

# Effect of vegetarianism in heart disease

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- Definition of vegetarian diets are not uniform in studies

- Plant-based foods contain 100,000 disease-preventing nutrients, such as phytochemicals, bioflavonoids, carotenoids, retinols, isoflavones, genistein, lycopene, polyphenols, sulforaphanes, and .....
- They are also low in disease-promoting constituents such as saturated fats, trans fatty acids, dietary cholesterol, and sugar.

# Mortality

- 11000 subjects, 17 y f/u, 43% vegetarian:
  - Daily consumption of fresh fruit is associated with a reduced mortality from ischaemic heart disease, cerebrovascular disease, and all causes combined. (BMJ. 1996 Sep 28;313(7060):775-9.)
- EPIC-OXFORD study, 64232 subjects:
  - Comparing vegetarians with meat eaters among the 47,254 participants who had no prevalent cardiovascular disease or malignant cancer at recruitment, the death rate ratios adjusted for age, sex, smoking, and alcohol consumption were 0.81 (95% CI: 0.57, 1.16) for ischemic heart disease and 1.03 (95% CI: 0.90, 1.16) for all causes of death which was not significantly different. (Am J Clin Nutr 2009;89(suppl):1613S–9S.)

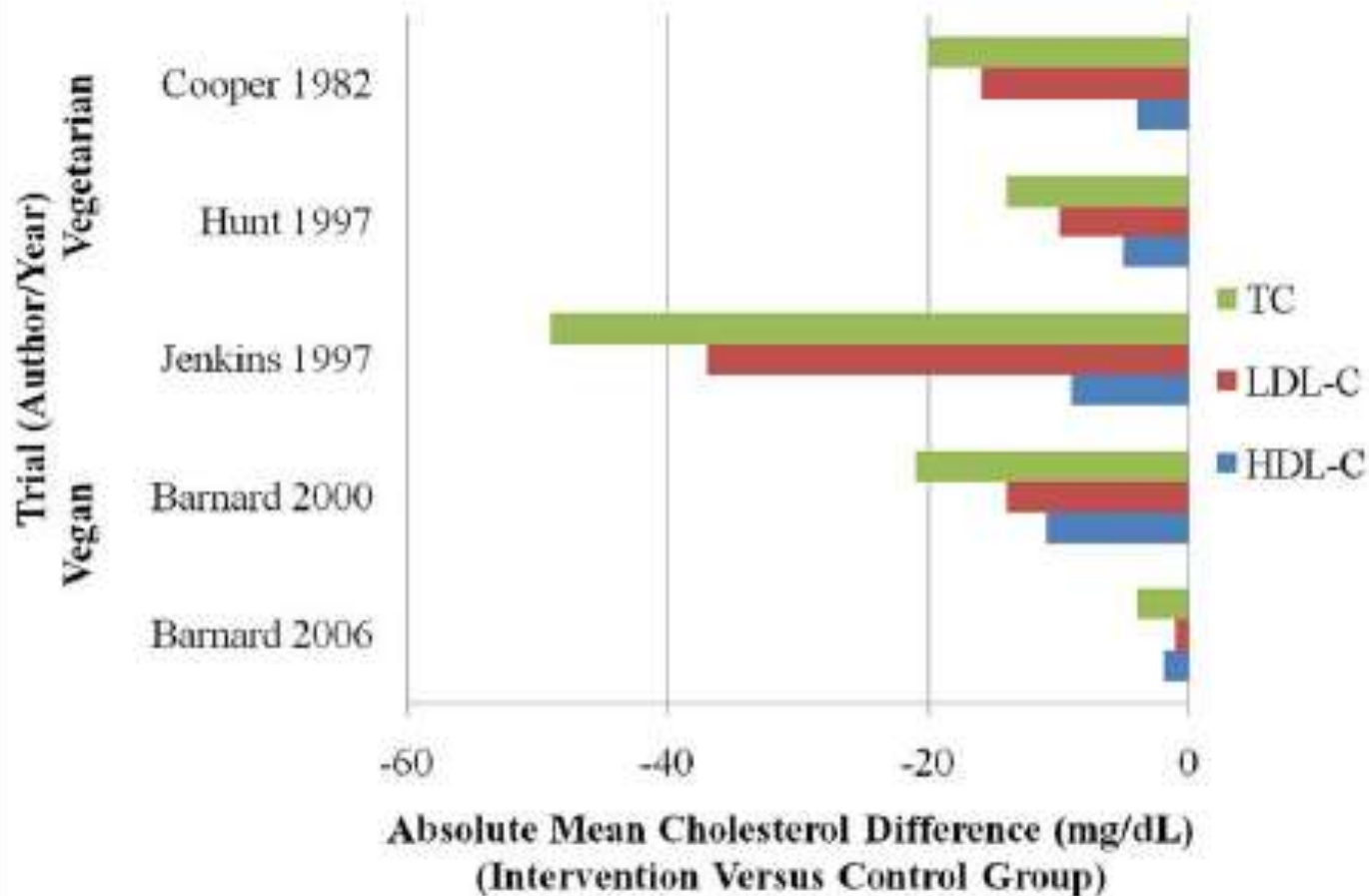
# Cardiovascular Effects

- Compared with nonvegetarians, vegetarians (both lactoovovegetarians and vegans) have a lower risk of death from ischemic heart disease, even after adjustment for body mass index (BMI) and smoking habits.

