



Restoring the "Medicine" to our Modern Diet

Jo Robinson



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Vashon Island



Hippocrates: Let food be thy medicine and medicine be thy food.



- Since we first became farmers 12,000 years ago, we have—unwittingly—greatly reduced the **phytonutrient** content of our fruits and vegetables.
- New research suggests that restoring those phytonutrients will increase our odds of enjoying optimal health and even extend our healthy lifespan.

Road Map

Part I. What are "phytonutrients"?

Part II. What is now known about the health benefits of a phytonutrient-rich diet?

Part III. Compared with our original diet, our modern diet is very low in phytonutrients.

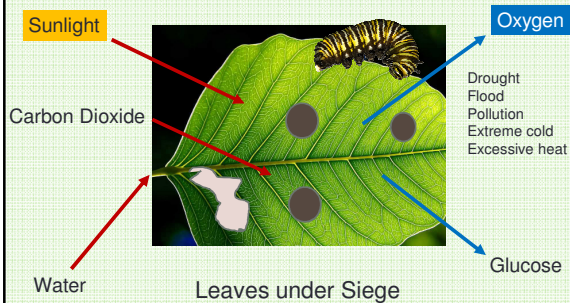
Part IV. What are simple and practical ways to enhance the phytonutrient content of our daily diet?

Part I: What are Phytonutrients?



- Compounds produced by plants for their own self-protection.
- Aka "phytochemicals," "bio-nutrients," and "polyphenols."
- More than 8000 identified to date.

Plants would not survive without phytonutrients.




Phytonutrients are manufactured as needed.

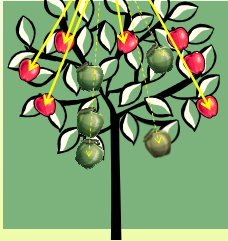


UV-protecting phytonutrients peak at high noon.






UV Light




Apples in direct sunlight produce more phytonutrients.

When we consume phytonutrients, the plant's self-protection becomes *our* protection.



LYCOPENE



LYCOPENE STUDY

- Active group: 3 T. tomato paste in olive oil
- Control group: olive oil
- 10 weeks: 40% reduction in sunburn in group consuming tomato paste.

J. Nutr. 131: 1449-1451, 2001.

Part II. What is now known about the health benefits of a phytonutrient-rich diet?

Decades ago, many dieticians were taught that most phytonutrients were **"anti-nutrients."**



Oxalic acid



Most phytonutrients are potent antioxidants.



- Only 24% of antioxidant activity of oranges comes from vitamin C.
- 76% comes from little known phytonutrients that act synergistically.

(carotenoids, isohesperidin, terpenol, naringin, limonin, flavonoids, hesperidin, limonene)

Phytonutrients can sooth **INFLAMMATION**: the root cause of many diseases.



JOINTS: Pain, immobility, costly surgery and rehab



ARTERIES: Heart Attack and Stroke



BRAIN: Migraine and Alzheimer's Disease



LIVER: Cirrhosis, fatty liver disease, cancer



GUT: Colitis, IBS, and Cancer
Am J Clin Nutr 2014; 99:463-71.

Some phytonutrients detoxify carcinogens.



Glucosinolates in cabbage family boost enzymes that detoxify carcinogens.

Consuming crucifers is linked with a lower risk of prostate cancer.



- Survey of 628 men from Washington State.
- Men who ate three or more servings of crucifers per week had 42% lower risk of prostate cancer than men who consumed one serving or less.

Journal of the National Cancer Institute
2000, 92 (1).

The phytonutrients (betalains) in red beets increase the elasticity of arteries:



Mo Farah

Helps runners shave 5 seconds off a five km race.



Allows older people to walk a set distance with 12% less effort.

J. Applied Physiology
2010, 110:591-600.

Drinking wild blueberry juice or Concord grape juice each day:

Enhanced memory and cognition in
people with Mild Cognitive Impairment—
with only positive side effects.



British Journal of Nutrition (2010),
103, 730-734

Drinking hibiscus tea lowers blood pressure.

