED IN MILK-ALLERGIC BABIES  
\*\*A SOURCE OF ARACHIDONIC ACID (ARA)  
\*\*A SOURCE OF DOCOSAHEXAENOIC ACID (DHA)

†BRANDED AS LGG®, A REGISTERED TRADEMARK OF CHR. HANSEN A/S

Filed by weight, not by volume, may occur.

Makes 139 fl oz

00871 23945

**USE BEFORE DATE ON BOTTOM OF CAN.**

**INGREDIENTS:** CORN SYRUP, SOY PROTEIN ISOLATE, PALM OLEIN, SOY OIL, COCONUT OIL, HIGH OLEIC (SAFFLOWER OR SUNFLOWER) OIL, LESS THAN 2% MORTIERELLA ALPINA OIL†, CRYPTOSPORIDIUM COHNI OIL‡, LUTEIN, FRUCTOOLIGOSACCHARIDE, CALCIUM PHOSPHATE, POTASSIUM CITRATE, POTASSIUM CHLORIDE, MAGNESIUM CHLORIDE, SODIUM CITRATE, ASCORBIC ACID, CHOLINE BICARBONATE, L-METHIONINE, TAURINE, ASCORBYL PALMITATE, FERROUS SULFATE, INOSITOL, MIXED TOCOPHEROLS, CALCIUM ZINC SULFATE, VITAMIN E (d-ALPHA-TOCOPHERYL ACETATE), L-CARNITINE, NIACINAMIDE, RIBOFLAVIN, PYRIDOXINE HYDROCHLORIDE, FOLIC ACID, POTASSIUM IODIDE, POTASSIUM HYDROXYBENZOATE, VITAMIN K1 (PHYTONADIONE), BIOTIN, SODIUM SELENITE, BETA-CAROTENE, VITAMIN D3 (CHOLECALCIFEROL), CHOLECALCIFEROL, MONOGLYCERIDES, SOY LECITHIN, TRIBASIC CALCIUM PHOSPHATE, CALCIUM CARBONATE, MANGANESE SULFATE, POTASSIUM BICARBONATE.

DILUTED: EACH 5 FL OZ (150 mL) CONTAINS 100 CALORIES

**NUTRIENTS PER 100 CALORIES:**

PROTEIN g	2.45	BIOTIN mcg	4.7
FAT g	5.46	VITAMIN C (ASCORBIC ACID) mg	72
CARBOHYDRATE g	10.4	CHOLINE mg	24
WATER g	133	INOSITOL mg	80
LINOLEIC ACID mg	800	MINERALS:	
VITAMIN A IU	300	CALCIUM mg	82
VITAMIN D IU	60	PHOSPHORUS mg	46
VITAMIN E IU	15	MAGNESIUM mg	8
VITAMIN K mcg	9	IRON mg	1.8
THIAMIN (B1) mcg	80	ZINC mg	1
RIBOFLAVIN (B2) mcg	140	MANGANESE mcg	15
VITAMIN B6 mcg	60	COPPER mcg	75
FOLIC ACID mcg	50	IODINE mcg	15
NIACIN mcg	1050	SELENIUM mcg	2.8
ASCORBIC ACID mg	72	SODIUM mg	40
CHOLINE mg	24	POTASSIUM mg	108
INOSITOL mg	80	CHLORIDE mg	63

PREPARED BY THE ROSSER CO.  
EVANSVILLE, IN 47702

COMMENTS: 1-800-272-9005  
TOLL FREE, 24 HRS. EST. MONDAY - FRIDAY

**GLUTEN FREE**

© Contains no dairy ingredients.  
© Contains no allergen ingredients.



# Dr Arden Andersen

- Up to 38% decline in nutrients (1950-1999)
  - Protein, Ca, Vit C, P, Fe
  - USDA Data; Davis, Epp & Riordan JACN
- Avg 63% decline (1941-2001)
  - Fe, Zn, Cu, Mn, Se
  - Huling, Dec 2001; Thomas, Analysis of UK, 2003

# How Tell if Nutrient Dense?

- Taste
- Brix (Dr Carey Reams)

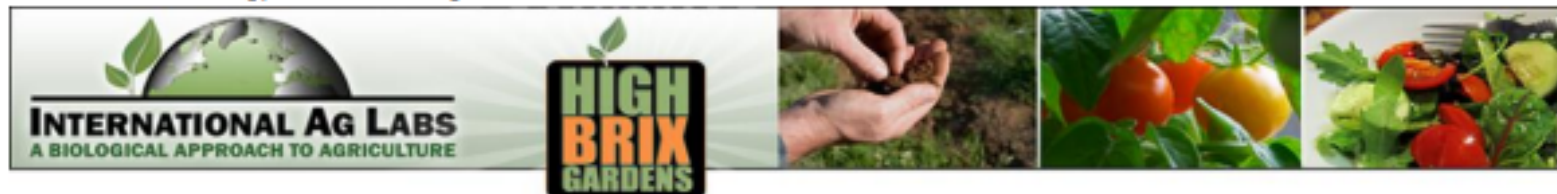


# Refractive Index of Crop Juices -- Calibrated In % Sucrose Or °Brix

	Poor	Average	Good	Excellent
<b>FRUITS</b>				
Apples	6	10	14	18
Avocados	4	6	8	10
Bananas	8	10	12	14
Blueberries	8	12	14	18
Cantaloupe	8	12	14	16
Casaba	8	10	12	14
Cherries	6	8	14	16
Coconut	8	10	12	14
Grapes	8	12	16	20
Grapefruit	6	10	14	18
Honeydew	8	10	12	14
Kumquat	4	6	8	10
Lemons	4	6	8	12
Limes	4	6	10	12
Mangos	4	6	10	14
Oranges	6	10	16	20
Papayas	6	10	18	22
Peaches	6	10	14	18
Pears	6	10	12	14
Pineapple	12	14	20	22
Raisins	60	70	75	80
Raspberries	6	8	12	14
Strawberries	6	8	12	14
Tomatoes	4	6	8	12
Watermelons	8	12	14	16
<b>GRASSES</b>				
Alfalfa	4	8	16	22
Grains	6	10	14	18
Sorghum	6	10	22	30

