The China Study, and

What You Didn't Want To Know About Diet

Sunday, March 23, 2014
Evanston Friends Meeting
**Table of Contents**

Why this talk? ................................................................................................................................. 3
What is *The China Study*? ................................................................................................................ 4
What was the China Project? ............................................................................................................. 5
Who led the China Project? ............................................................................................................. 6
Who is T. Colin Campbell, Ph.D. .................................................................................................... 7
Why was the China Project done? .................................................................................................. 8
How was the China Project done? .................................................................................................. 10
Project results.................................................................................................................................. 11
The China Project's surprising results ............................................................................................... 12
Surprising results from supporting studies ...................................................................................... 13
Other myths busted .......................................................................................................................... 15
That word we hate: "Vegan" ............................................................................................................ 16
Is the China Project proof? .............................................................................................................. 17
What would it take to have proof? .................................................................................................... 18
The three stages of cancer ................................................................................................................. 19
In the absence of proof, what do we do? ......................................................................................... 20
"But where do I get my protein?" .................................................................................................... 22
Breast cancer ................................................................................................................................... 24
Heart disease ..................................................................................................................................... 25
Diabetes ............................................................................................................................................ 26
Osteoporosis .................................................................................................................................... 28
Other diseases and conditions .......................................................................................................... 29
Environmental reasons to consider a WFPB diet ............................................................................ 30
Criticism of *The China Study* ....................................................................................................... 32
Praise for *The China Study* ........................................................................................................... 33
Disadvantages of the WFPB diet ...................................................................................................... 34
Advantages of the WFPB diet .......................................................................................................... 35
Why was I open to believing something so radical? .... 36
Why this talk?

- I'm not a scientist, no degree in nutrition
- I thought I knew about nutrition. Massive amount of science has disproven what I thought I knew
- You're busy people, lots to read
- If it's correct, it could save your life
- May help you eat healthier, be healthier (HRM)
- Pertinent to current healthcare debate
- Pertinent to climate change
- Unexpected deaths of friends
- The book is helping Paul and me – more energy, Paul's asthma gone, my cholesterol under control
- Complex book on a complex topic – try to hit only main points that struck me
  Loaner copies of TCS and Fuhrman's book
  Printouts of articles and things from the book
What is The China Study?

- Book by T. Colin Campbell, Ph.D., and his son, Tom, an M.D., published 2004

- Discusses
  1. "the China Project" *(The China-Oxford-Cornell Study on Dietary, Lifestyle and Disease Mortality Characteristics in 65 Rural Chinese Counties)*
  2. hundreds of other studies

- 36 pages of notes citing studies
What was the China Project?

- Large **observational study** in rural China in 1980s

  Draws inferences about the possible effect of a treatment on subjects, where the assignment of subjects into a treated group versus a control group is outside the control of the investigator.

  **Different from experiments** where subjects are randomly assigned to a treated or group control.

- Jointly funded by Cornell, Oxford, Chinese Gov't
- The most comprehensive study of health and nutrition ever conducted
- "The Grand Prix of epidemiology" – *New York Times*
Who led the China Project?

**LEADER:** T. Colin Campbell, Prof. Nutritional Biochemistry, Cornell

**Junshi Chen,** Deputy Dir., Institute of Nutrition and Food Hygiene, Chinese Academy of Preventive Medicine

**Sir Richard Peto,** University of Oxford

**Li Junyao,** China Cancer Institute
Who is T. Colin Campbell?

- Grew up on a dairy farm
- M.S. Nutrition and Biochemistry, Cornell, 1957
- Ph.D. Nutrition, Biochem. & Microbiology, Cornell, 1962
- Research at MIT, isolated dioxin (Agent Orange)
- Ran lab at Virginia Tech
- 70+ grant-years of peer-reviewed research funding
- 300+ research papers
- Estimates 70% drop in America's medical costs if we all went on a plant-based diet
Why was the China Project done?