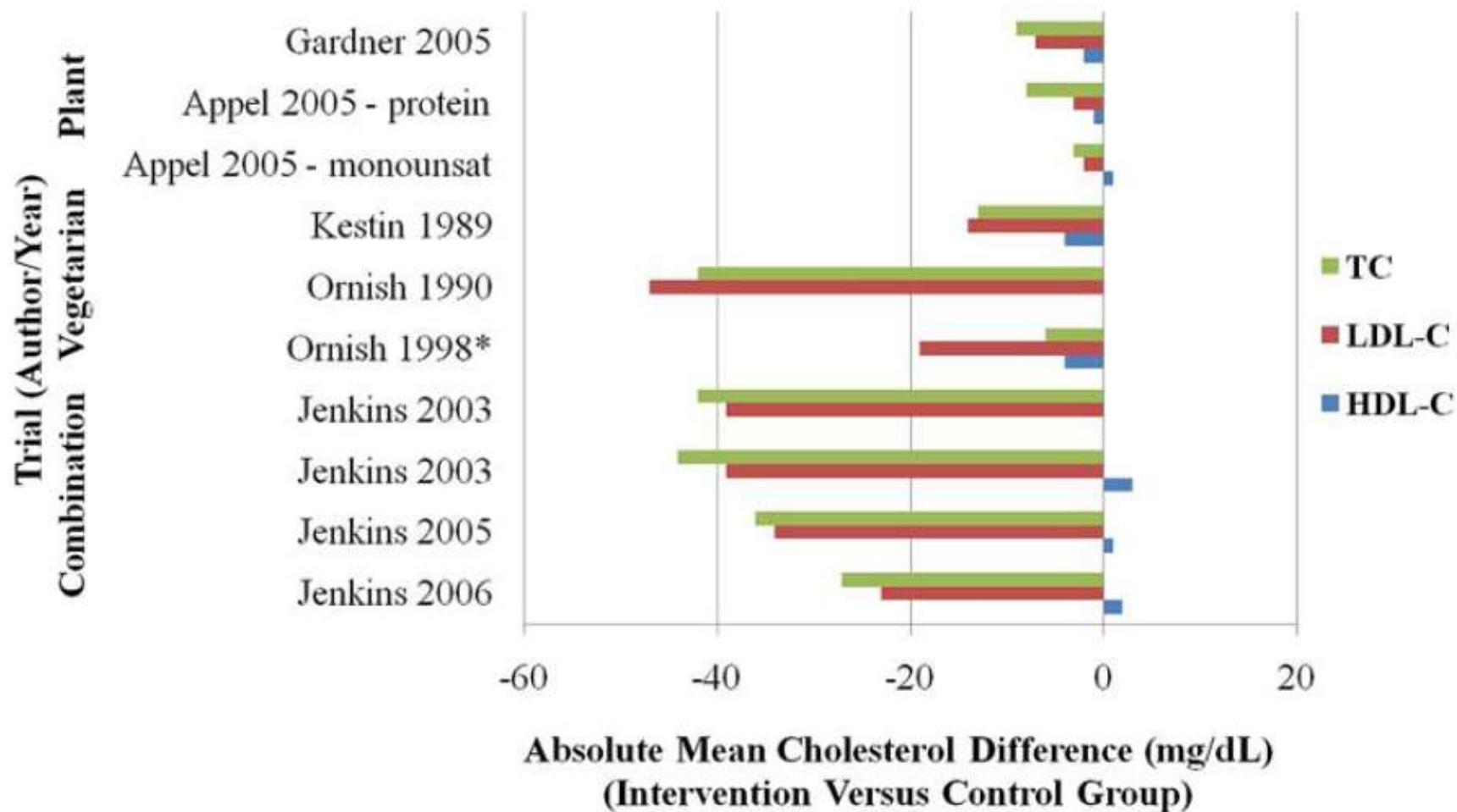
# Factors responsible for this effect

- Lowering lipids (LDL by 25-30 %)
- Direct effects of fruits and vegetables, whole grains, soy protein, and nuts
- Flavonoids (reducing platelet aggregation and blood clotting, acting as anti-inflammatory agents, and improving vascular endothelial function.)
- Lowering blood pressure