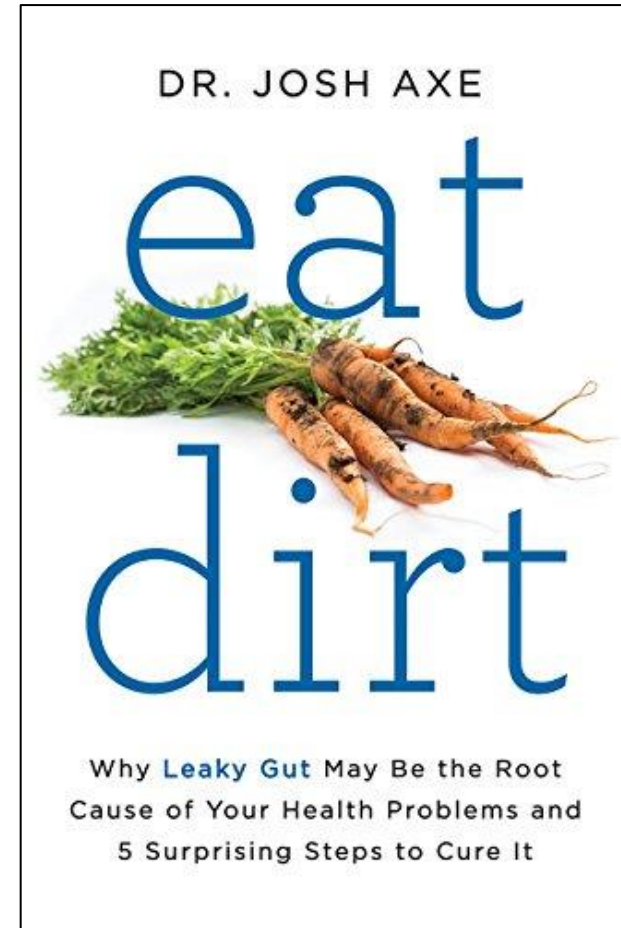
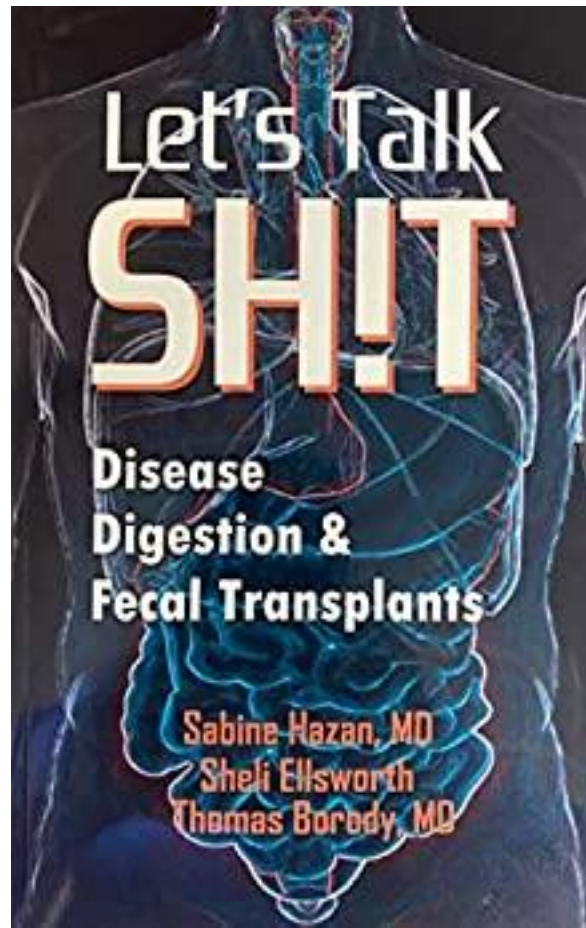
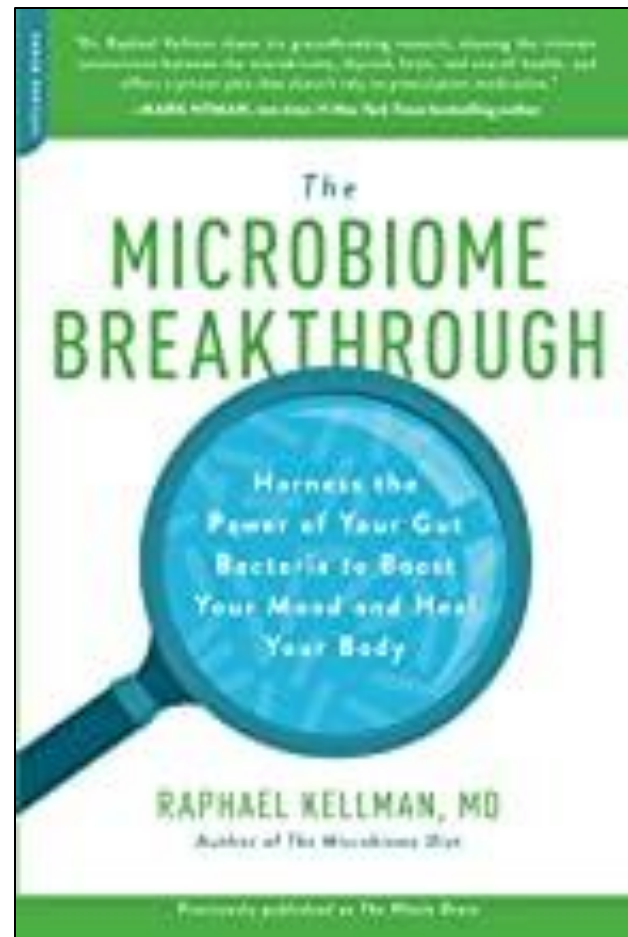
Within a given species of plant, the crop with the higher refractive index will have a higher sugar content, higher mineral content, higher protein content and a greater specific gravity or density. This adds up to a sweeter tasting, more minerally nutritious food with lower nitrate and water content, lower freezing point, and better storage attributes.

	Poor	Average	Good	Excellent
<b>VEGETABLES</b>				
Asparagus	2	4	6	8
Beets	6	8	10	12
Bell Peppers	4	6	8	12
Broccoli	6	8	10	12
Cabbage	6	8	10	12
Carrots	4	6	12	18
Cauliflower	4	6	8	10
Celery	4	6	10	12
Corn Stalks	4	8	14	20
Corn (Young)	6	10	18	24
Cow Peas	4	6	10	12
Cucumbers	2	3	4	5
Endives	4	6	8	10
English Peas	8	10	12	14
Escarole	4	6	8	10
Field Peas	4	6	10	12
Garlic, Cured	28	32	36	40
Green Beans	4	6	8	10
Hot Peppers	4	6	8	10
Kale	8	10	12	16
Kohlrabi	6	8	10	12
Lettuce	4	6	8	10
Onions	4	6	8	10
Parsley	4	6	8	10
Peanuts	4	6	8	10
Potatoes	3	5	7	8
Potatoes, Sweet	6	8	10	14
Romaine	4	6	8	10
Rutabagas	4	6	10	12
Spinach	6	8	10	12
Squash	6	8	12	14
Sweet Corn	6	10	18	24
Turnips	4	6	8	10