- 1980: Dr. Junshi Chen did research sabbatical in Campbell's lab
- Chen had shown effect of nutrients on rare heart condition in children
- During Chen's sabbatical, China released *Atlas of Cancer Mortality in the People's Republic of China*
- Chinese Premier Chou En Lai got cancer, not well understood
- Government of China sponsored largest survey of disease mortality ever undertaken
- Death rates from 48+ diseases
- 880 million people (96% of population)

(continued)
Impact of *Atlas* on Campbell and Chen

- *Atlas*: in China, cancer was *geographically localized*
- Cancer in the US *is not*

**Why the difference?**

- **US**: Differences would be *2-3 times*
- **China**: Cancer rates different by *more than 100 times*
  - Most Chinese same genetic group ("Han"), so difference *not genetic.*

- Idea to do a study of human nutrition and disease
- Invited Atlas's author, Dr. Li Junyao, to join
- Invited Sir Richard Peto, Oxford, to join
  - Peto and Sir Richard Doll, also of Oxford, reviewed 22 studies for US Congress which estimated *genetics only responsible for 2-3% of total cancer risk.*
How was the China Project done?

- 1983-84
- 100 people in each of 65 rural counties (total 6500)
- Ages 35 - 64, half male, half female
- Blood tests
- Urine tests
- Dietary questionnaires
- What families ate for 3 days was measured
- Foods in marketplaces analyzed for nutrient content
- 367 variables, each compared with every other
- China Project results correlated with *Atlas* from 1973-75
China Project published results

Published as monograph 1990 co-funded by the universities and governments involved

Available for purchase, expensive

Extremely technical

World's scientists began to study correlations
Why China was the perfect choice

- In rural China, most people didn't move around much
- Diet varied greatly from one village to another – some villages ate lots of animal products, others none at all

The China Project's surprising results

- Geographic localization was due to diet and lifestyle
- People who consume animal-based foods have more risk of disease while the opposite is true of those who consume more plant-based foods.
- Animal protein correlates with disease, not just animal fat
- When every disease rate was compared with every other disease rate, two groups of diseases emerged – assumption that each group shares common causes

<table>
<thead>
<tr>
<th>Diseases of Affluence (nutritional extravagance)</th>
<th>Cancer (colon, lung, breast, leukemia, childhood brain, stomach, liver), diabetes, coronary heart disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diseases of Poverty (nutritional inadequacy and poor sanitation)</td>
<td>Pneumonia, intestinal obstruction, peptic ulcer, digestive disease, pulmonary TB, parasitic disease, rheumatic heart disease, metabolic and endocrine disease other than diabetes, diseases of pregnancy, and many others</td>
</tr>
</tbody>
</table>
Surprising results from supporting studies

- China Project subjects ate **30% more calories** and **weighed 20% less** than average Americans, adjusted for activity of lifestyle. (TCS p.99) **Mechanism of action:** Eating only plant protein, the body releases extra calories as heat, doesn't store as fat. (Campbell, 1999, in Toxicological Sciences.)

- **Casein**, the protein in cow's milk, is a carcinogen. (See detailed description of studies in Chapter 3, TCS.)

- **Diet can turn cancer on and off.** Studies with rats fed a high-animal-protein diet that initiated tumors, which then disappeared when the rats were switched to a plant-based diet. The rats were switched back to animal protein, the tumors reappeared. The rats were switched back again to a WFPB diet and the tumors disappeared again.

- Eating a plant-based diet gives you **more energy**, not less. Studies with rats showed an increase in exercise wheel use on a plant-based diet.

- **Carroll study** shows higher animal fat intake associated with increased **breast cancer mortality**, and increase isn't associated with plant fat intake. (Charts in a minute.)

  (continued)
3 studies on bone fractures (putative osteoporosis) (Hegsted, Abelow et al, and Margen et al) show higher bone fracture rates with calcium from animal sources.

Cleveland Clinic study shows reversal of advanced heart disease among 18 seriously ill patients consuming a plant-based, low-fat diet.

1946 Morrison study, 100 heart attack survivors, odds of surviving 12 years were far higher on low-fat diet.

Studies in 1980s by physicians Diehl, Goldhamer, Klaper, McDougall, Ornish, and Shintani

Studies since TCS was published by physicians T. Barnard, N. Barnard, Corso, Fuhrman, Lederman, Montgomery, Popper, Pulde, Schulz, Shewman, and others
Other myths busted

- **Fiber** does more than keep you regular. It "pulls water from the body into the intestines to keep things moving along. These undigested fibers, like stick-um paper, also gather up nasty chemicals that find their way into our intestines and that might be carcinogenic. . . . [Constipation-based diseases] include large bowel cancer, diverticulitis, hemorrhoids and varicose veins." – info from Prof. Denis Burkitt, Trinity College, Dublin, winner of Bower Award (TCS p. 89)

- **Olive oil** isn't "good for you." It's fat, no significant nutrients.

- The so-called "**Mediterranean diet**" isn't good for you (high in fat, low concentration of nutrients). Based on peasants doing hard physical labor, early 20th Century.