- Randomized, placebo-controlled trial of people with mild-hypertension.
- 3 cups of hibiscus tea each day for 2 months.
- Tea drinkers had **7.2 mm** Hg reduction in SBP and **3 mm** reduction in DBP.
- Greater improvement than seen with the DASH diet (8-10 servings of produce per day)
- 5 mm reduction in SBP is linked with 14% overall reduction in deaths due to stroke, 9% reduction in deaths from CAD, and 7% reduction in all cause mortality.



The Journal of Nutrition, 2010,
140:298-303

Consuming flavanol-rich dark chocolate lowers blood pressure, cholesterol, and glucose levels.

- Some dark chocolate is rich in a family of phytonutrients called "flavanols."
- People with high blood pressure consumed dark or white chocolate candy for 15 days, then switched to the other confection.
- Dark chocolate, but not white chocolate, lowered their blood pressure, blood sugar, and total and LDL cholesterol.



Flavanol-rich dark chocolate can enhance our thinking ability.

- 30 healthy young adults
- 1 bar of dark or white (flavanol-free) chocolate.
- 2 hours later, tested for thinking ability.
- 2 weeks later, switched to other candy and retested.
- Eating dark chocolate increased their cognition and decision making speed, but not white chocolate.



Physiology and Behavior.
2011; 103:255-260

Extra-virgin olive oil, rich in phytonutrients, reduces CVD risk more than refined oil.



- 2006, randomized study comparing extra-virgin and refined olive oil.
- Extra-virgin resulted in greater rise in HDL cholesterol.
- Extra-virgin protected LDL cholesterol from oxidation.
- Oxidized LDL is the first step in the creation of arterial plaque.

Annals of Internal Medicine.
2006; 145:333-341

Combining *multiple* phytonutrient-rich foods yields greater heart benefits.

- 2014 randomized controlled study (Italy)
- 86 overweight/obese individuals
- Diets identical except for phytonutrient content
- Phytonutrient-rich foods: green tea, dark chocolate, blueberry jam, artichokes, onions, spinach, arugula, extra-virgin olive oil.
- Lowered triglycerides, total cholesterol, VLDL cholesterol, and oxidative stress.

Am J Clin Nutr. 2014; 9:463-7.

Dietary study with healthy, normal weight people produced similar results.

- 2008 randomized, cross-over study, with 33 healthy, normal weight individuals. (Italy)
- Each person spent two weeks on each diet.
- Phytonutrient-rich foods: red berries, black grapes, hot chocolate, extra-virgin olive oil, red wine, dark chocolate, and walnuts.
- Benefits of high phytonutrient diet: lower triglycerides, total cholesterol, VLDL cholesterol, and oxidative stress as well as less systemic inflammation and better liver function.

A phytonutrient-rich diet might even help you live longer.

- 807 men and women, 65 years and older. (2013)
- Researchers measured the phytonutrient content of the customary diet of each volunteer.
- Health of the volunteers monitored after 12 years.
- **30% FEWER DEATHS** in the group consuming the most phytonutrients compared with the group that consumed the least.

Journal of Nutrition 2013, 143: 1445-1450

Women who consumed the most phytonutrients had a **60 percent** reduction in mortality.

- May, 2015 edition of the *American Journal of Clinical Nutrition*
- 1063 Australian women over 75 years of age.
- Women with most phytonutrients (flavonoids) in their diet had a **60 percent lower risk of dying** in a five-year period than women who had the least.
- Also **64% fewer deaths from CVD**
- **73% fewer deaths from cancer**
- Best sources of flavonoids: Tea, chocolate, red wine, and fruit.

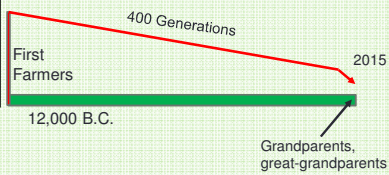
Am. J. Clin Nutr. 2015, 112:120.

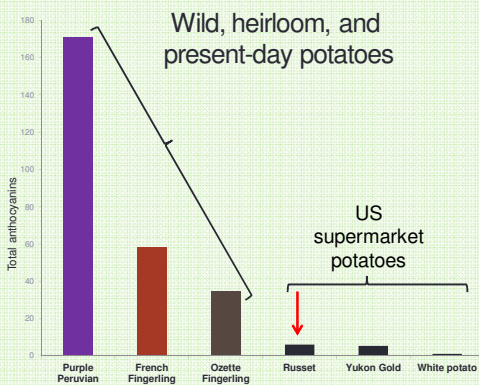
Part III. Compared with our original diet, our modern diet is very low in phytonutrients.