# 2018 Human Microbiome

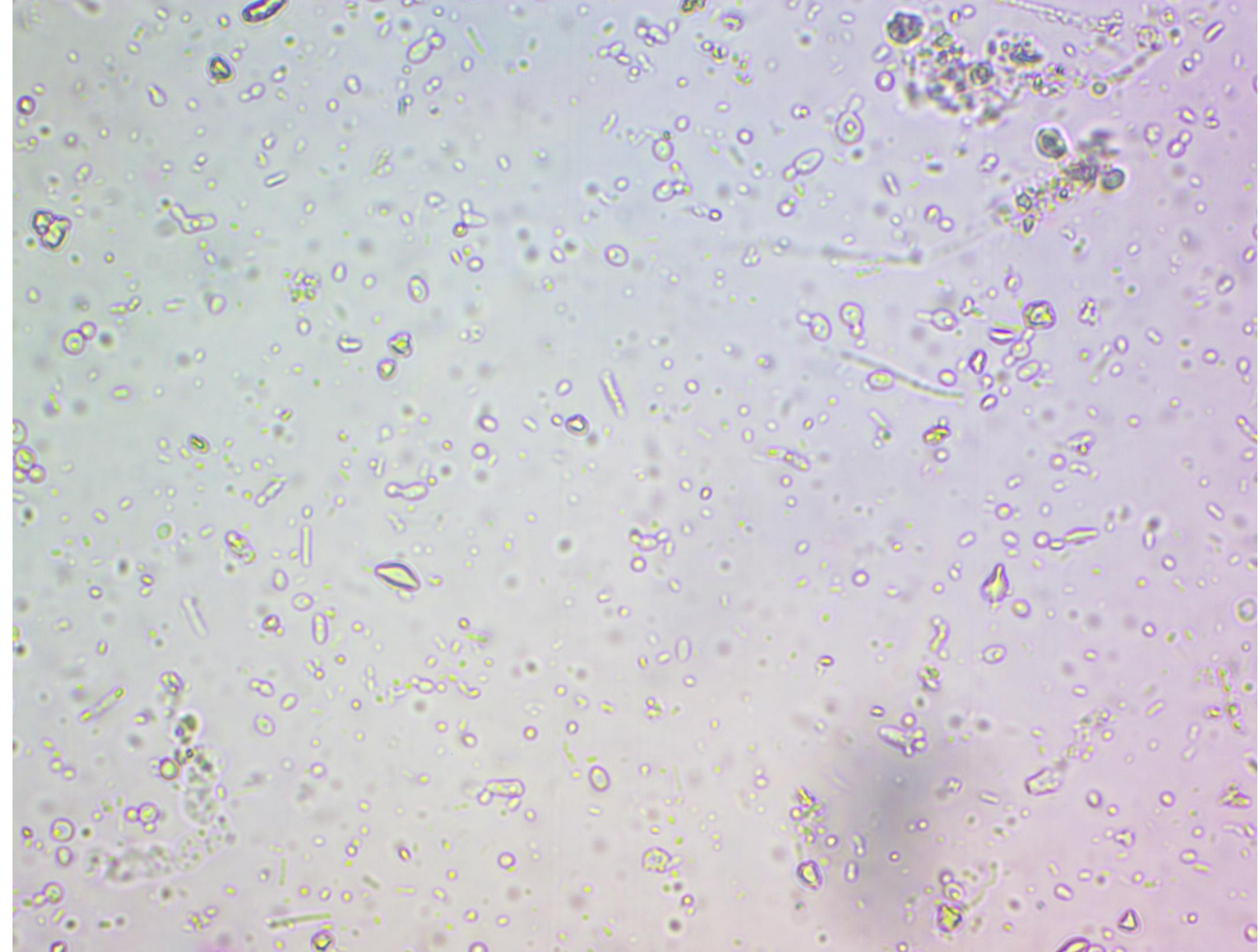
- Very Small Life—can't see with naked eye
- 10X more critters living in/on you than human cells











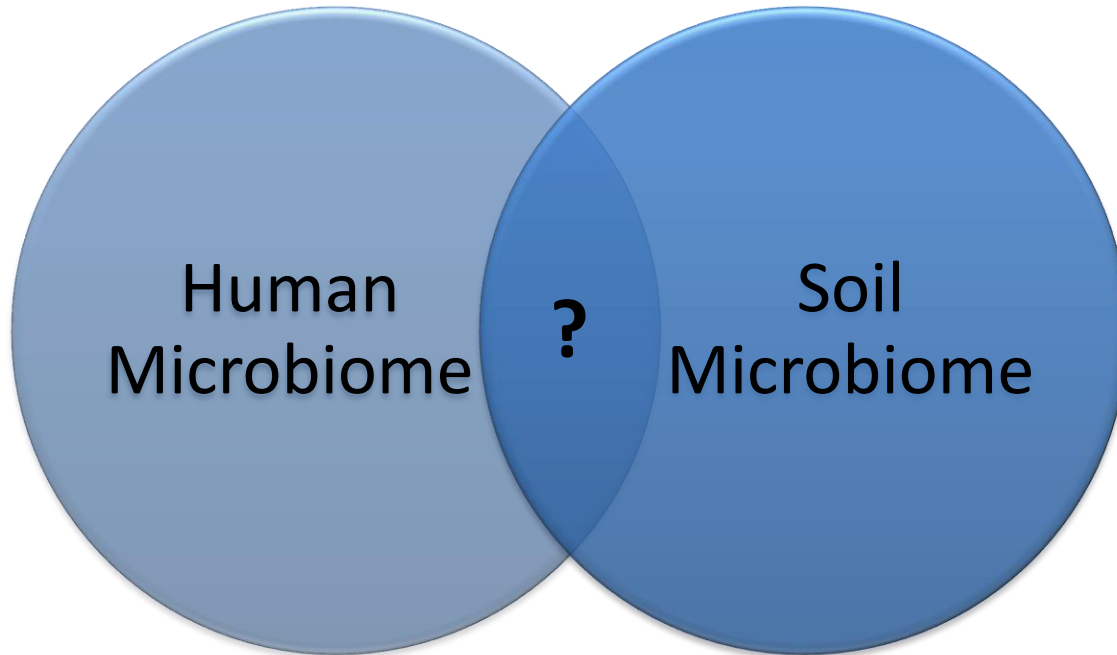
# Two Keys to Human Health

- ✓ Nutrient Dense Food
- ✓ Healthy Microbiome
- So...where do they come from?



# The Soil!

- Soil is the foundation for all life on land



# Dirt vs Soil

- Dirt—physical rocks, sand, silt & clay
- Soil—living skin of the planet
  - Handful of healthy soil has more critters in it than people on planet earth
  - Not just there for the “hell of it”



# But, Dirt's Taking Over

- Modern agriculture focused on “chemistry”
- What kills biology?
  - Excessive Tillage
  - Chemical Fertilizers (N, P, K)
  - “icides”...Herbicides & Insecticides















# Symptoms of “Dirt”

- Sick plants—reduced yield/quality
- Pests (weeds, insects, diseases)
  - Need lots of “inputs” and \$\$
- Poor water infiltration
- Erosion



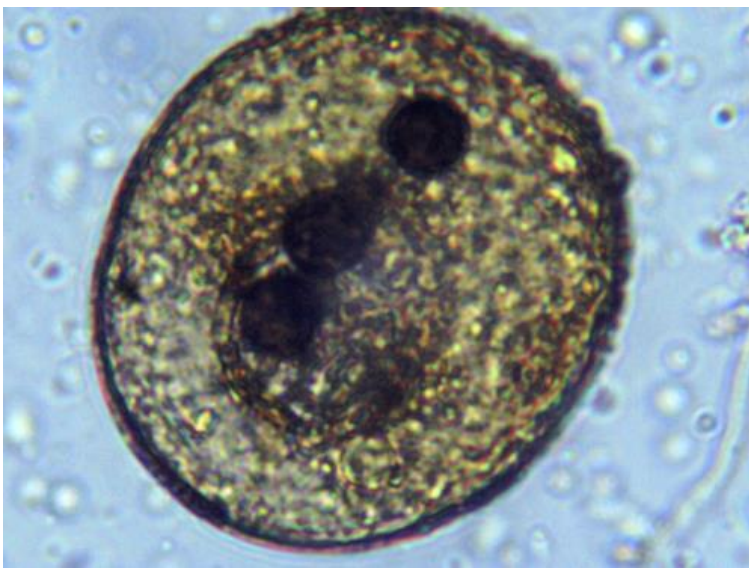
# *Seven Dead After Dust Storm Causes Crashes on Interstate 55 in Illinois*

At least 72 vehicles were involved in pileup crashes after a dust storm swept through central Illinois, forcing the closure a key highway in the region.