- Some **overweight** people are actually **malnourished**. Eating empty calories, craving nutrients.
That word we hate: "Vegan"

- "Vegan" has bad connotations
- I thought "vegan" was
  - response to animal rights (not always!)
  - unscientific and extreme (not true!)
  - bad-tasting or bland food (not the way I cook!)

- Technically "vegan" is a reaction – No animal products
- "Vegan" says nothing about what you're going toward = Health through nutrients
- "Whole Foods Plant-Based" diet = the goal

"Whole Foods Plant-Based Diet"
(WFPB – "wofe-pub"?)
Does the China Project offer **proof** that eating animal protein causes disease? **NO!**

- **In human nutrition studies, proof isn't possible.**
- **Why not?** Human nutrition has too many variables.

<table>
<thead>
<tr>
<th><strong>A FEW (SIMPLIFIED) NUTRITION FACTS</strong></th>
<th><strong>Category</strong></th>
<th><strong>Examples</strong></th>
<th><strong>How necessary</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&quot;Macronutrients&quot;</strong></td>
<td><strong>Examples</strong></td>
<td><strong>How necessary</strong></td>
<td></td>
</tr>
<tr>
<td>&quot;Macro&quot; because we need a lot of them</td>
<td>Protein</td>
<td>Essential for life</td>
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<td>Carbohydrates</td>
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<td>Fat</td>
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<td>Water</td>
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<tr>
<td><strong>&quot;Micronutrients&quot;</strong></td>
<td><strong>Examples</strong></td>
<td><strong>How necessary</strong></td>
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<tr>
<td>&quot;Micro&quot; because amounts needed are tiny by comparison</td>
<td>Vitamins</td>
<td>Essential to avoid disease (Example: Vitamin C, scurvy)</td>
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<tr>
<td></td>
<td>Minerals</td>
<td>Essential to avoid disease (Example: Iron, anemia)</td>
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<tr>
<td><strong>Phytonutrients</strong></td>
<td></td>
<td>Optional. Prevent or reverse disease (more in a minute)</td>
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<tr>
<td>(phyto = plant) (10,000 so far)</td>
<td><strong>Examples</strong></td>
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<tr>
<td></td>
<td>Carotenoids</td>
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<td>Chlorophyll &amp; Chlorophyllin</td>
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<td>Curcumin</td>
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<td></td>
<td>Fiber</td>
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<td>Flavonoids</td>
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<td></td>
<td>Garlic</td>
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<td>Indole-3-Carbinol</td>
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<td>Isothiocyanates</td>
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<td>Lignans</td>
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<td>(phytoestrogens)</td>
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<td></td>
<td>Phytosterols</td>
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<td>Resveratrol</td>
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<td></td>
<td>Soy Isoflavones</td>
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<tr>
<td></td>
<td>(phytoestrogens)</td>
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</table>
What would it take to have proof?

Knowing:

- exactly how many/how much of 10,000+ nutrients we had consumed
- how each nutrient interacts with each of the others
- an unknown number of genetic factors
- an unknown number of other environmental factors (air purity, water purity, etc.)
One Reason Phytonutrients Are Important: They Can Sometimes Reverse Cancer

- **Three Stages of Cancer:**
  - *Initiation, Promotion, Progression*
  - Metaphor: growth of a lawn

<table>
<thead>
<tr>
<th>Stage</th>
<th>How it happens</th>
<th>Who and when</th>
</tr>
</thead>
</table>
| **Initiation**
Seeding the soil for a lawn | Exposed to carcinogens, which genetically transform normal cells into cancer-prone cells, damaging DNA. Affected by protein intake. *(TCS p.51ff)* | Probably everyone
Can be quick
Usually irreversible |
| **Promotion**
Grass grows | Foci grow into tumors. "Foci development was almost entirely dependent on how much protein was consumed…" | **Reversible** depending on conditions *(TCS p.50)* |
| **Progression**
Grass takes over sidewalk, driveway ("Metastatis") | "Advanced cancer cells progress in their growth until they have done their final damage." *(TCS p.50)* | Irreversible |
In the absence of proof, what do we do?