## Effects of Plant-Based Diets in Normolipidemic Individuals: Randomized Controlled Trials



## Effects of Plant-Based Diets in Hyperlipidemic Individuals: Randomized Controlled Trials



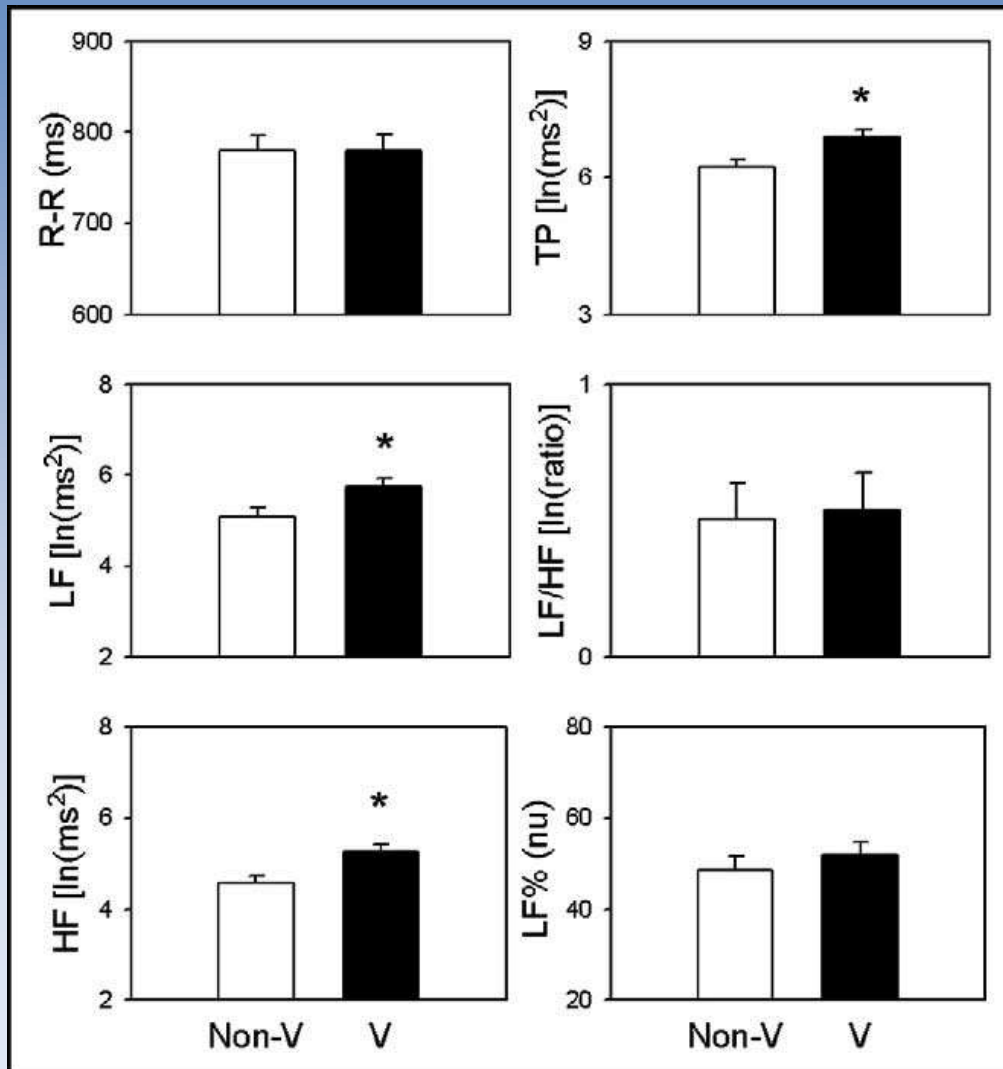
\*5 year follow-up of Ornish 1990



# **Hypertension and blood pressure among meat eaters, fish eaters, vegetarians and vegans in EPIC–Oxford**

- Age-adjusted prevalence of self-reported hypertension was significantly different between the four diet groups(meat,fish,veg,vegan),
- From 15.0% in male meat eaters to 5.8% in male vegans,
- From 12.1% in female meat eaters to 7.7% in female vegans,
- Fish eaters and vegetarians having similar and intermediate prevalences

# Effects of Long-Term Vegetarian Diets (> 2 Y) on Cardiovascular Autonomic Functions in Healthy Postmenopausal Women



# Obesity

- BMI values are reported to be higher in nonvegetarians compared with vegetarians for both men and women, and BMI values tend to increase as the frequency of meat consumption increases.
- Among vegetarians, vegans have the lowest BMI values of all vegetarians.
- It appears that one must follow a vegetarian diet for about 5 years before its benefits are seen.

# Diabetes

- Vegetarians have significantly lower rates of developing type 2 diabetes than do omnivores.
- Lower BMI and lack of meat consumption may play a role
- A low-fat, fiber-rich vegan diet with a low to modest glycemic load considerably improved glycemic control in persons with type 2 diabetes mellitus, with 43% of the subjects reducing diabetes medication after 5 months
- The risk of developing diabetes mellitus for those consuming nuts 5 or more times a week was 27% lower than those almost never eating nuts after adjustment for BMI

