

# Living Green: My opinion as a Biomedical Engineer

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To me, living green means leaving a soft footprint on the planet while enjoying a healthy life style.

Transportation: walk, bike, bus, use a hybrid car when necessary.

Housing: turn down the thermostat and wear a sweater.

Disease prevention: reduce the need for medical interventions and cost.

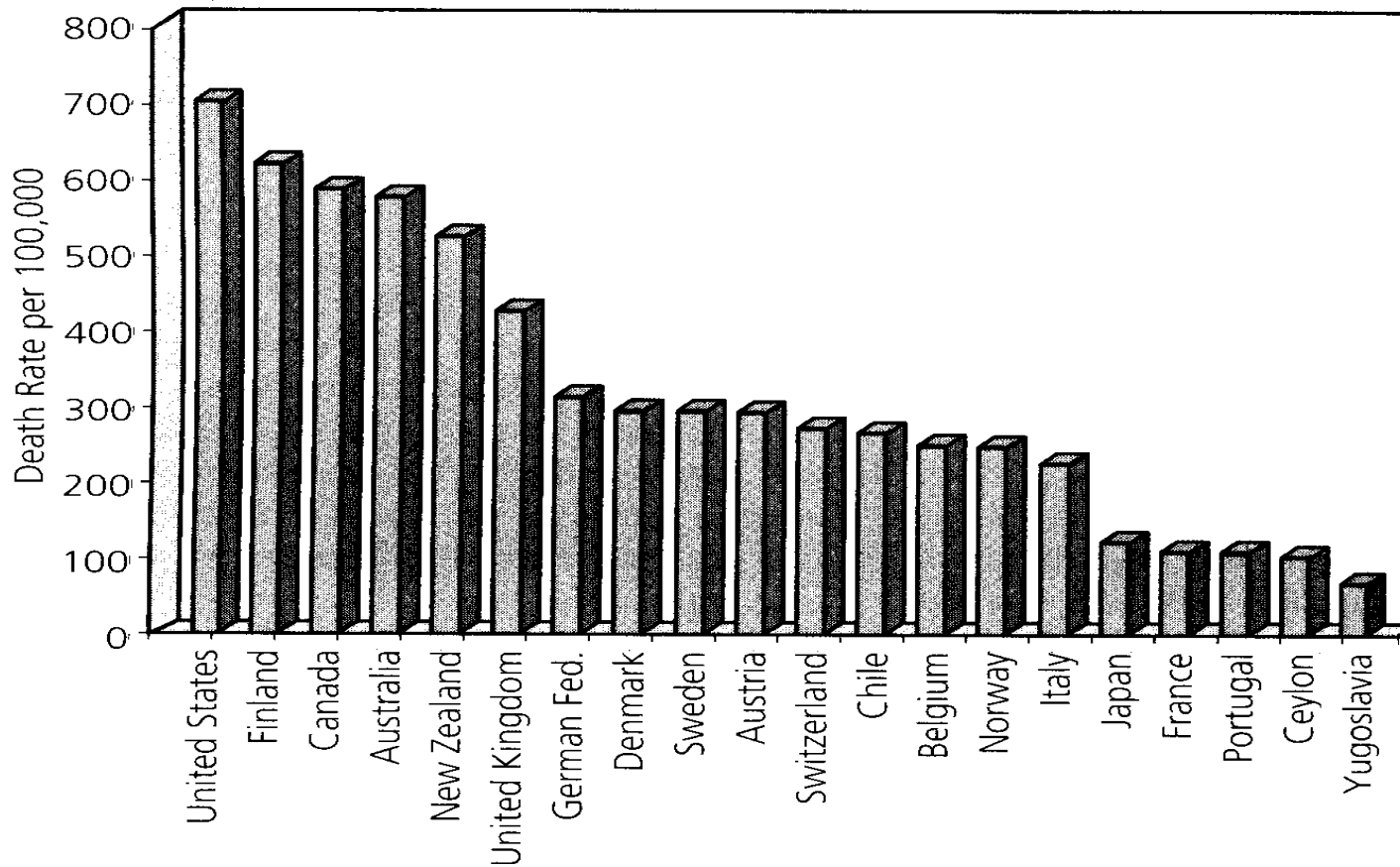
Diet: eat low on the food chain, (it takes 10 pounds of grain to make 1 pound of beef).



Plan ahead: after age 30,  
the average American  
gains 0.5 kg per year

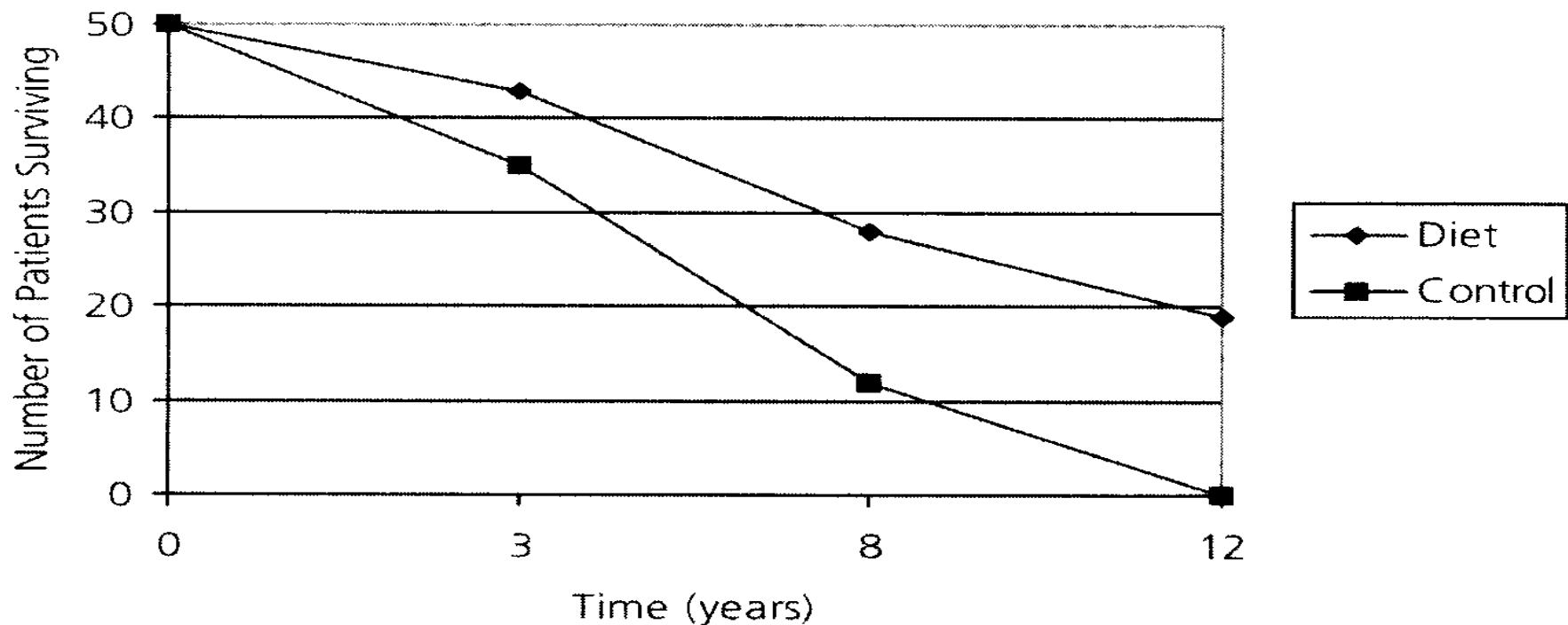
Most industrialized countries have high heart disease death rates.

**CHART 5.1: HEART DISEASE DEATH RATES FOR MEN AGED 55 TO 59 ACROSS 20 COUNTRIES, CIRCA 1955<sup>16</sup>**



After 12 years, 19 of 50 heart attack survivors were still alive by eating a diet low in fat and cholesterol. But 0 of 50 heart attack survivors, eating the normal American diet, were alive

**CHART 5.2: SURVIVAL RATE OF DR. MORRISON'S PATIENTS**



8 years before adopting a plant-based diet, the same 18 patients had 49 coronary events and an average cholesterol of 246 mg/dl. In the following 11 years, these 18 patients had 1 coronary event and an average cholesterol of 132 mg/dl. The parentheses ( in the photos of one patient show blockage in A, which opened up in B.

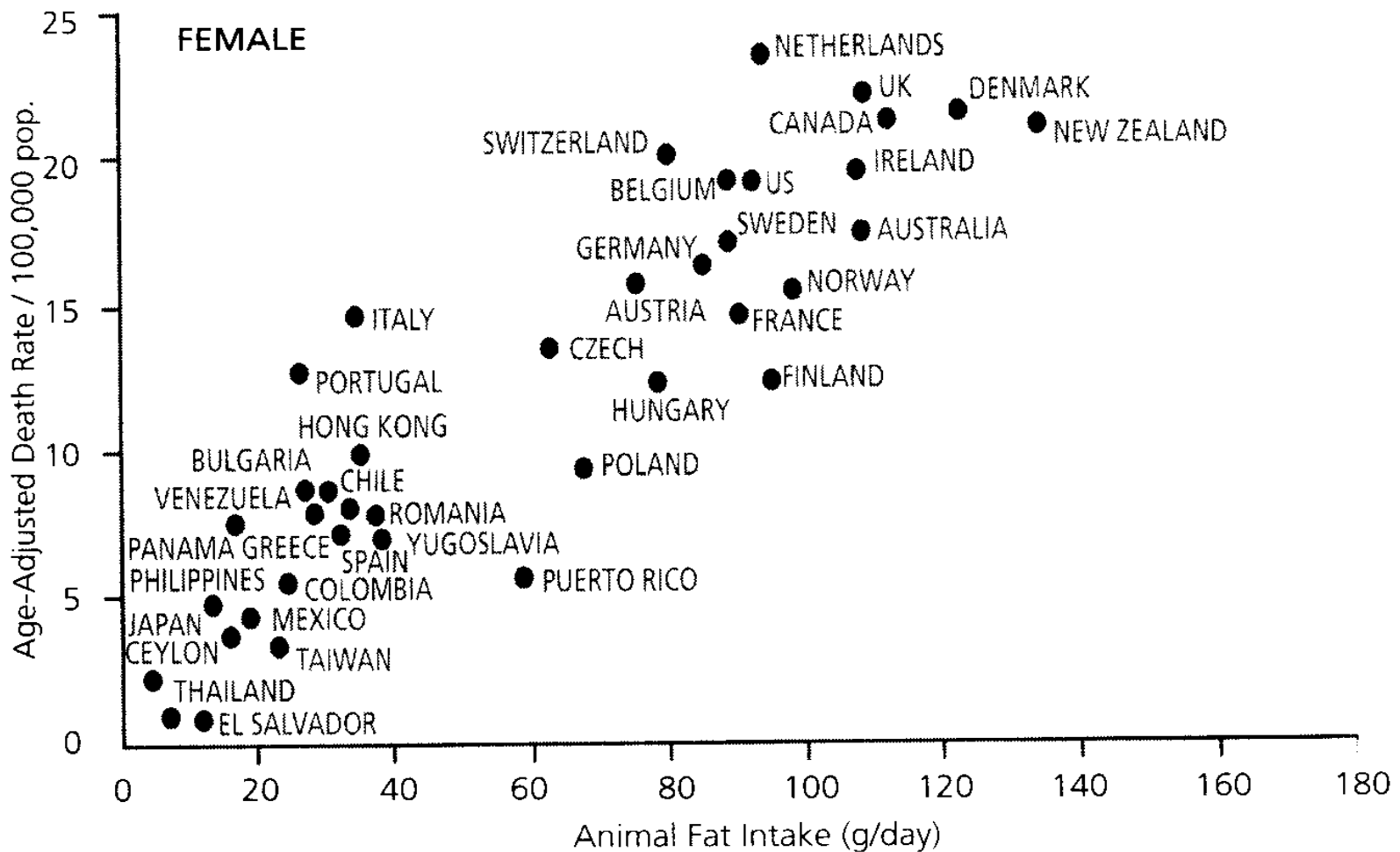
T. C. Campbell and T. M. Campbell II, *The China study*, Dallas, TX: Benbella Books, 2006. <http://www.thechinastudy.com/>