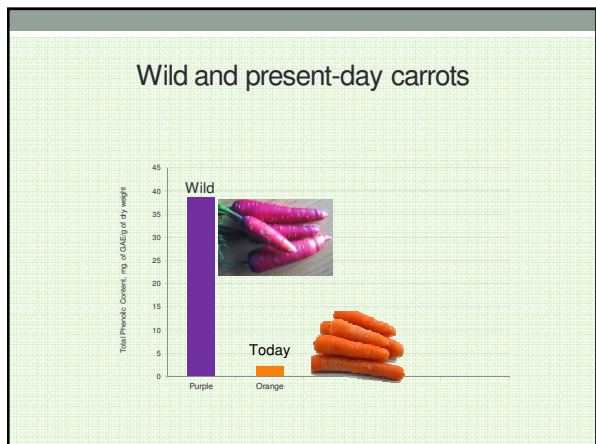
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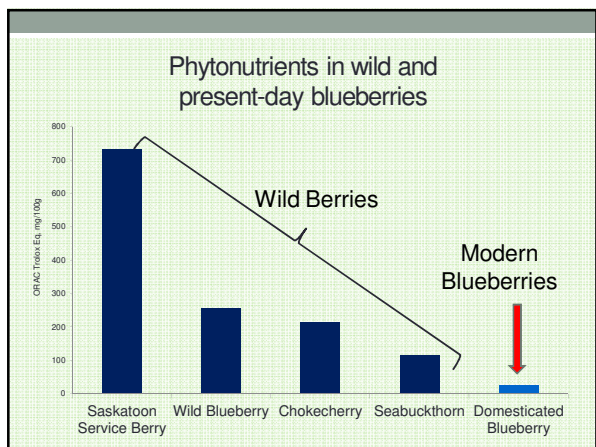


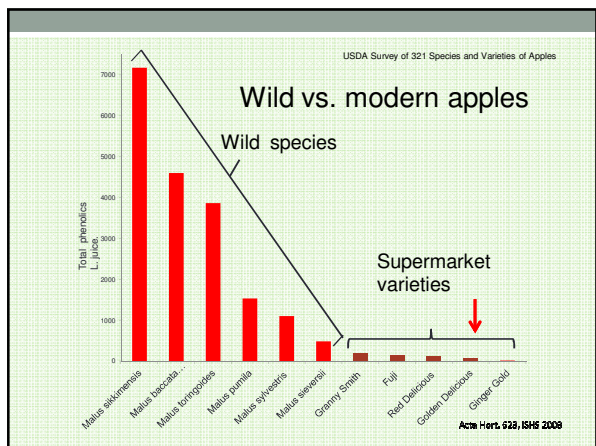
Wild plants are rich in phytonutrients.

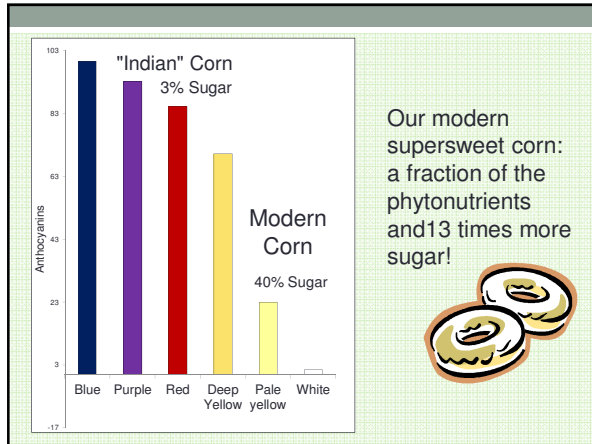













A Golden Delicious apple a day did *not* keep the doctor away.



Golden Delicious

- 2009 study of 46 overweight men with high risk of heart disease
- One group stayed on customary diet; one group added an apple a day.
- After 8 weeks, the apple eaters had an *increased* risk of heart attack and stroke.