# Dr. Elaine Ingham (PhD in 1981)

- Soilfoodweb School
  - Fundamental Courses
  - Certified Lab-Tech
  - Consultant Training Program
    - Microbiome
    - Make biological amendments
    - Microscopy
    - Turn dirt to soil





- Chris Trump: Korean Natural Farming
- **Biology is most important ingredient**
  - N, P, K not enough...plants need all nutrients
    - Plant “blood” 1:30 dilution of sea water



# Periodic Table of the Elements

Atomic Number → **1** ← Symbol  
Name → **Hydrogen** ← Atomic Weight

State of matter (color of name):  
● LIQUID ● SOLID ● GAS

Subcategory in the metal-nonmetal diagonal band (color of background):  
■ Alkali metal ■ Alkaline earth metal ■ Metalloid ■ Noble gas  
■ Lanthanide ■ Actinide ■ Polyatomic nonmetal ■ Unknown chemical properties  
■ Transition metal ■ Post-transition metal ■ Diatomic nonmetal

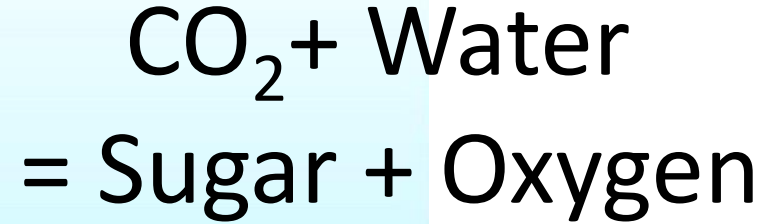
1 H																	18 He
3 Li	4 Be											9 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	86 Rn
87 Fr	88 Ra	89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr	118 Og