CHART 5.4: CORONARY ARTERY BEFORE AND AFTER CONSUMING PLANT-BASED DIET



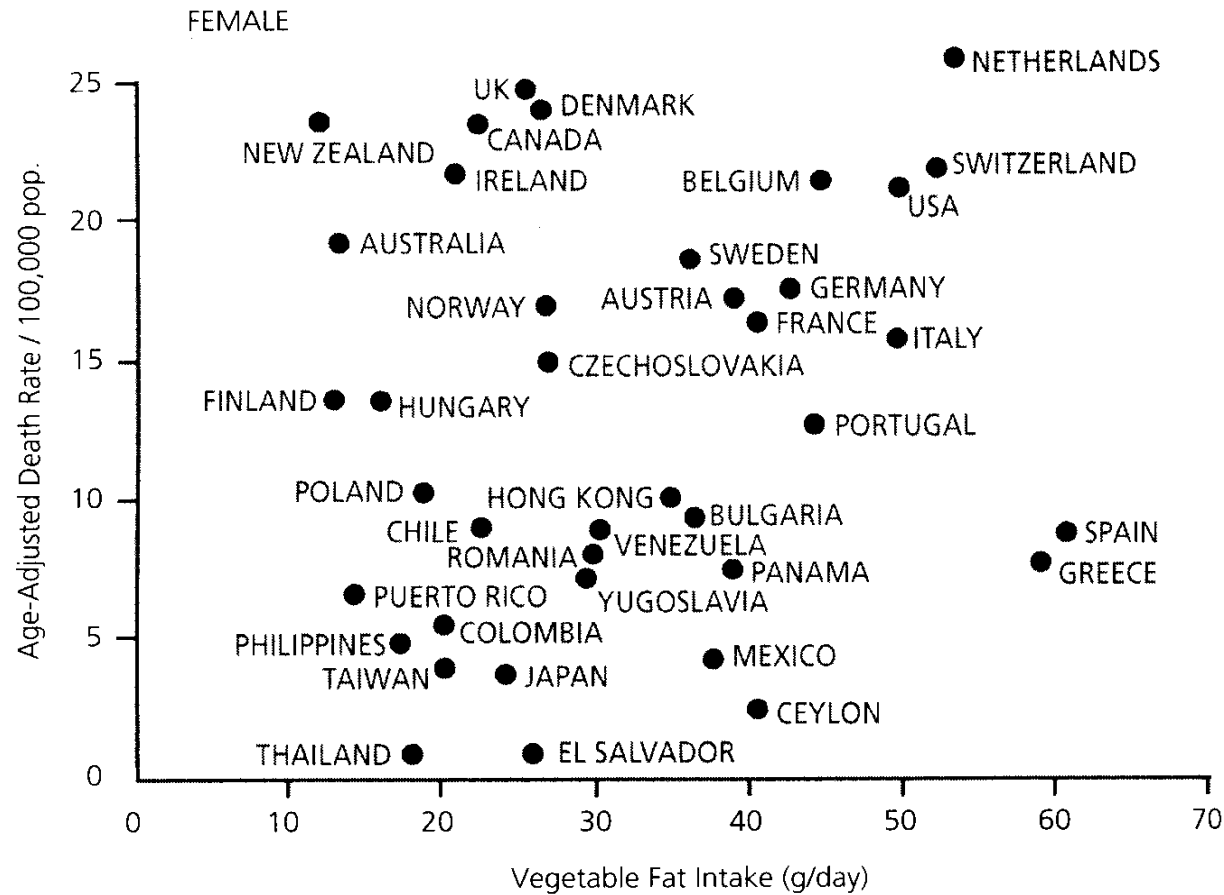
Increased daily *animal* fat intake correlates with death rate.

**CHART 4.8: ANIMAL FAT INTAKE AND BREAST CANCER**



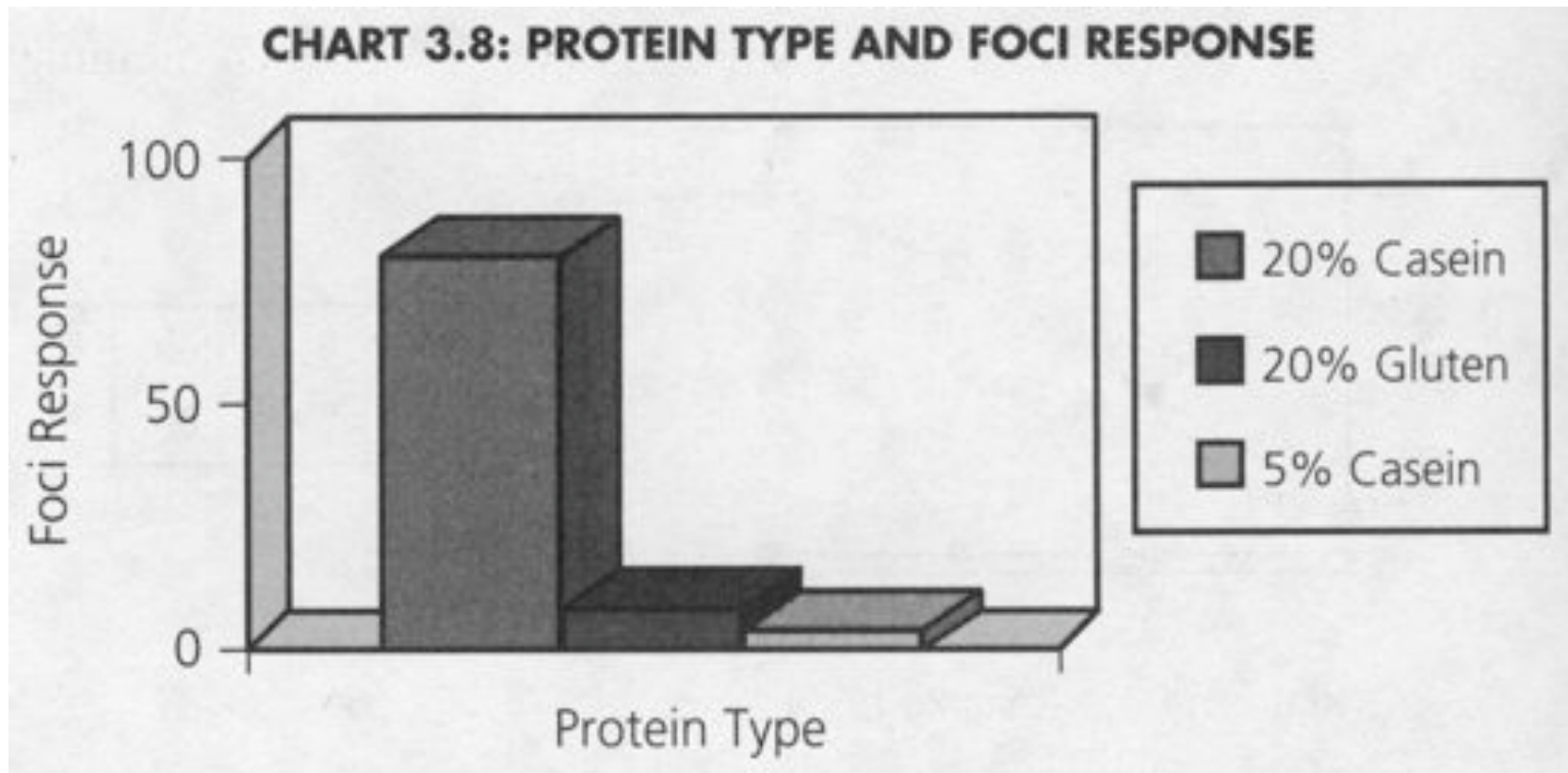
Increased daily *vegetable* fat intake does not correlate with increased death rate.