1. **We use correlations**
2. **We look for mechanism of action**
3. **We do metanalysis**

1. **We use correlations.**

**Example #1:** We don't smoke, without proof that smoking will kill us
- Correlation between smoking cigarettes and disease (heart disease, stroke, lung cancer, emphysema, etc.)
- If you smoke cigarettes, odds of dying of a related disease are **one-third**
- This isn't proof that if you smoke, you will die

**Example #2:** We wear seat belts, without proof they will save our lives
- Correlation between wearing seat belts and surviving a crash
- If you wear a seat belt, your odds are **50% better** of surviving a crash
- This isn't proof that if you wear a seat belt, you will survive

The China Project produced over **8,000** statistically significant correlations. (Less than 5% probability that it's due to chance.) (*TCS p.40*)
2. **We look for mechanism of action.**
Two things are correlated in a significant way when there is a **mechanism of action** (the process by which something works in the body) that can explain the correlation.

**Example A:**
There are more telephone poles in the US than there are in Uganda.
There is also more heart disease.
*Are telephone poles and heart disease correlated?*
**No,** because no research has shown that telephone poles affect heart disease – no mechanism of action.

**Example B:**
More people who smoke cigarettes die of lung cancer than in the general population.
*Are smoking and lung cancer correlated?*
**Yes,** because research has shown that smoking changes cells in the body so that cancer is initiated – there is a mechanism of action to explain it.

3. **We use metanalysis.**
We look at additional studies that come to similar conclusions, which **add weight** to the correlations.
"But where do I get my protein?"

"Nothing has been so well hidden as the untold story of protein."

(TCS p.27)

A FEW FACTS ABOUT PROTEIN

- Hundreds of thousands of kinds of protein
- "The human body can derive all the essential amino acids from the natural variety of plant proteins that we encounter every day." (TCS p.31)
- Amount needed: **48 – 56 grams/day** at a healthy weight
- If 2000 calories/day = **11%** of calories from protein
- Average American gets **17%** of calories from protein
- **Why?** Belief in importance of "high quality" protein, probably enforced by food industries
- So-called "high-quality" protein from animals contains **fat and cholesterol**, which correlate with diseases of affluence
- Olympic gold-medalist Carl Lewis: "My best performances were when I was 30 years old and I was a vegan / vegetarian."
How can animal protein cause disease?
(Recommended reading: "The Mystique of Protein" at NutritionStudies.org, Dr. Campbell's website)

Mechanism of action:

- **Protein from animals = increased body growth rate =**
  - cancer cells grow faster
  - aging speeds up
  - girls mature younger, more estrogen, eventually elevated risk of breast cancer
Some study results I found shocking

1. Breast Cancer

Mortality rate: 5 times higher in the US than in China

See TCS for all 3 charts related to this study

Correlation between breast cancer and animal fat

Source: "Fat and Cancer," study by Prof. Ken Carroll (Univ. of Western Ontario), Braden, Bell et al, published in Cancer 58 (1986): 1818-1825.
2. Heart Disease
Mortality rate: **17 times higher** in the US than in China

- Correlation circa 1955 between animal **protein** and death from heart disease among men age 55-59 in 20 countries

**CHART 5.3: HEART DISEASE DEATH RATES FOR MEN AGED 55 TO 59 YEARS AND ANIMAL PROTEIN CONSUMPTION ACROSS 20 COUNTRIES**

3. Diabetes, Type 1

Type 1 diabetes is **36 times more common** in Finland (where they drink lots of cow's milk) than in Japan (where they drink almost none).

- Correlation circa 1990 between cow's milk consumption by children age 0-14 and type 1 diabetes

**CHART 9.3: ASSOCIATION OF COW’S MILK CONSUMPTION AND INCIDENCE OF TYPE 1 DIABETES IN DIFFERENT COUNTRIES**

Diabetes, Type 2

- See chapter 7 of *TCS* for detailed descriptions of numerous studies

- **Example**: Anderson study, 1986
  - 50 hospital patients, none overweight, injecting insulin
  - 25 with Type 1
  - 25 with Type 2
  - After 3 weeks on a high-fiber, high-carbohydrate, low-fat diet, Type 1s able to lower their insulin medication average 40%
  - 96% of Type 2s able to discontinue insulin
4. Bone Fractures (Osteoporosis)

- Correlation between animal protein and more bone fractures (putative osteoporosis). **Mechanism of action:** Calcium from animals acidifies the body, it takes calcium from bones as alkaline remedy. Calcium from plant sources doesn't acidify the body.

Other diseases and conditions that studies indicate may benefit from a WFPB diet

See TCS for more information.