57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr





Photosynthesis



**(A) Root System Architecture**

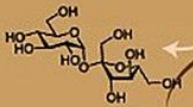
Spatially distinct communities

**(E) Bacterial associations**

**(B) Chemical Gradients**

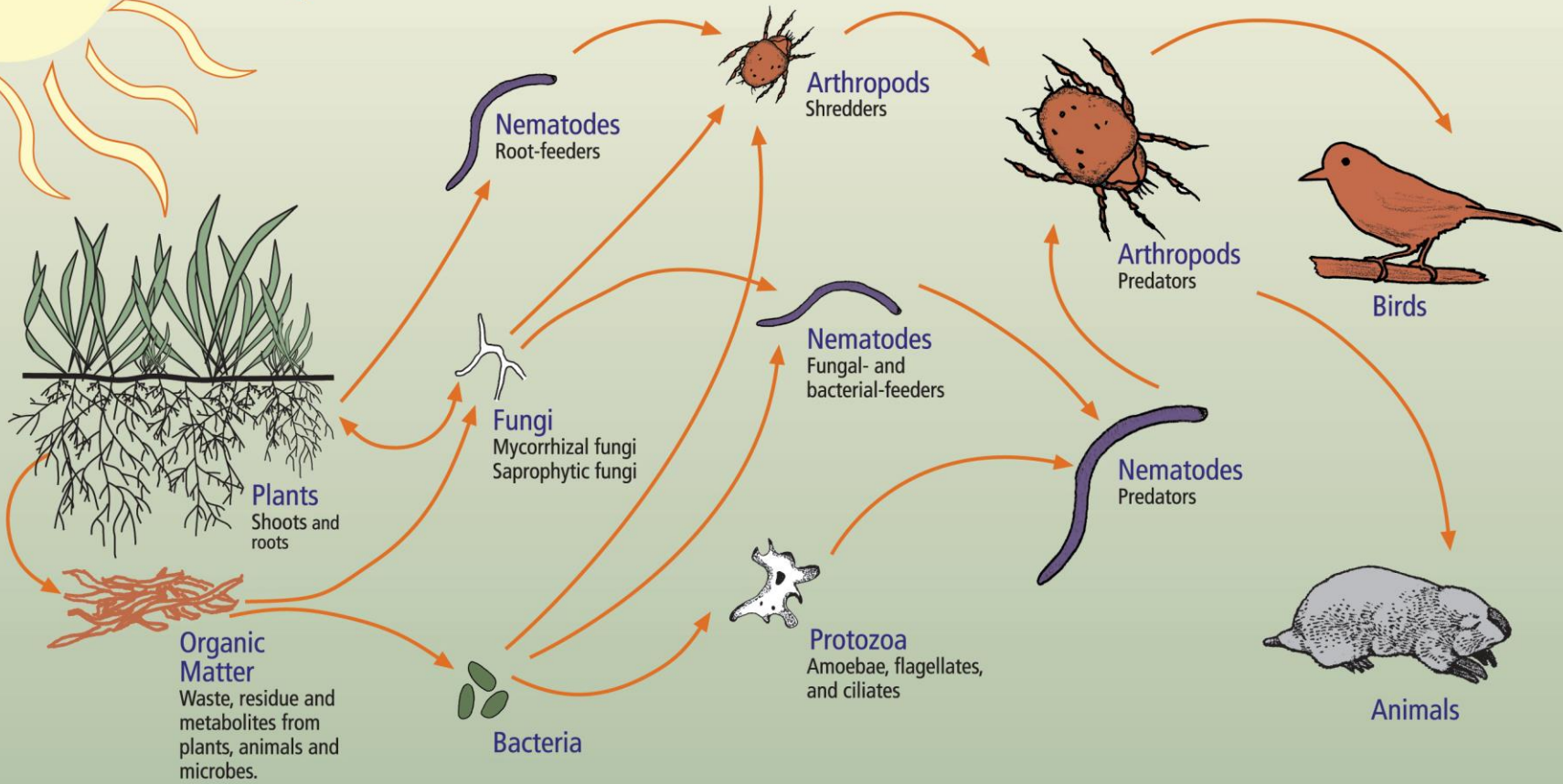
**(D) Mycorrhizal interactions**

**(C) Nematodal interactions**





# The Soil Food Web



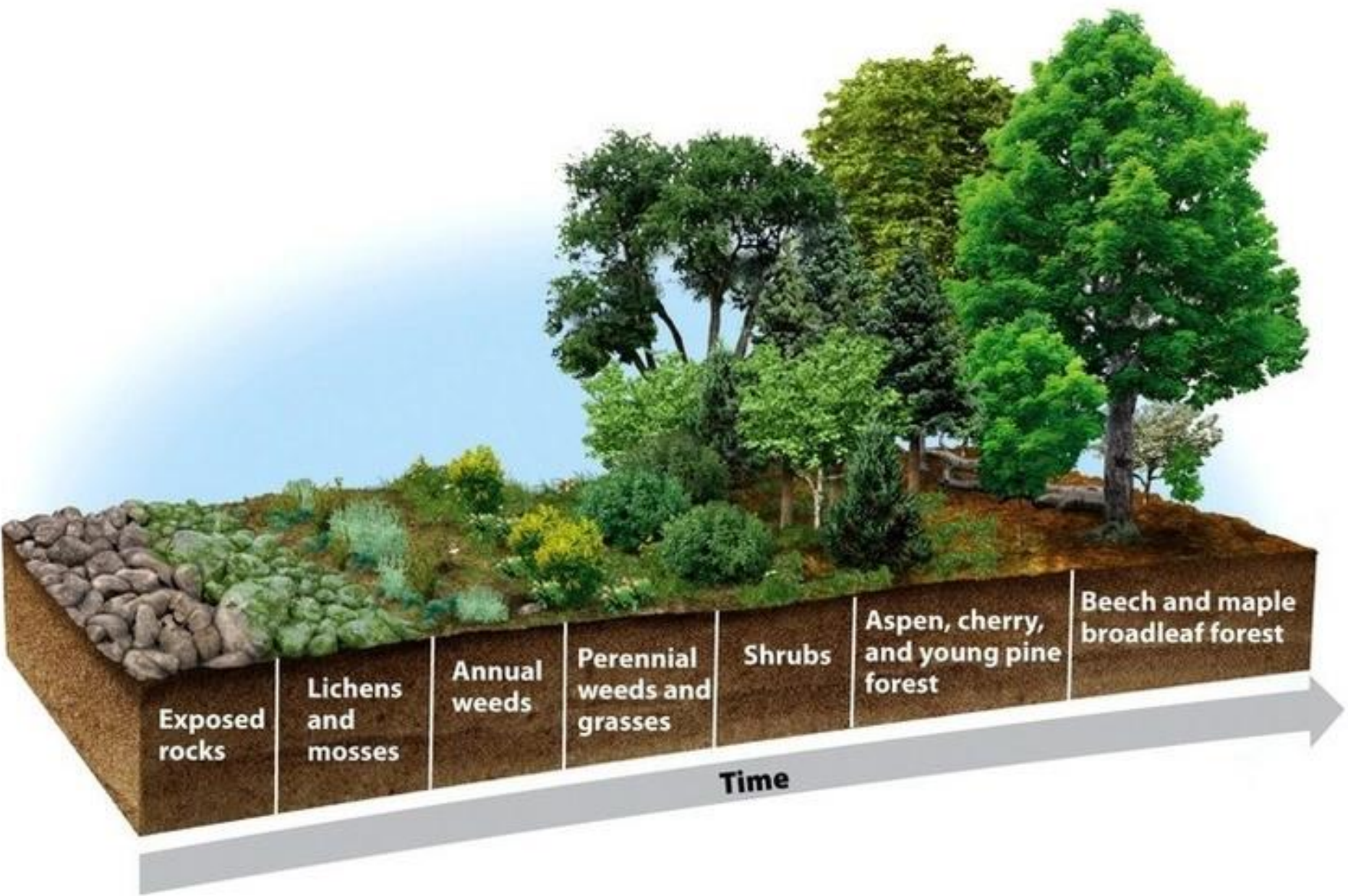
**First trophic level:**  
Photosynthesizers

**Second trophic level:**  
Decomposers  
Mutualists  
Pathogens, Parasites  
Root-feeders

**Third trophic level:**  
Shredders  
Predators  
Grazers

**Fourth trophic level:**  
Higher level predators

**Fifth and higher trophic levels:**  
Higher level predators



# Standard Soil Test

Lab Number: 602069

Sample Name: TEST2

Farm Name:

## Soil Results

pH		Phosphorus	Potassium	Calcium	Magnesium	Zinc	Iron	Manganese	Boron	Sodium
Soil pH	Buffer Value	P	K	Ca	Mg	Zn	Fe	Mn	B	Na
		Pounds per acre - Mehlich 1								
6.65		25 M	84 L	1842 S	140 S	2.3 S	17 S	20 S	0.5	12

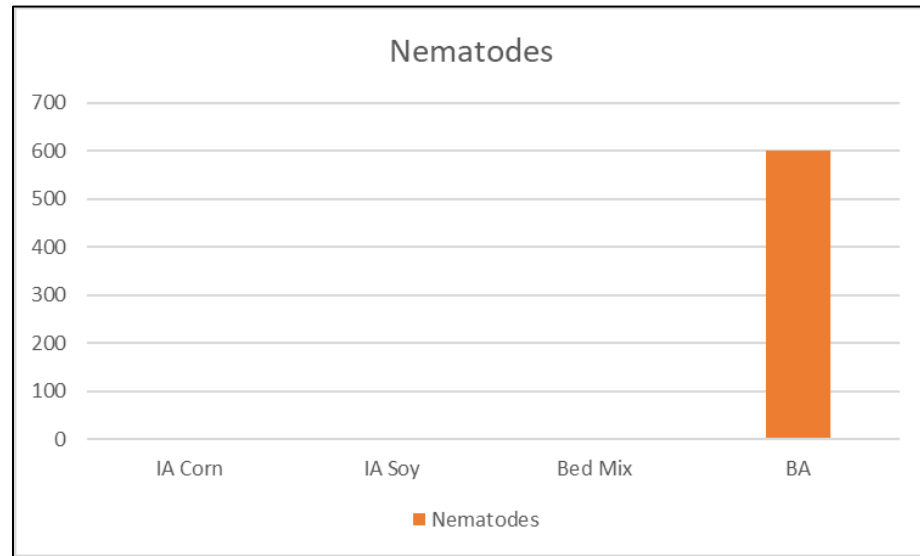
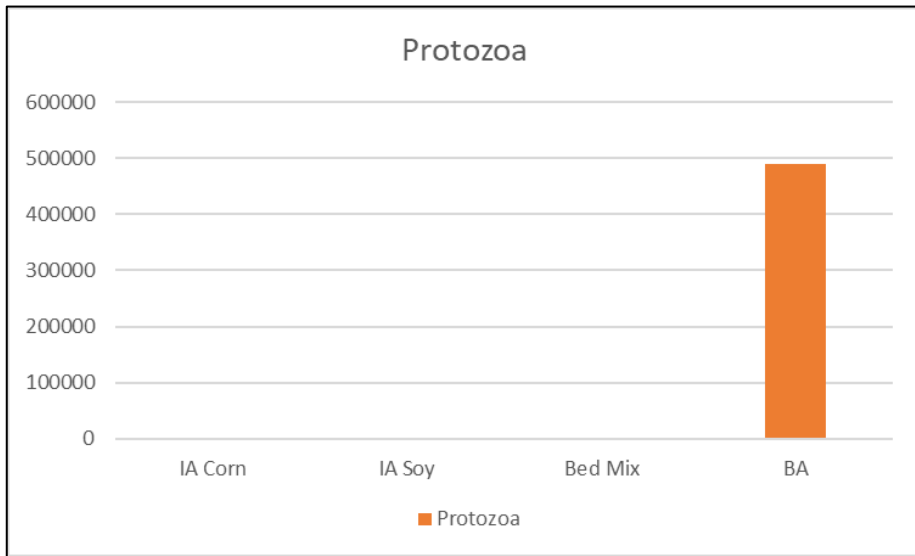
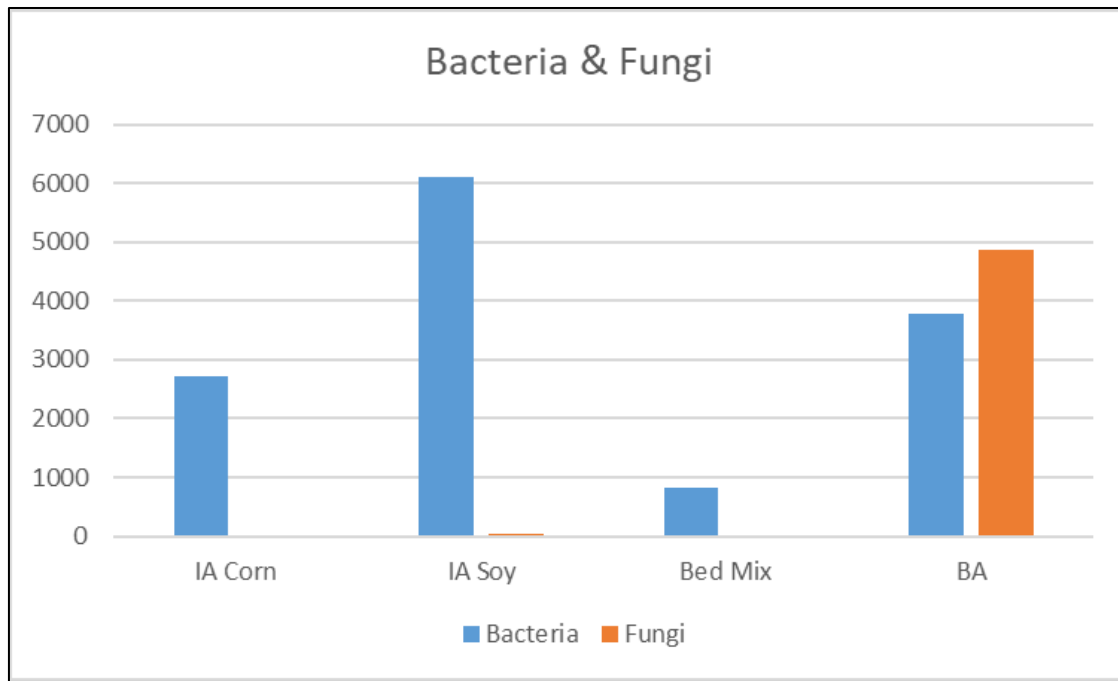
Crop/plant Interpretation ranges on last sheet