**CHART 4.9: PLANT FAT INTAKE AND BREAST CANCER**



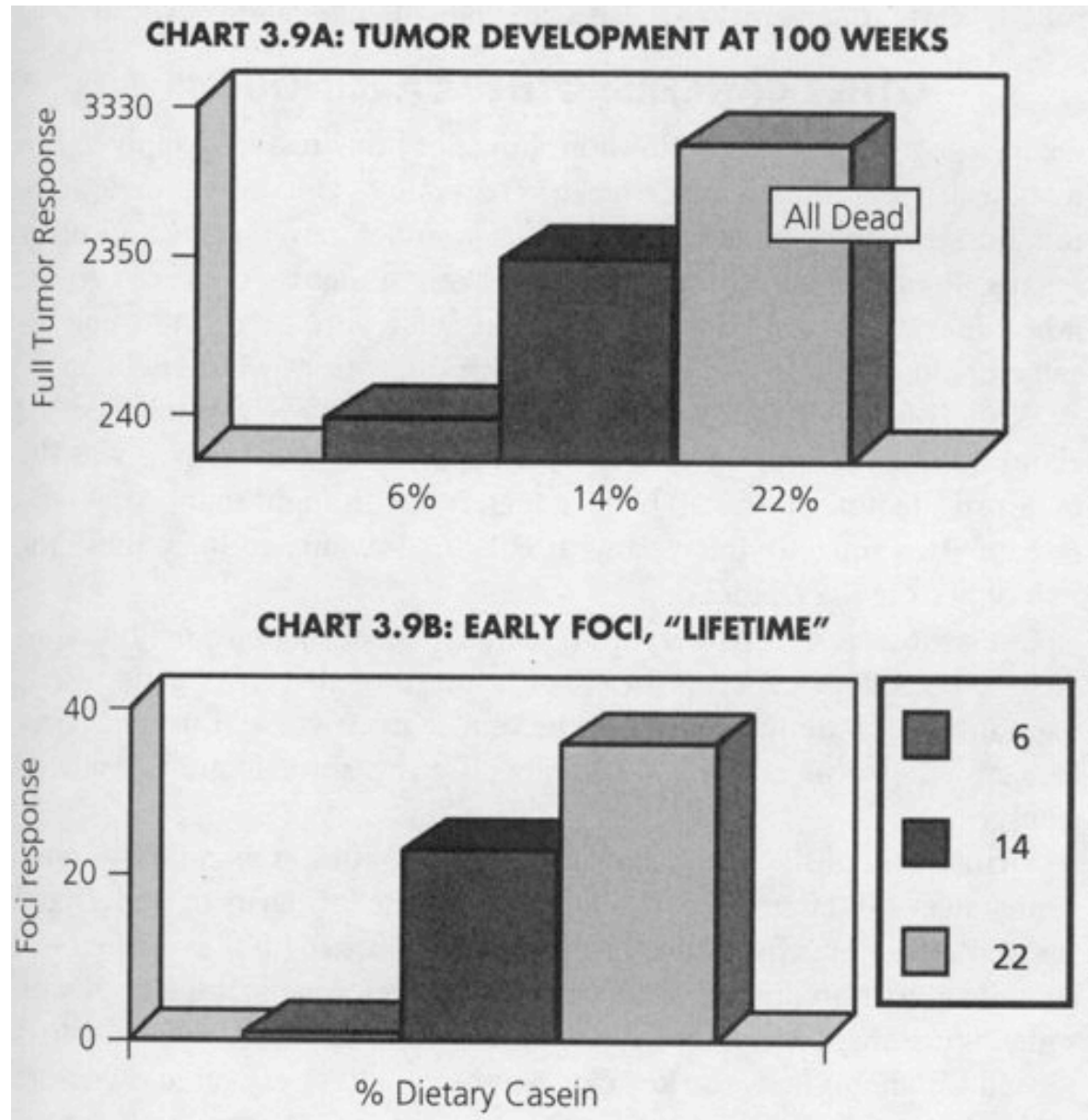


Rats fed carcinogens developed tumors. Tumor growth increased when fed 20% casein (milk protein). But tumor growth did NOT increase with feed containing 20% gluten (vegetable protein) or 5% casein.



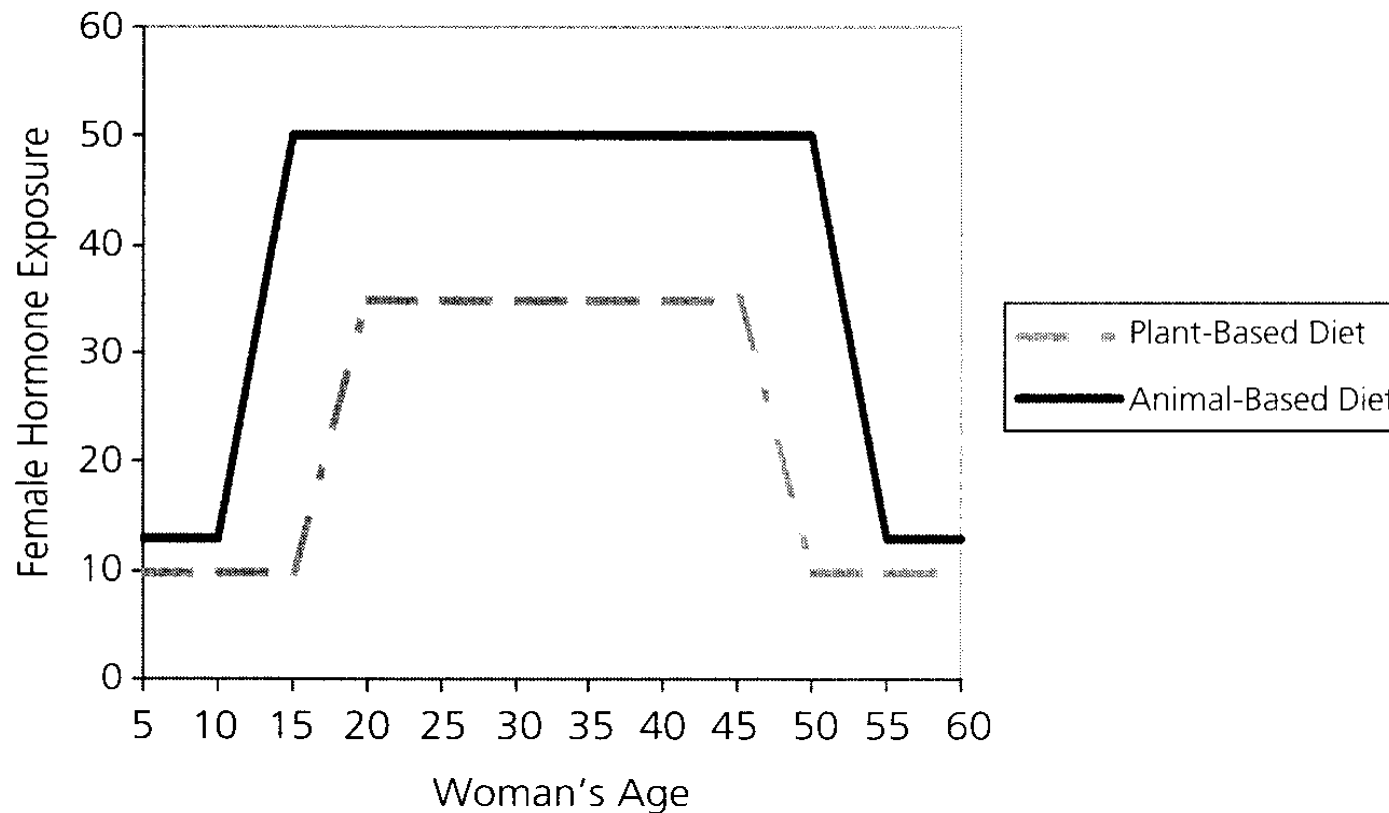
Top: For rats fed carcinogens and then casein at 22%, all were dead at 100 weeks.

Bottom: For rats fed carcinogens, tumors grew with increases in % dietary casein.



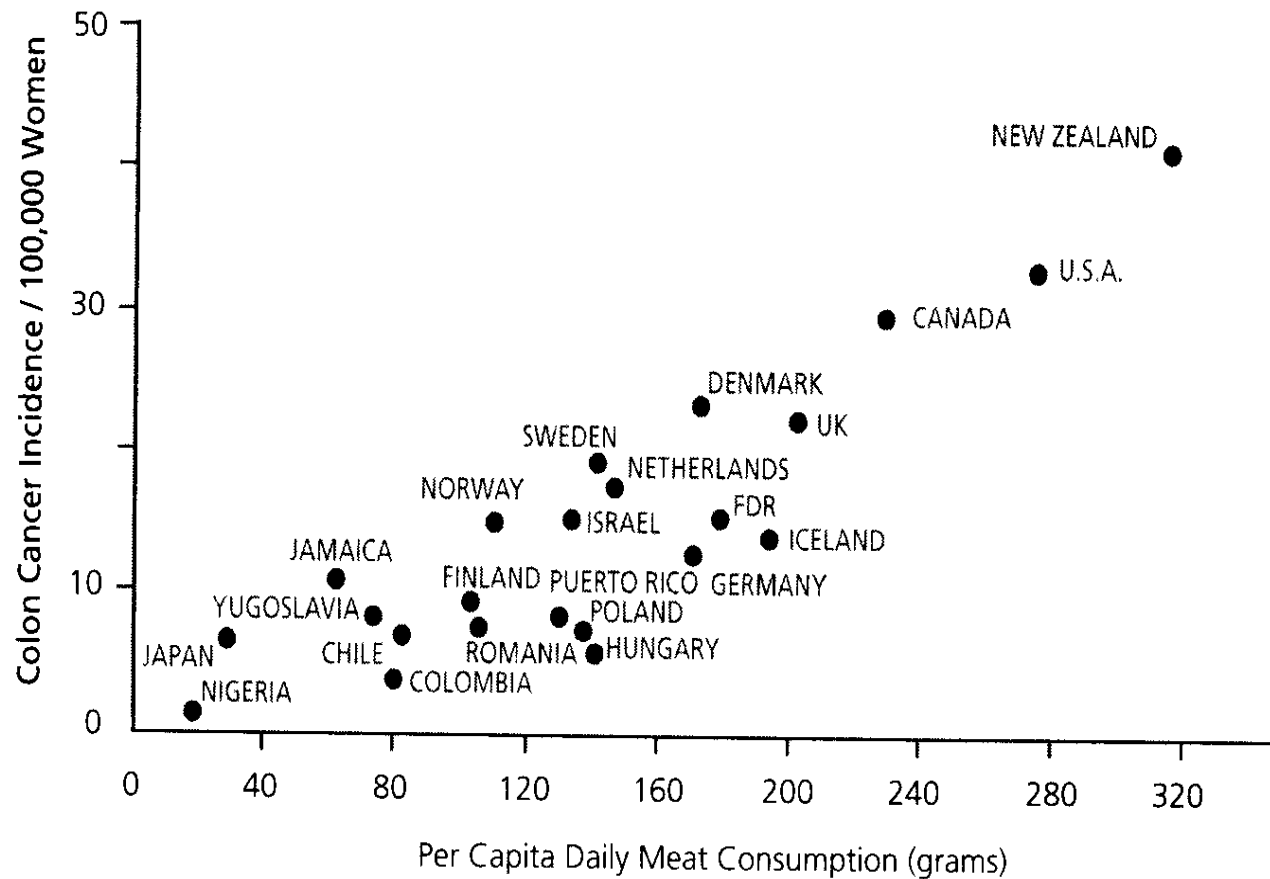
A plant-based diet correlates with later menarche, earlier menopause, lower hormone levels over lifetime and lower rates of breast cancer.