International J. of Preventive Medicine. 2009. 2:94-100

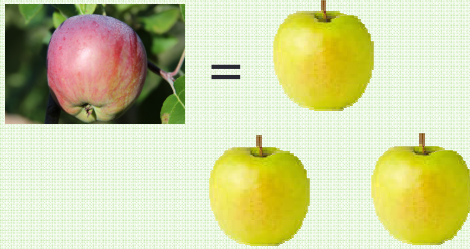
Part IV. How can we enhance our phytonutrient intake?

Choosing the most nutritious *varieties* of fruits and vegetables may be even more important than consuming more servings.

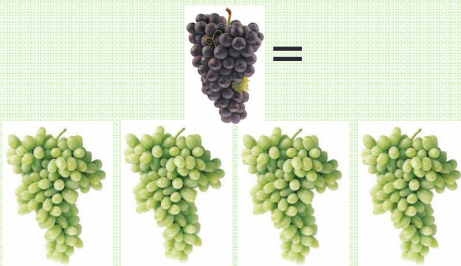
The reason that variety matters is that the phytonutrient content of individual varieties can vary from 2 to 400 fold.



1 'Liberty', 'Akane' or 'Granny Smith' apple gives you the same amount of phytonutrients as 3 'Golden Delicious' apples.

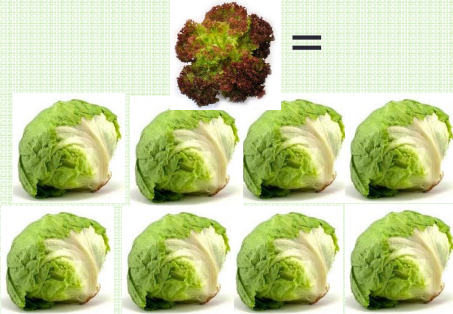


1 serving of black seedless grapes gives you as many phytonutrients as 4 servings of Thompson Seedless grapes.

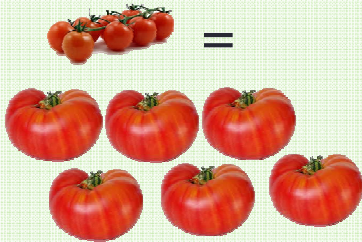


J. Agric. Food Chem. 1994. 42:64-69

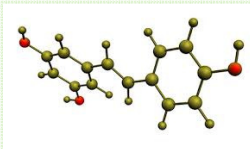
1 red leaf lettuce salad is equal to
8 Iceberg lettuce salads.



Ounce per ounce, cherry tomatoes have up to
18 times more "lycopene" than most beefsteaks.



You can also preserve and enhance
the phytonutrient content of all varieties.
(Fun with Phytochemicals)



Garlic: Press and then Rest



1. Allicin forms when garlic is wounded, bringing alliin in contact with alliinase.
2. Heat destroys alliinase, preventing the desired chemical reaction.
3. Solution: **Press**, then **Rest** garlic for 10 minutes *before* cooking to maximize allicin production.

J Agric. Food Chem. 2007. 55:1280-1288

Lettuce: Rip before you Refrigerate.



Get 3-4 times more antioxidant activity.

J. of Agric. and Food Chemistry
2002. 50:7536-7541

Choosing the *freshest* fruits and veggies can also enhance your phytonutrient intake.

- Plants do not die when harvested.
- They begin to consume oxygen and burn up their stored sugar and antioxidants: "Respire."
- Some plants respire very rapidly. Within days of harvest, they have lost their flavor and ability to protect your health.



They're alive!

EAT ME FIRST fruits and veggies.

1. Artichokes
2. Arugula
3. Asparagus
4. Broccoli
5. Brussel's Sprouts
6. Cherries
7. Kale
8. Lettuce
9. Spinach



Asparagus loses its flavor and health benefits very rapidly.



- **2 days after harvest:** Three-fourths of natural sugar has disappeared.
- **4 days after harvest:** Twice as bitter.
- **7 days after harvest:** Half the antioxidants are gone.
- Day by day, the stalks become tougher.

How to tell fresh asparagus? Examine the cut ends.



Broccoli loses most of its cancer-fighting and antioxidant activity in ten days.

- 2003 study from Spain
- 10 days after harvest, Broccoli still looked fresh and appetizing.
- 74% loss of phytonutrients
- 71-80% loss of cancer-fighting compounds



J. Agric. Food Chem. 2003, 51:3029-3034.

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