- Alzheimer's
- Arthritis
- Asthma
- Colon cancer
- Colorectal cancer
- Dementia
- Kidney stones
- Lupus
- Macular degeneration
- Multiple sclerosis  (see correlation with Vitamin D)
- Obesity
- Parkinson's
- Prostate cancer
- Rheumatoid arthritis
- Stroke
Environmental reasons for a WFPB diet

- **Greenhouse gases.** Animals raised for food produce more methane than all the world's cars
  - Al Gore became a vegan last fall, maybe this reason?
  - "Livestock and their byproducts actually account for 51% of annual worldwide greenhouse gas emissions."

- Gore: "The impact of skyrocketing meat consumption on topsoil, deforestation, and freshwater resources – and its production of global warming pollution and cardiovascular disease – is magnified by another factor as well: nine kilograms of plant protein are consumed in the production of one kilogram of meat protein."

- **More energy used.** Animal products need more refrigeration than plant-based foods.

- "In the western US, cattle have the single most pervasive impact on public lands, depleting native biodiversity, increasing invasive exotics, diverting water, fouling streams, and baring the soil." (Source: Mary O'Brien, Utah Forests Program for the Grand Canyon Trust)
  (continued)
Environmental reasons, cont'd

- **Deforestation.** Tropical forests replaced with fields of GMO corn and soy laced with pesticides to feed factory-farmed beef.

- **Cruelty.** Chickens, pigs, cows, turkeys, mistreated.

- **Mercury.** Fish now commonly contain mercury.

- **Ocean food chain.** Fish becoming depleted in oceans, undermining the ocean food chain

  - Jonathan Gold: "People need to **stop eating blue fin tuna.** Period. … The numbers of these magnificent fish are dropping fast. If we don't stop eating them now, we'll stop in a few years anyway because there won't be any more." Blue fin tuna stock is down by more than 96% from unfished levels.
Critics of *The China Study*

- Frank B. Hu and Walter Willett, authors of a paper based on data from the **Nurses Health Study**

  *Campbell: "The Nurses' Health Study suffers from flaws that seriously doom its results. It is the premier example of how reductionism in science can create massive amounts of confusion and misinformation .... Hardly any study has done more damage to the nutritional landscape than the Nurses' Health Study ..." (TCS p.272)*

- Loren Cordain, Prof., Dept. of Health and Exercise Science, Colorado State Univ.: Campbell's thesis was "untenable and inconsistent with the evolution of our own species."

  *Campbell: "Diet-disease associations observed in contemporary times are far more meaningful than what might have occurred during evolutionary times..."*

- Dr. Eades - "Doesn't prove causation." His website sells protein supplements to vegetarians.

- Dr. Mercola – "My triglycerides rose." He doesn't describe the vegetarian diet he was on. His website sells organic beef, eggs and other animal products.

Praise for *The China Study*

- "Any serious challenge to the 'American Diet' is bound to elicit some academic, public, and food industry opposition ... the surprising data are difficult to interpret in any other way." – Wilfred Niels Arnold, Prof. Biochemistry, Univ. of Kansas Medical Center, in a book review in *Leonardo*

- "Our studies show that simple changes in diet and lifestyle can have a powerful effect not only in preventing disease but can reverse even severe coronary disease. ... we can have a hard time believing that simple changes we make in our lives each day can have the powerful effect that they do." – Dr. Dean Ornish, Preventive Medicine Research Institute, Prof. of Medicine, Univ. of California

- "Plaque does not develop until the endothelium, or the lining of the arteries, is injured -- and it is injured every time people eat meat, dairy, fish, and chicken. ... Cardiovascular disease is a toothless paper tiger that need never exist. And if it does exist, it need never progress. It is a food-borne illness. Change your food, and you change your life." – Dr. Caldwell B. Esselstyn, Jr., surgeon and former Olympic rowing champion

- "I have found my patients requiring less medication, reversing some of their complications, and even curing their diabetes. The effects also carried over to better control of hypertension and high cholesterol." – Dr. Donald Forrester, more than 30 years with Kaiser Permanente
Disadvantages of the WFPB diet

- More frequent grocery shopping – salad makings don't freeze well
- More time spent preparing food – fresh food usually takes more time to prepare than "fast" or canned foods
- More "tooting" but less odor
- More pooping (less time for reading in the bathroom!)
- More toilet paper used
- Harder to find a restaurant where you can stay on the diet
- Transition is an adjustment, depending on what you were eating
- Finding different "comfort foods"
- Friends thinking they need to talk you out of it
Advantages of the WFPB diet

- More energy, "lighter," "spring in your step"
- Easier to exercise – you feel more like exercising
- Eating more food – lower calorie density
- Fewer cravings because you're full from fiber
- Worrying less / more peace of mind about:
  - Cholesterol
  - Constipation
  - Varicose veins
  - Calories
  - Safety of food left out on the counter
- Fewer greenhouse gases produced on your behalf
- Animals and fish aren't driven to extinction on your behalf
- Your taste buds wake up
Why was I open to believing something so radically different?