**CHART 8.2: DIETARY INFLUENCE ON FEMALE HORMONE EXPOSURE OVER A WOMAN'S LIFETIME (SCHEMATIC)**



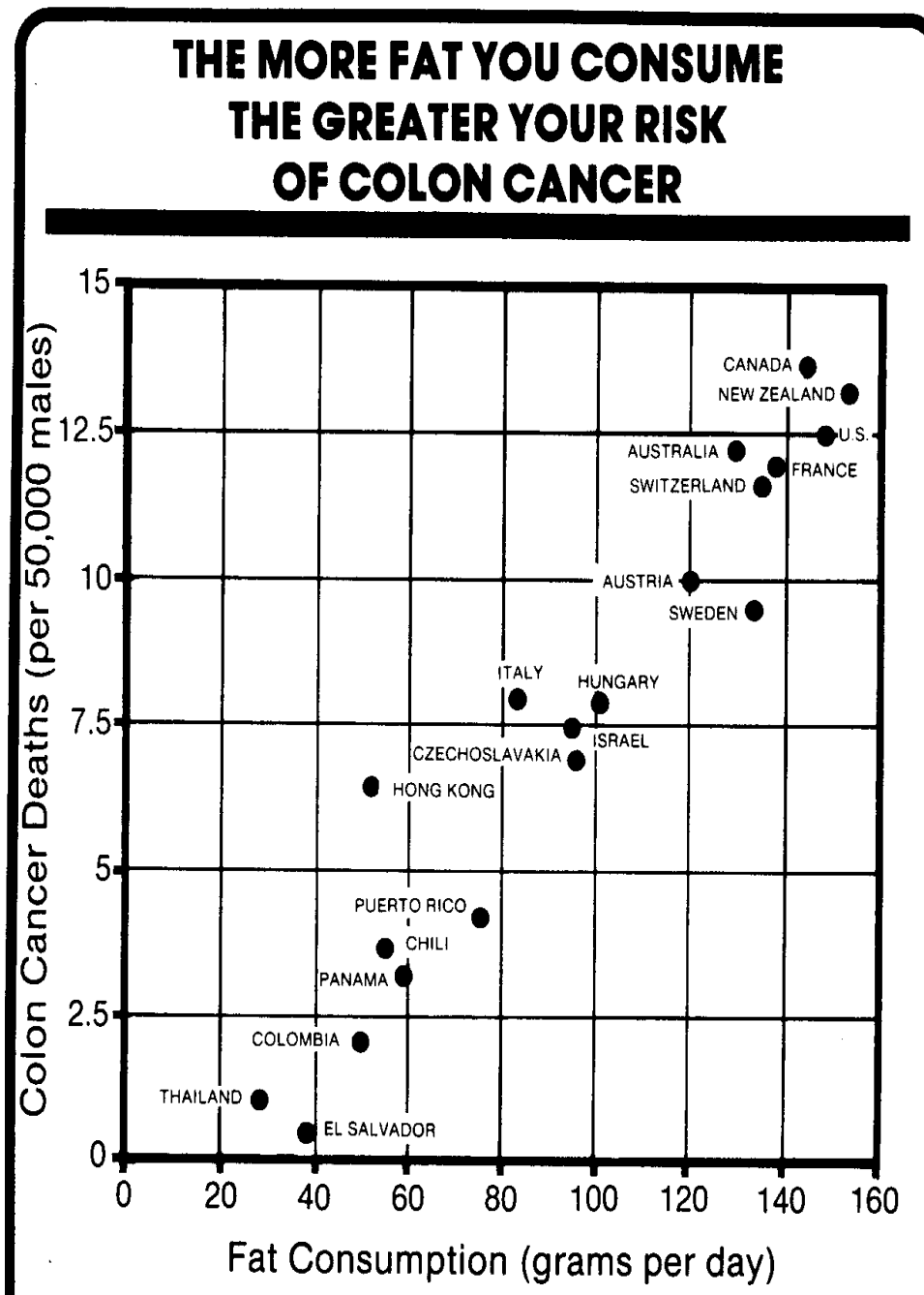
Higher daily quantities of meat consumption correlate with increased colon cancer.

**CHART 8.4: FEMALE COLON CANCER INCIDENCE AND DAILY MEAT CONSUMPTION**

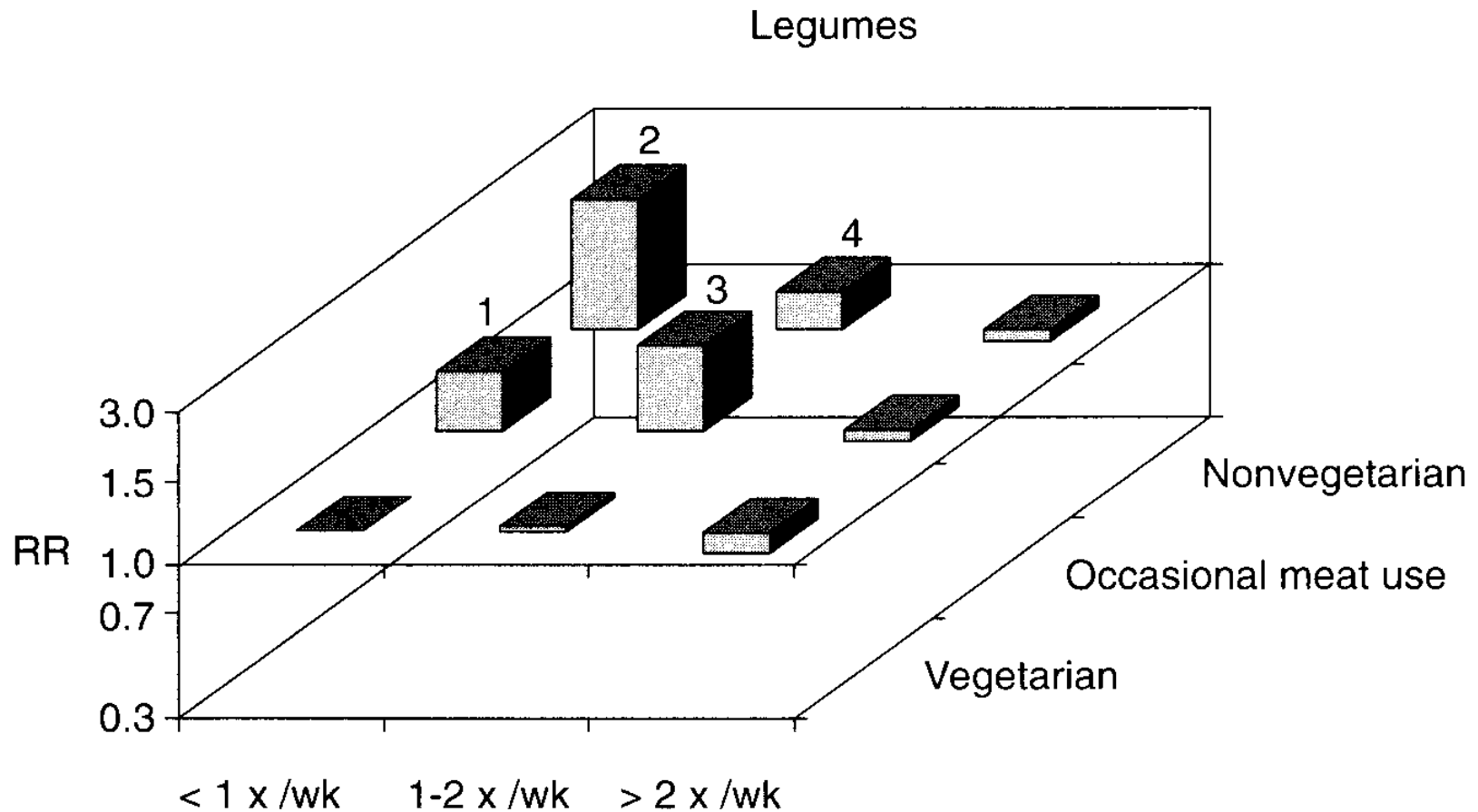


Higher daily fat quantity consumption correlates with increased colon cancer.

J. Robbins, *Diet for a new America*, Walpole NH: Stillpoint, 1987.

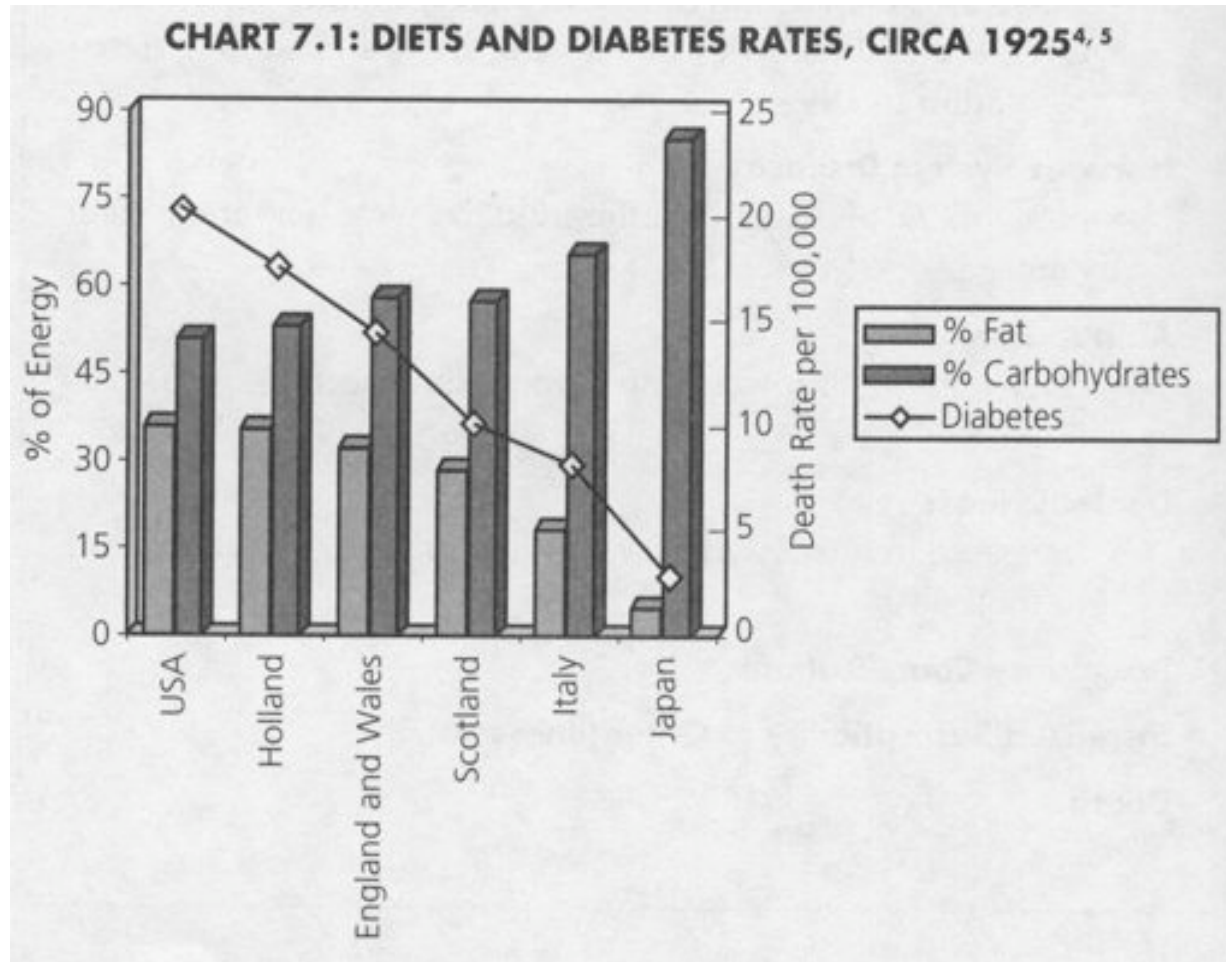


A 2.54 times increase in risk ratio (RR) for colon cancer correlates with non-vegetarians who eat legumes less than once per week.