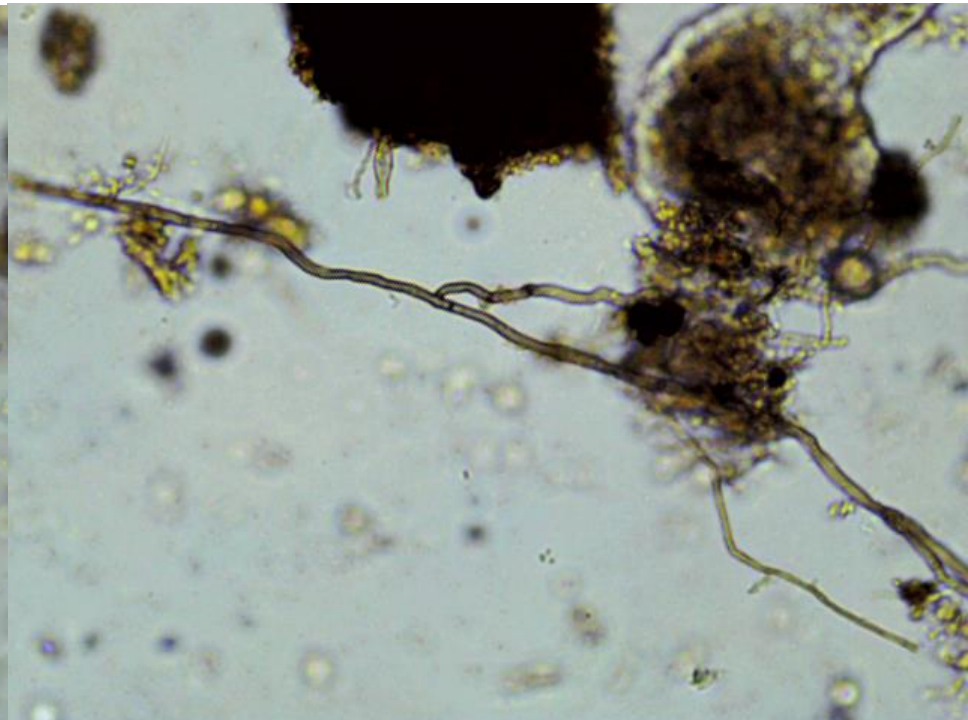
L = Low, M= Medium, H=High, V= Very High, S = Sufficient

<i>Additional tests, if they were requested</i>											
Sulfur	Nitrogen			Carbon	C/N Ratio	Organic Matter	Soluble Salts	Particle Size Analysis - Hydrometer Method			
LBS/ACRE	NH4-N ppm	NO3-N ppm	Total N %	%	%	%	dS/m	% Sand	% Silt	% Clay	Soil Texture
						3.3	0.03	20	64	16	Silt Loam