In at least 4 ways in my life I'm already open to radically different thinking.

<table>
<thead>
<tr>
<th><strong>Mainstream thinking</strong></th>
<th><strong>Radically different thinking</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Good guys should kill bad guys</td>
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<tr>
<td>Violence now = less violence later</td>
<td></td>
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<tr>
<td>There are no bad guys, everyone has Divine Light</td>
<td></td>
</tr>
<tr>
<td>Violence now = more violence later</td>
<td></td>
</tr>
<tr>
<td>&quot;American dream&quot; = more is better The more you have, the happier you are</td>
<td></td>
</tr>
<tr>
<td>More doesn't make you happier, it can make you miserable. Live simply so that others may simply live</td>
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<tr>
<td>People are able to control their behavior. If they don't control it, they should be punished.</td>
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<tr>
<td>When we act out of shadow, we're not in control of our behavior. Punishment is less effective than helping.</td>
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<tr>
<td>Life is hard because life is random</td>
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<tr>
<td>Life is hard because the Divine sends us lessons to learn, and growth is hard</td>
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</tbody>
</table>
EAT ALL YOU WANT (WHILE GETTING LOTS OF VARIETY) OF ANY WHOLE, UNREFINED PLANT-BASED FOOD

<table>
<thead>
<tr>
<th>General Category</th>
<th>Specific Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits</td>
<td>orange, okra, kiwi, red pepper, apple, cucumber, tomato, avocado, zucchini, blueberries, strawberries, green pepper, raspberries, butternut squash, pumpkin, blackberries, mangoes, eggplant, pear, watermelon, cranberries, acorn squash, papaya, grapefruit, peach</td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
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<tr>
<td>Flowers</td>
<td>broccoli, cauliflower (not many of the huge variety of edible flowers are commonly eaten)</td>
</tr>
<tr>
<td>Stems and Leaves</td>
<td>spinach, artichokes, kale, lettuce (all varieties), cabbage, Swiss chard, collard greens, celery, asparagus, mustard greens, brussels sprouts, turnip greens, beet greens, bok choy, arugula, Belgian endive, basil, cilantro, parsley, rhubarb, seaweed</td>
</tr>
<tr>
<td>Roots</td>
<td>potatoes (all varieties), beets, carrots, turnips, onions, garlic, ginger, leeks, radish, rutabaga</td>
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<tr>
<td>Legumes (seed-bearing nitrogen-fixing plants)</td>
<td>green beans, soybeans, peas, peanuts, adzuki beans, black beans, black-eye peas, cannellini beans, garbanzo beans, kidney beans, lentils, pinto beans, white beans</td>
</tr>
<tr>
<td>Mushrooms</td>
<td>white button, baby bella, cremini, Portobello, shiitake, oyster</td>
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<tr>
<td>Nuts</td>
<td>walnuts, almonds, macadamia, pecans, cashew, hazelnut, pistachio</td>
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<tr>
<td>Whole grains (in breads, pastas, etc)</td>
<td>wheat, rice, corn, millet, sorghum, rye, oats, barley, teff, buckwheat, amaranth, quinoa, kamut, spelt</td>
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<tr>
<td>Minimize</td>
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<tr>
<td>Refined carbohydrates</td>
<td>pastas (except whole grain varieties), white bread, crackers, sugars and most cakes and pastries</td>
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<tr>
<td>Added vegetable oils</td>
<td>corn oil, peanut oil, olive oil</td>
</tr>
<tr>
<td>Fish</td>
<td>salmon, tuna, cod</td>
</tr>
<tr>
<td>Avoid</td>
<td></td>
</tr>
<tr>
<td>Meat</td>
<td>steak, hamburger, lard</td>
</tr>
<tr>
<td>Poultry</td>
<td>chicken, turkey</td>
</tr>
<tr>
<td>Dairy</td>
<td>cheese, milk, yogurt</td>
</tr>
<tr>
<td>Eggs</td>
<td>eggs &amp; products with a high egg content (i.e. mayonnaise)</td>
</tr>
</tbody>
</table>