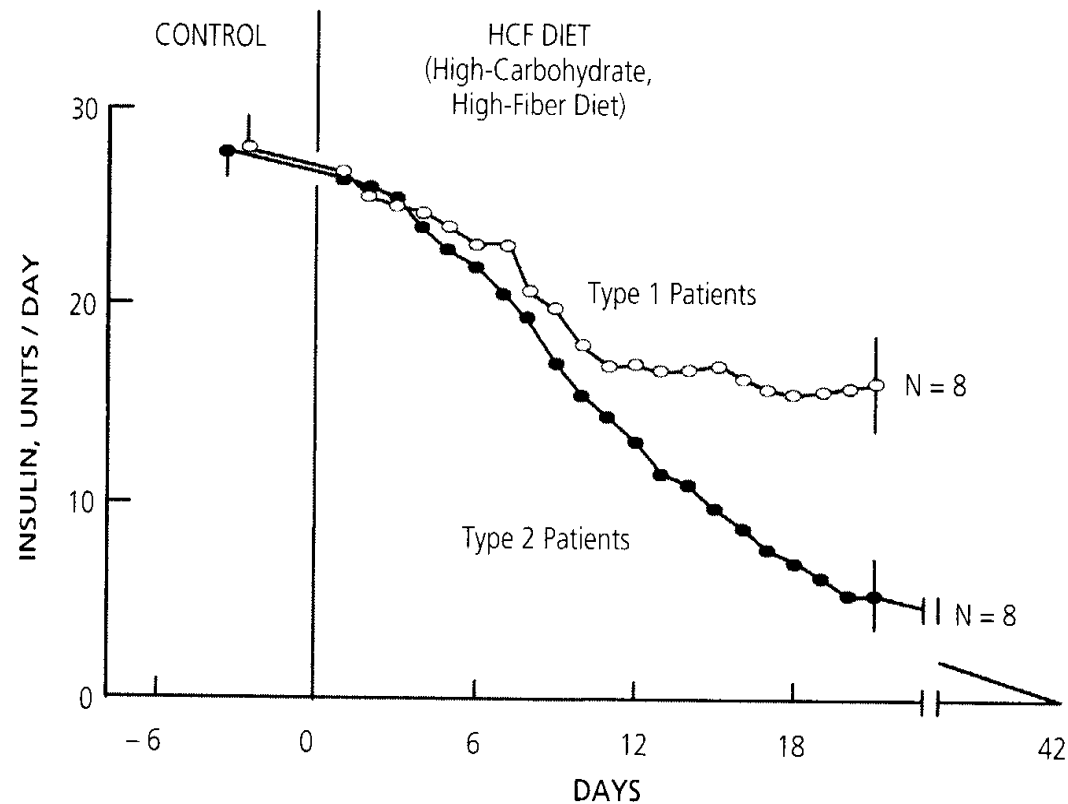
G. E. Fraser, *Diet, life expectancy, and chronic disease*, Oxford: Oxford University Press, 2003.

Decrease of diabetes rate correlates with decreased fat consumption.



A high-carbohydrate, high-fiber, low-fat, plant-based diet lowers the insulin required by both type 1 and type 2 diabetics.

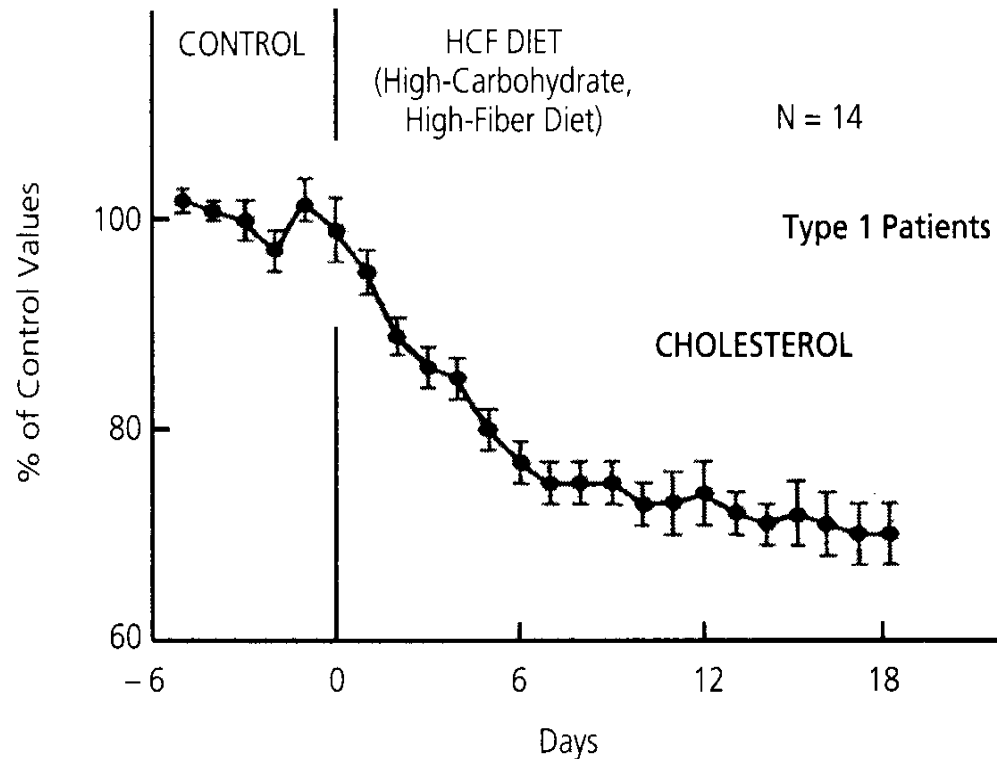
**CHART 7.2: INSULIN DOSAGE RESPONSE TO DIET**





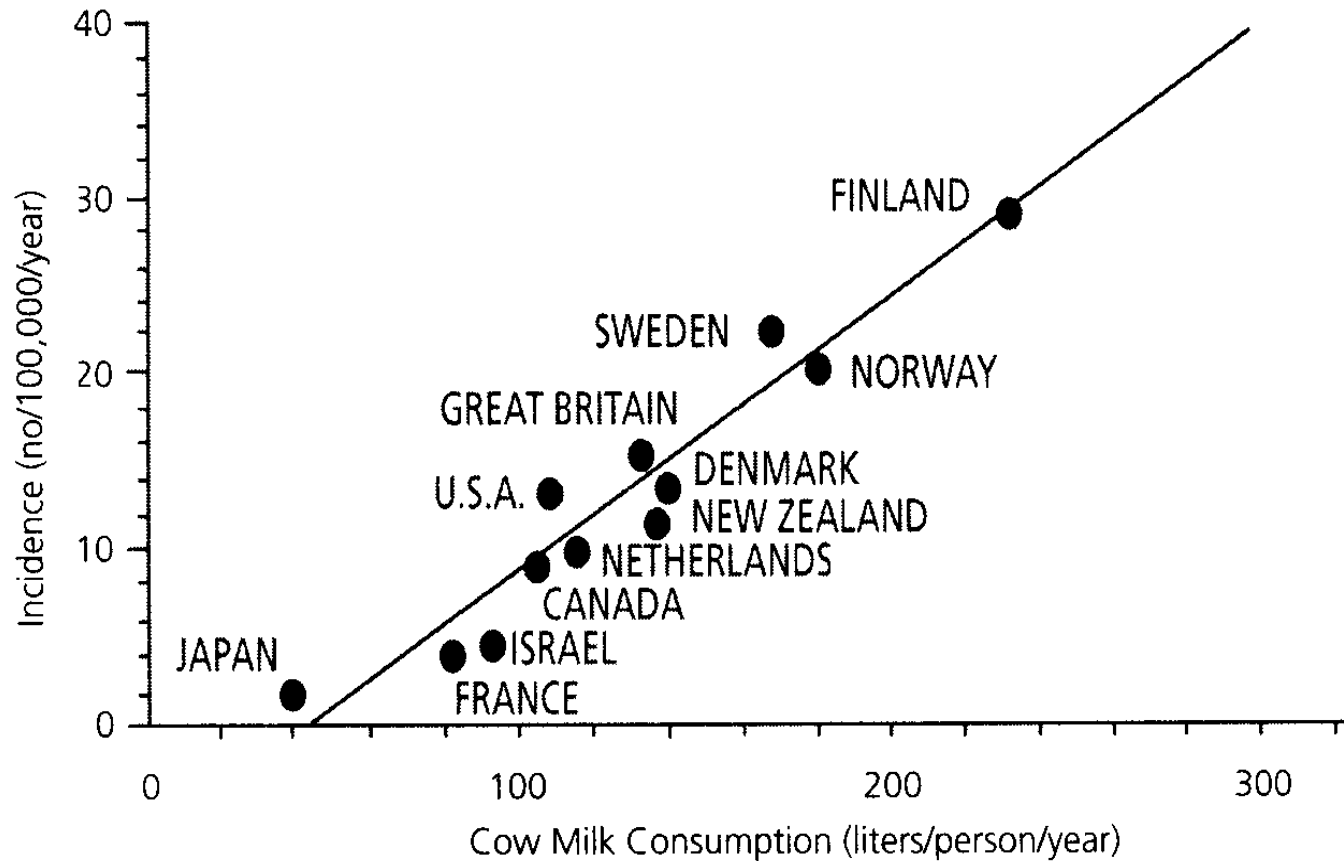
A high-carbohydrate, high-fiber, low-fat, plant-based diet lowers the cholesterol of diabetics.

**CHART 7.3: BLOOD CHOLESTEROL ON HIGH-CARBOHYDRATE, HIGH-FIBER DIET**



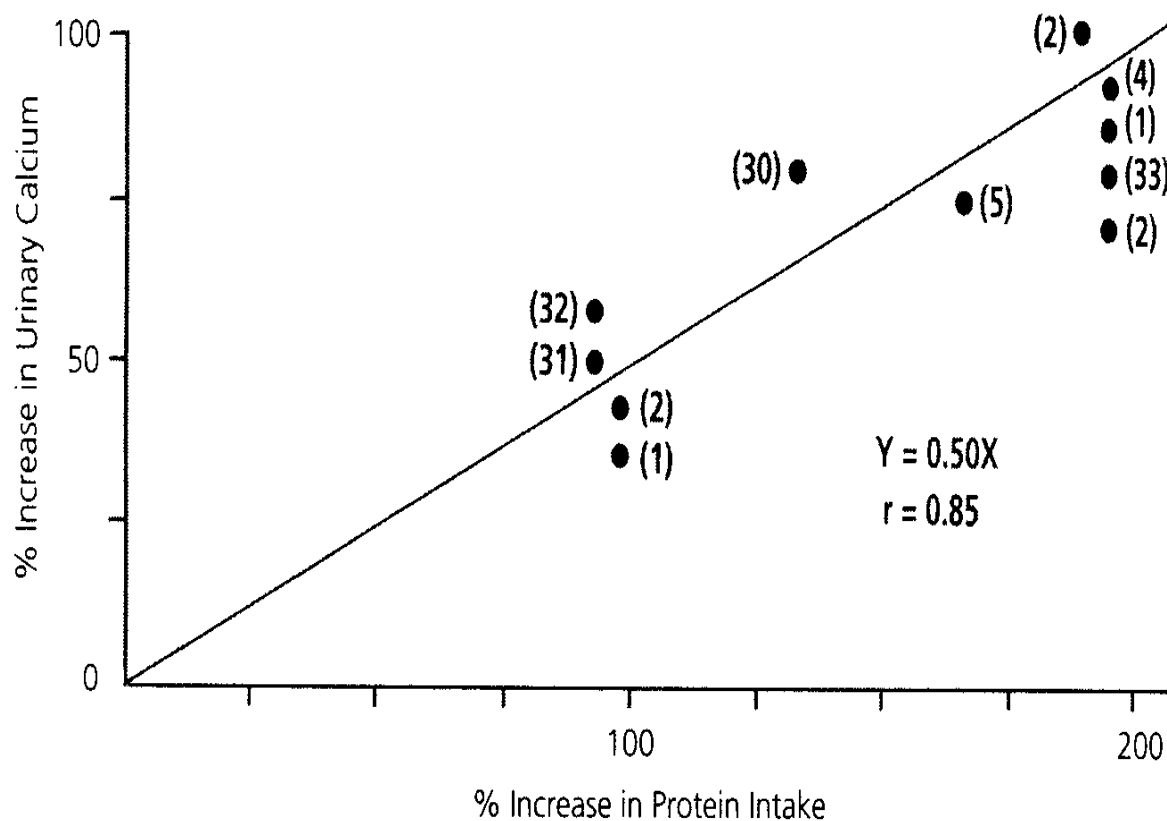
Quantity of cow's milk consumption correlates with increase in type 1 diabetes.