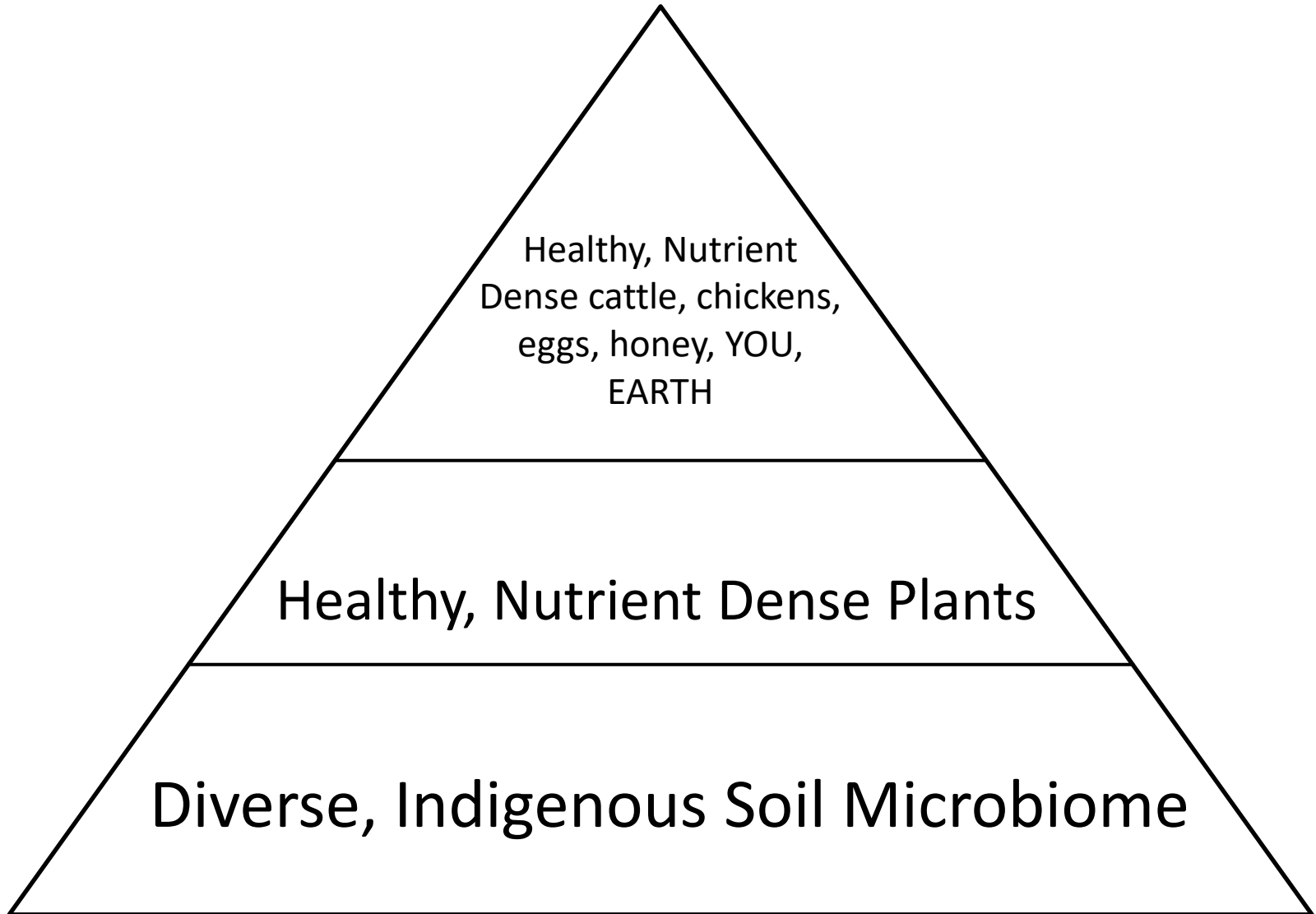
AFExtractDrenchResults_2022-04-11	
Beneficial Microorganisms	Sample Results
Bacterial Biomass ( $\mu\text{g/g}$ )	724.142
Bacterial Standard Deviation Biomass ( $\mu\text{g/g}$ )	87.835
Bacterial Standard Deviation as Percentage of Mean	12.10%
Actinobacterial Biomass ( $\mu\text{g/g}$ )	0.167
Actinobacterial Standard Deviation Biomass ( $\mu\text{g/g}$ )	0.16
Actinobacterial Standard Deviation as Percentage of Mean	95.90%
Fungal Biomass ( $\mu\text{g/g}$ )	851.77
Fungal Standard Deviation Biomass ( $\mu\text{g/g}$ )	882.451
Fungal Standard Deviation as Percentage of Mean	103.60%
Fungal Average Diameter - Weighted Mean ( $\mu\text{m}$ )	6.881
F:B Ratio	1.176
Total Beneficial Protozoa ( number/g )	136953
Flagellates ( number/g )	61629
Flagellates Standard Deviation ( number/g )	19519
Flagellates Standard Deviation as Percentage of Mean	31.70%
Amoebae ( number/g )	75324
Amoebae Standard Deviation ( number/g )	22968
Amoebae Standard Deviation as Percentage of Mean	30.50%
Bacterial-feeding Nematodes ( number/g )	21
Fungal-feeding Nematodes ( number/g )	0
Predatory Nematodes ( number/g )	0
Detrimental Microorganisms	
Oomycetes Biomass ( $\mu\text{g/g}$ )	0
Oomycetes Standard Deviation Biomass ( $\mu\text{g/g}$ )	0
Oomycete Standard Deviation as Percentage of Mean	0.00%
Oomycetes Average Diameter - Weighted Mean ( $\mu\text{m}$ )	0
Ciliates ( number/g )	3424
Ciliates Standard Deviation ( number/g )	4688
Ciliates Standard Deviation as Percentage of Mean	136.90%
Root-feeding Nematodes ( number/g )	0
Total Beneficial Protozoa Standard Deviation ( number/g )	35807
Total Beneficial Protozoa Standard Deviation as Percentage of Mean	26.10%







# The Foundation--Microbiome



# Congratulations!

✓ First Step--Awareness!!

- Most important Step!!

# Now What?

- Become a MICROBE FARMER!!
- Microbiome Needs...
  - Air
  - Water
  - Food
  - Comfort (Shelter)



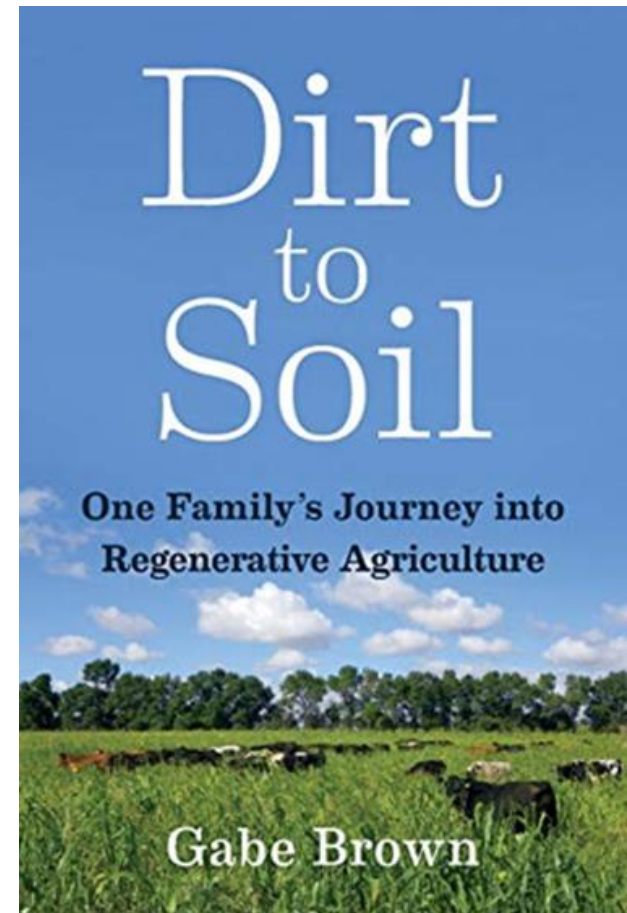






# Do This! Regenerative Agriculture

- Farming & grazing practices that:
  - Restore degraded soil microbiome
  - Rebuild soil organic matter
  - Sequester carbon
  - Restore the water cycle
- Urban Landscaping Too!!