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



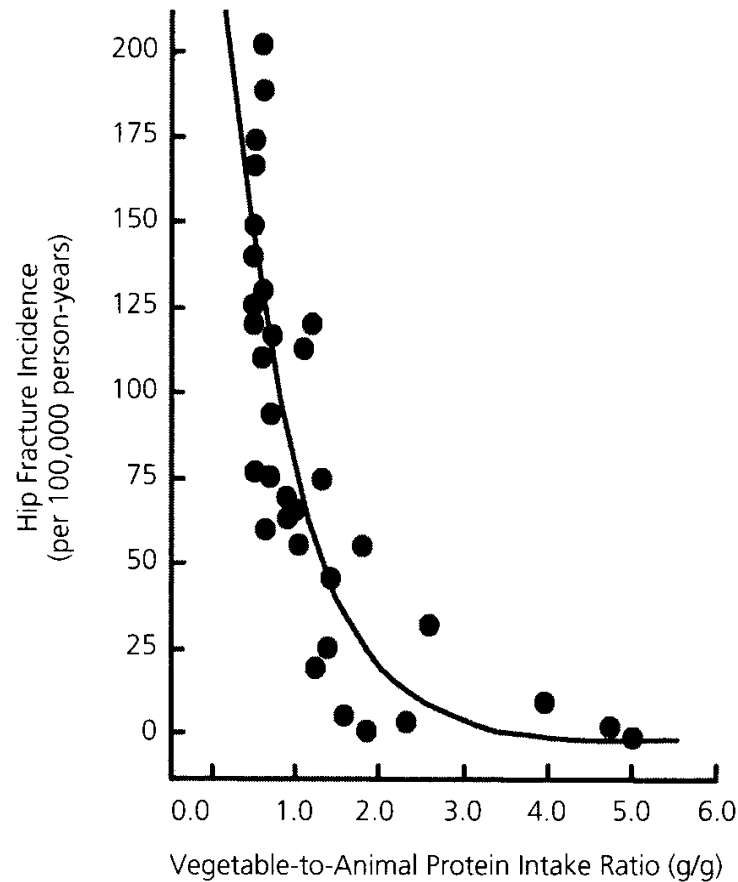
Increased protein (mostly animal) intake correlates with undesirable increases in calcium excreted in the urine.

**CHART 10.1: ASSOCIATION OF URINARY CALCIUM EXCRETION WITH DIETARY PROTEIN INTAKE**



When animal protein intake exceeds vegetable protein intake, the correlation with hip fractures increases dramatically

**CHART 10.2: ASSOCIATION OF ANIMAL VERSUS PLANT PROTEIN INTAKE AND BONE FRACTURE RATES FOR DIFFERENT COUNTRIES**



High protein diets are correlated with calcium deficiency.

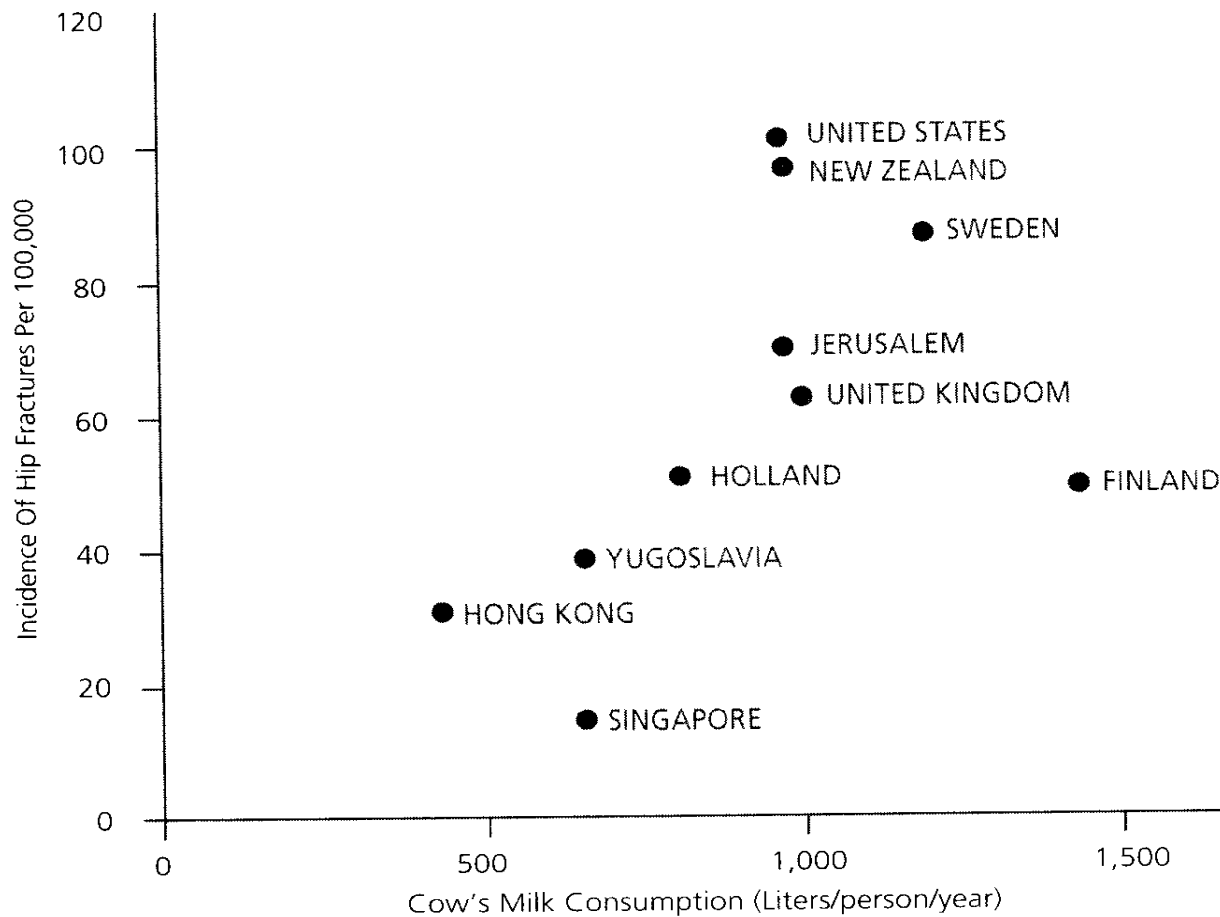
## IS OSTEOPOROSIS DUE TO CALCIUM DEFICIENCY OR EXCESS PROTEIN?

STUDY No.	CALCIUM INTAKE -milligrams-	CHANGE IN CALCIUM BALANCE WITH A LOW-PROTEIN DIET	CHANGE IN CALCIUM BALANCE WITH A HIGH-PROTEIN DIET
1	500	+ 31	-120
2	500	+ 24	-116
3	800	+ 12	-85
4	1400	+ 10	-84
5	1400	+ 20	-65
<b>AVERAGE</b>	<b>920</b>	<b>+ 19</b>	<b>-94</b>

J. Robbins, *Diet for a new America*, Walpole NH: Stillpoint, 1987.

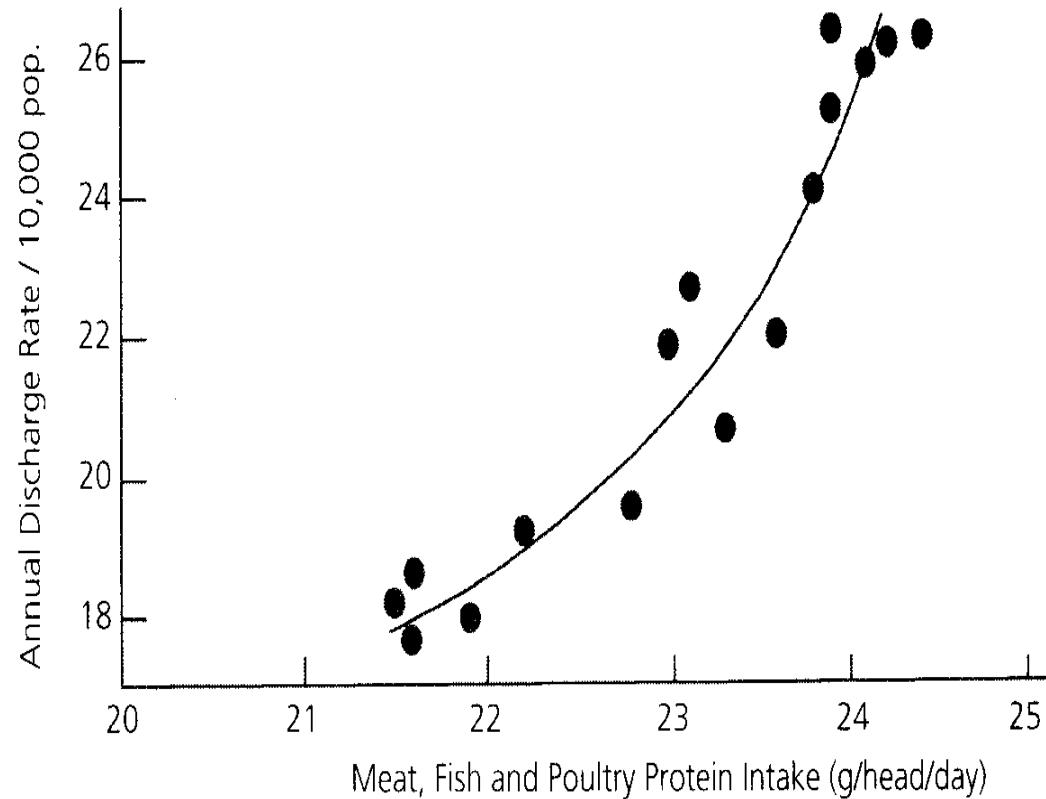
Increased quantity of cow's milk consumption correlates with increased hip fractures.

**CHART 10.3: ASSOCIATION OF RATES OF HIP FRACTURES WITH CALCIUM INTAKE FOR DIFFERENT COUNTRIES**

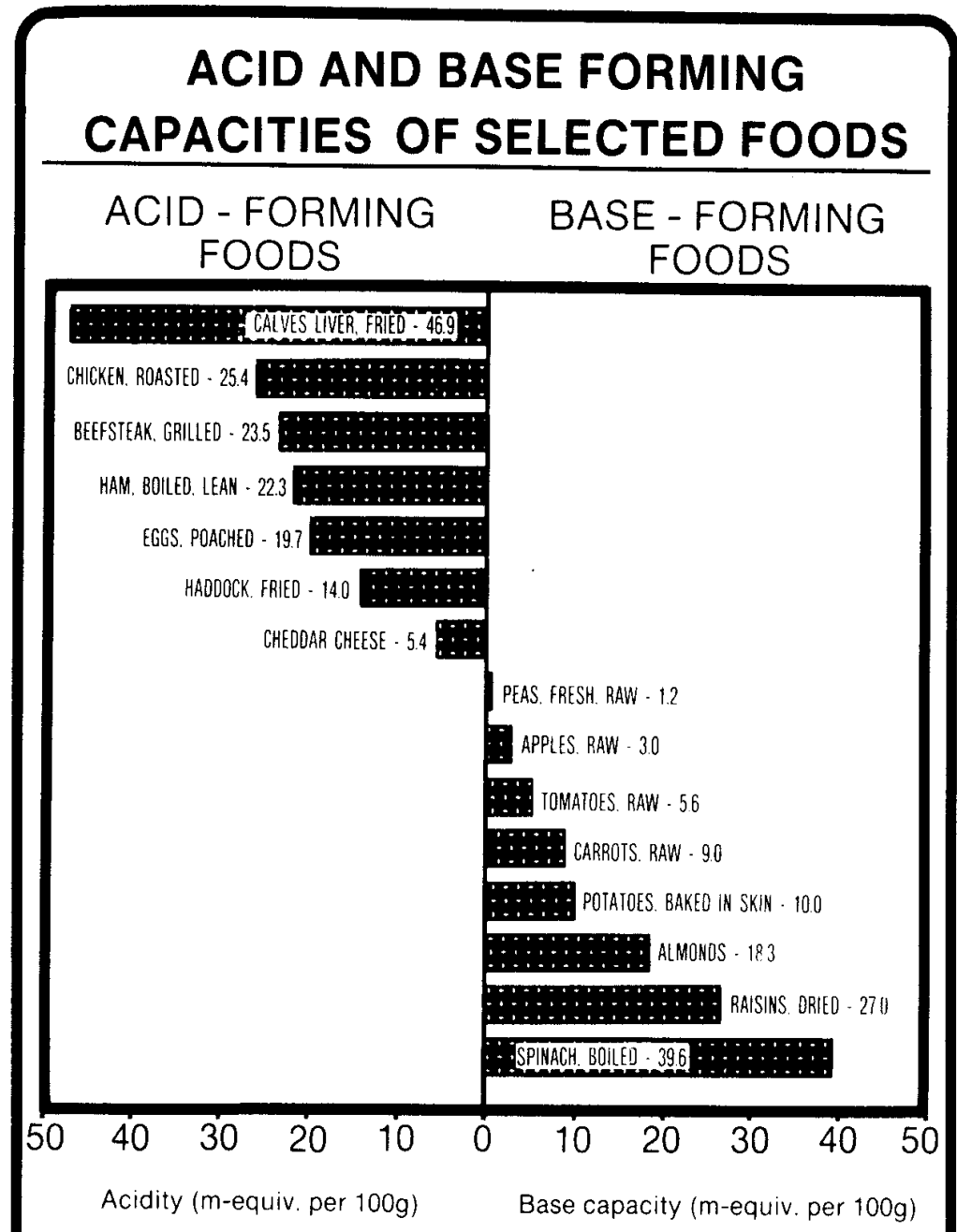


Increased quantity of animal protein intake correlates with increased kidney stones.

**CHART 10.4: ASSOCIATION BETWEEN ANIMAL PROTEIN INTAKE AND FORMATION OF URINARY CALCULI**



Animal-based foods are acid forming whereas plant-based foods are base forming. This may suggest that acid-forming foods are less healthy.

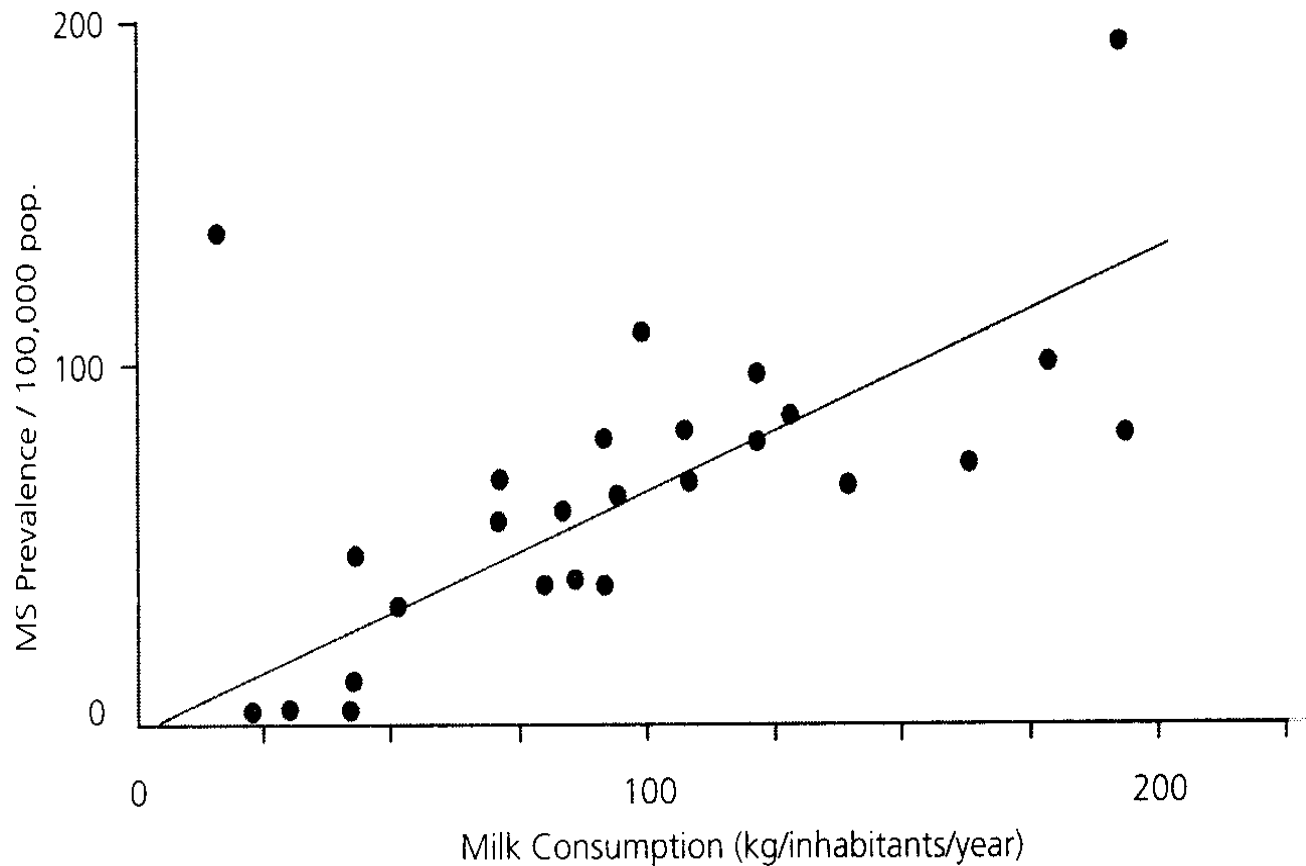


J. Robbins, *Diet for a new America*, Walpole NH: Stillpoint, 1987.

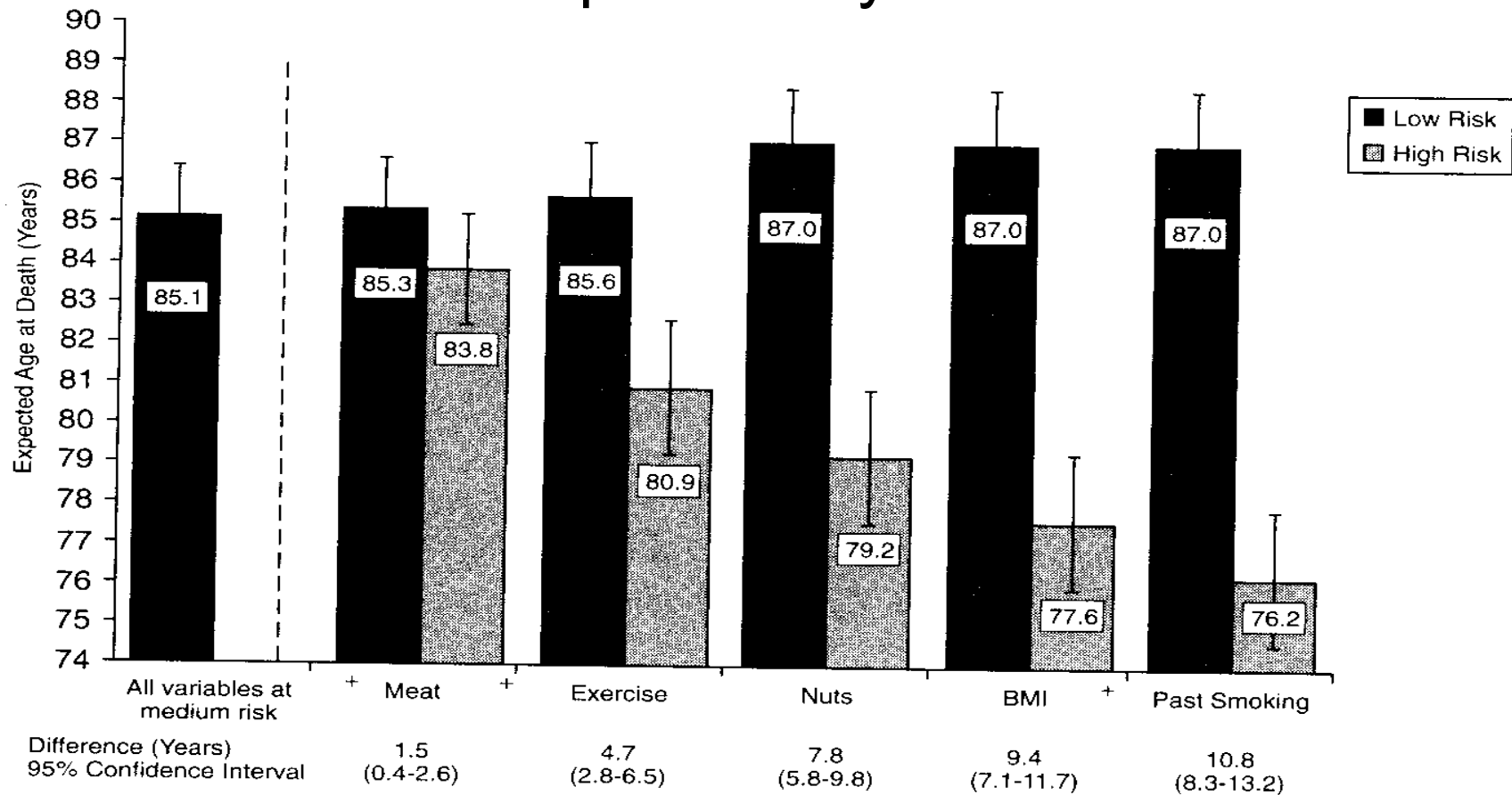


Increased quantity of cow's milk consumption correlates with increased multiple sclerosis.