# It's a Personal "Journey"

- Where am I (Baseline)?
  - Weeds, insect damage, poor crops/forage?
- Where want to go?...Healthy SOIL!
  - Nutrient dense plants, livestock, people, planet!
- Inventory & apply tools?
  - Knowledge, \$\$, muscle, time, livestock (rotational grazing), cover plants, microbiome

# Sources of Soil Microbiome

- Livestock & Manure
- Earth Worms
- Static Composting (Leaves, grass clippings)
- Vermicomposting (Red Wiggler Worms)
- Thermophilic Composting
- Dr David Johnson/Su Bioreactor
- Korean Natural Farming



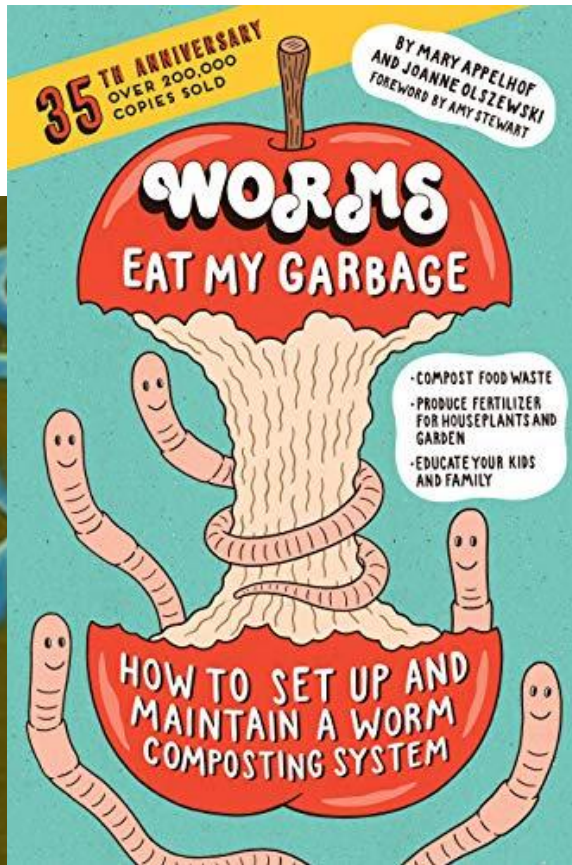


# TEAMING WITH MICROBES

The Organic Gardener's Guide to the Soil Food Web

REVISED EDITION

JEFF LOWENFELS & WAYNE LEWIS



# Compost Tea Making

For Organic Healthier Vegetables  
Flowers • Gardens • Vineyards • Lawns



Marc Remillard







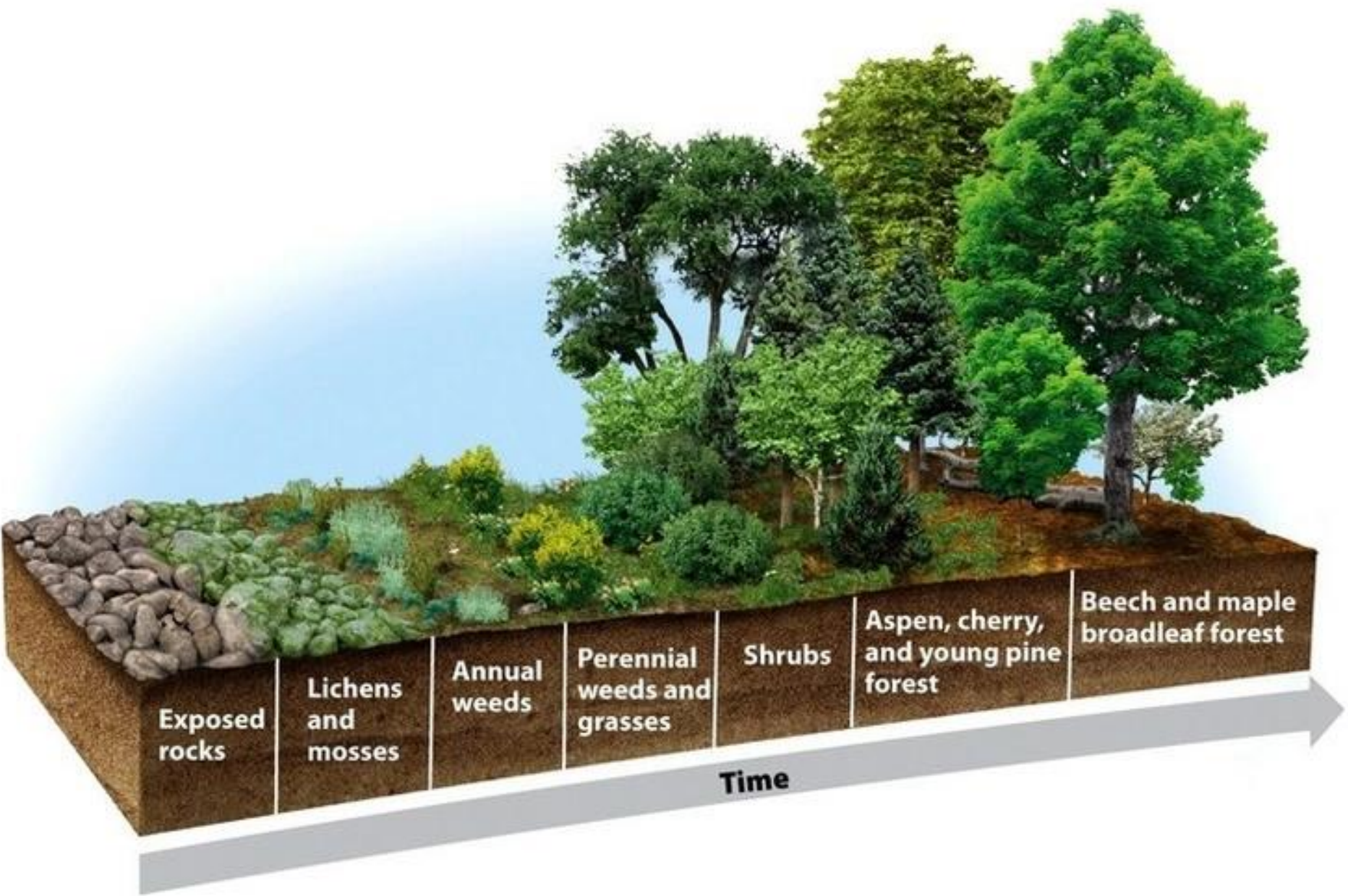
# Examples

- From Theory to Real World























# Garden





# Garden









# Pasture





# Rotational Grazing

























































# Amber Falls Winery (Hampshire TN)

































# Large Scale

- Gabe Brown—5,000 acres in ND!
- Rick Clark—7,000 acres in IN!
- York Farm—10,000 acres in IL!
  - Todd Harrington Case Study at [Soilfoodweb.com](http://Soilfoodweb.com)



David R. Montgomery



**dirt**

**The Erosion of Civilizations**



# A Life on Our Planet

*My Witness Statement and  
a Vision for the Future*

David  
Attenborough





# Unsung Heroes

- You're joining something bigger than yourself
- Our farmers/ranchers are unsung heroes
- What's more noble than growing our food?
- But, the health of your fellow citizens is in your hands



# What If?

- Chronic disease rates in our children 40%+
- Autism rates in young children 1/36+
- Obesity rates in citizens 42%+
- Cancer rates 1/2
- Affect our military age youth such that 3/4 couldn't join the military
- Spend WWII (\$4.1 Trillion+) every year



1937



“The nation that  
destroys its soil  
destroys itself.”



# Soil “Oath”

“To the best of my ability, I vow to help promote and build soil instead of dirt”



**A NEW  
BEGINNING!**



# More Info

- Website: Libertytracefarm.com
  - Book/Resource Tab
  - Classes on website & Social Media
- Weston Price Foundation (#7)  
(<https://www.westonaprice.org/>)
- Childrens Health Defense (#58)  
(<https://childrenshealthdefense.org/>)
- Howard Vlieger, Contact Organics (#16)