**CHART 9.5: ASSOCIATION OF COW'S MILK CONSUMPTION AND MULTIPLE SCLEROSIS**

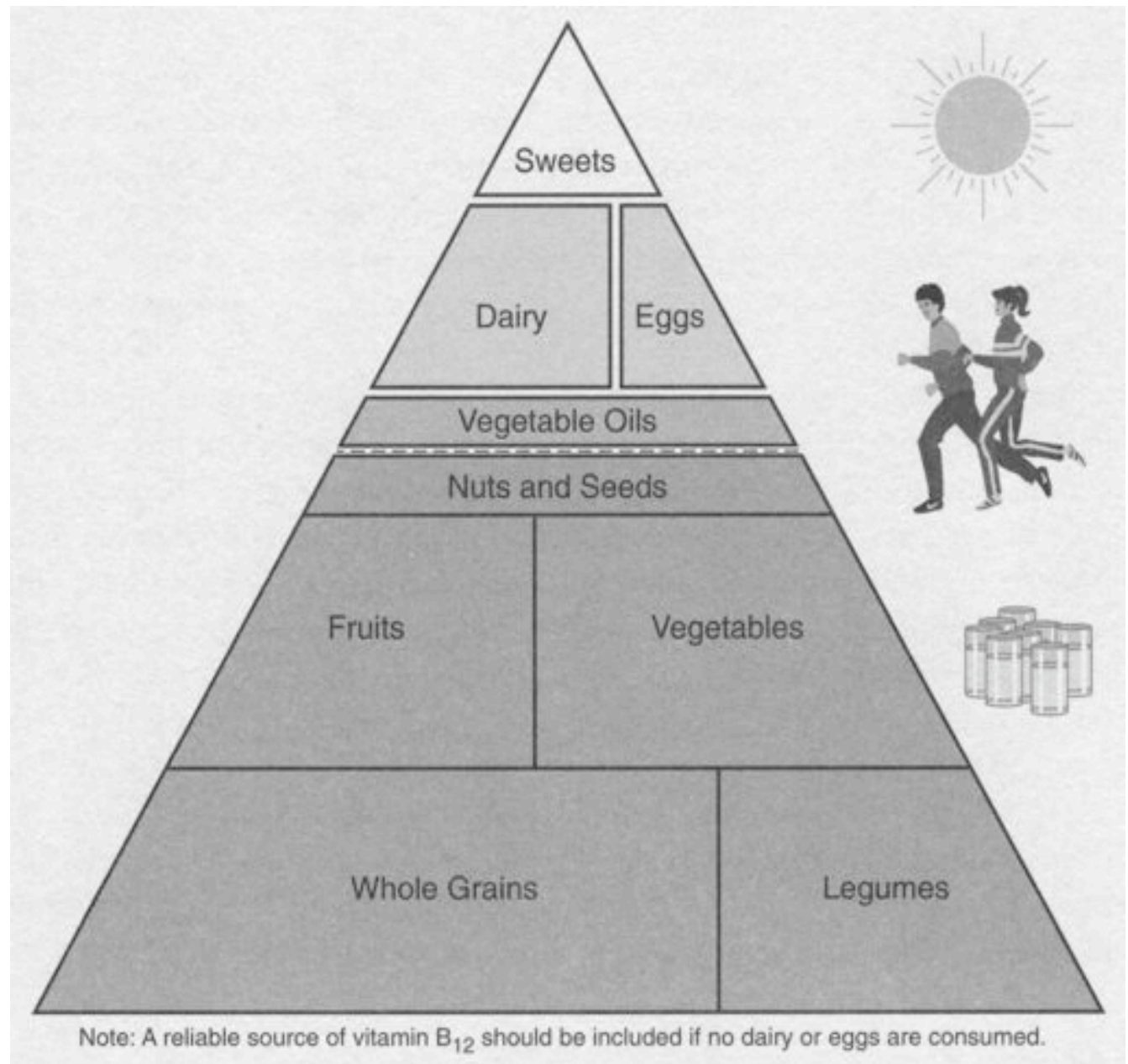


Men's expected age at death increases with a correlation to a diet with nuts, no meat, low body mass index, exercise and not smoking with a difference up to 10.6 years.

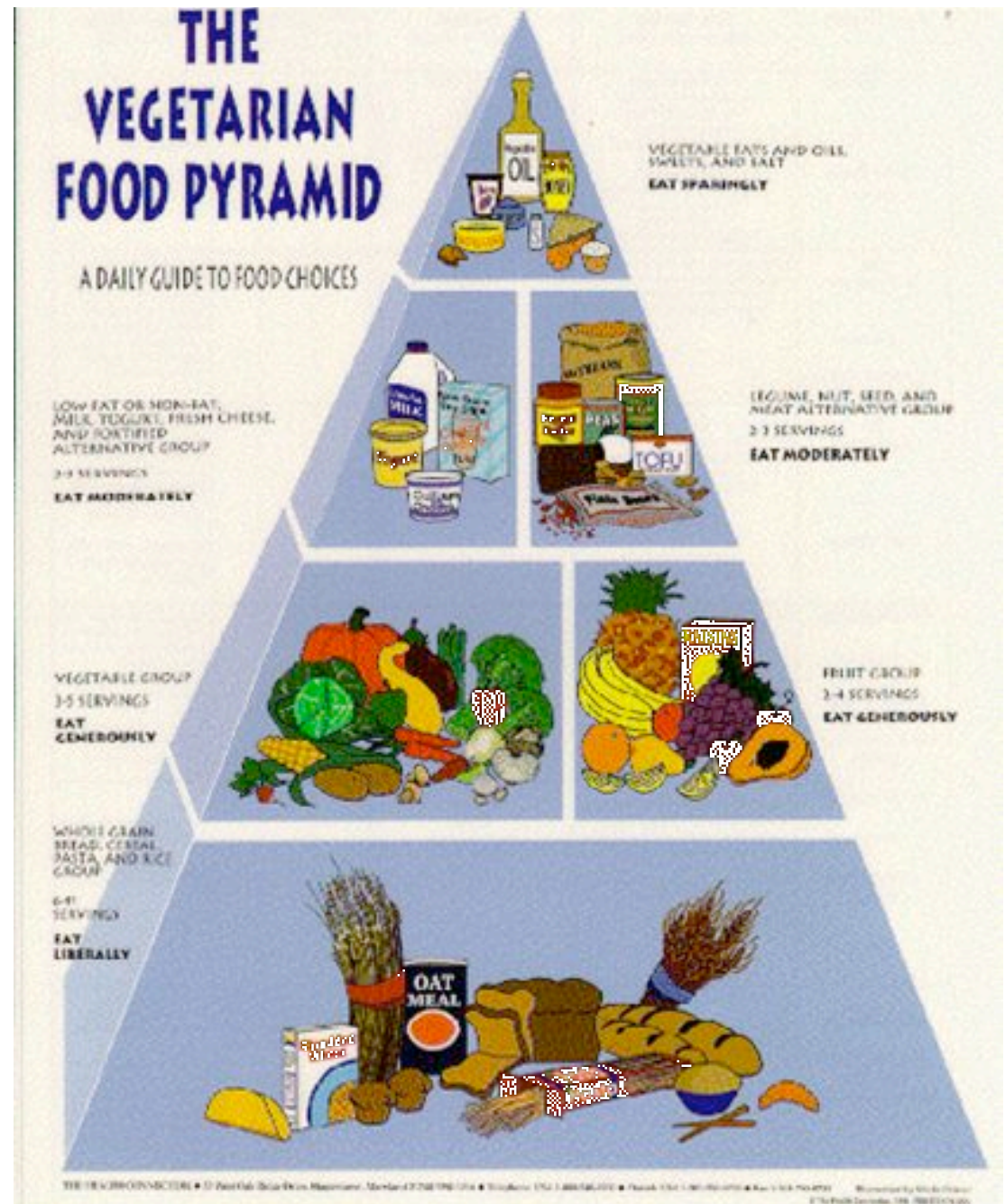


Vegetarian food guide pyramid suggests whole grains, legumes, fruits, vegetables, nuts, seeds, exercise, and water.

G. E. Fraser, *Diet, life expectancy, and chronic disease*, Oxford: Oxford University Press, 2003.



Vegetarian food guide pyramid suggests whole grains, legumes, fruits, vegetables, nuts, seeds, exercise, and water.



Basic dietary principles are not in dispute: eat less; move more; eat fruits, vegetables and whole grains; and avoid too much junk food. (M. Nestle, *What to eat.*)

Sources: T. C. Campbell and T. M. Campbell II, *The China study*, Dallas, TX: Benbella Books, 2006. <http://www.thechinastudy.com/>

J. Robbins, *Diet for a new America*, Walpole NH: Stillpoint, 1987.

G. E. Fraser, *Diet, life expectancy and chronic disease*, Oxford UK: Oxford University Press, 2003.

<http://www.fda.gov/cdrh/ost/trends/TOC.html>

Everywhere you hear people talking about being green.

My opinion is formed by being a Biomedical Engineer, I feel the point is:

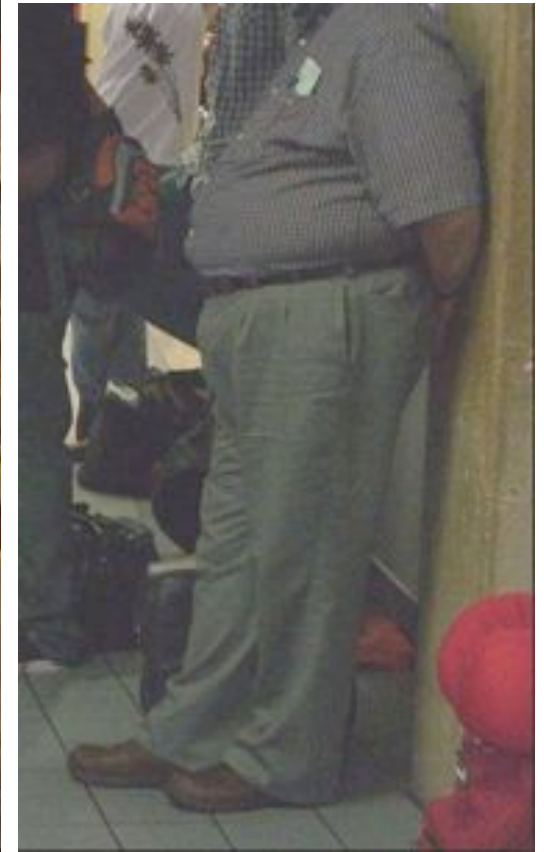
Be kind to yourself and the planet.

Eat right 90% of the time and you can afford different choices 10% of the time.

Make the large majority of your food healthy so you get health-promoting nutrients.

When offered animal products, enjoy a small portion along with enjoying increased portions of plant products.





After age 30, the average American gains 0.5 kg per year