# 1-3 weeks at a raw vegan institute

Table 2 Change in quality of life

Scale: 0–100	Baseline	12-week follow-up	p-value
Overall quality of life*	65.4	72.9	0.001
% who said health is somewhat or much better than one year ago better than one year ago	26%	51%	0.03
Mental component			
Summary score	40.8	46.7	<0.001
Physical component			
Summary score	48.9	50.1	0.26
Physical functioning	77.2	78.5	0.54
Role physical	68.8	77.0	0.04
Bodily pain	66.0	71.8	0.18
General health	65.3	73.4	0.001
Vitality	48.7	59.0	0.001
Social functioning	65.9	75.5	0.03
Role emotional	67.2	75.3	0.02
Mental health	62.7	72.8	<0.001
Dietary quality of life**			
Taste	73.0	77.3	0.14
Convenience	62.1	61.1	0.85
Cost	55.3	55.3	1.00
Self-care	55.3	70.3	<0.001

\* SF-36. All values represent means scores, unless otherwise specified.

\*\* Quality of life related to dietary change questionnaire.

# Precautions

**Table 1.** Mean Intakes of Selected Vitamins and Minerals and Linolenic Acid ( $\omega$ -3)  
Among Vegetarians and Nonvegetarians<sup>a</sup>

Nutrient	Dietary Group	Male	Female	n	Years of Publications	DRI for Male <sup>b</sup>	DRI for Female <sup>b</sup>
Calcium, mg	NV	946	898	10	1997-2003	1000	1000
	LOV	906	875				
	VG	755	622				
Iron, mg	NV	15.1	11.3	10	1997-2003	8	18
	LOV	17.6	14.7				
	VG	20.4	17.8				
Zinc, mg	NV	12.2	10.1	9	1997-2003	11	8
	LOV	10.3	8.5				
	VG	11.0	9.0				
Vitamin D, mcg	NV	3.4	3.6	8	1989-2003	5	5
	LOV	2.0	2.1				
	VG	1.0	0.8				
Vitamin B <sub>12</sub> , mcg	NV	7.3	5.4	10	1991-2003	2.4	2.4
	LOV	2.7	2.1				
	VG	1.0	1.0				
18:3 $\omega$ -3, mg	NV	1.5	1.2	4	1984-1999	1.6	1.1
	VG	2.0	1.6				
	VG	1.9	1.4				

DRI, Dietary Reference Intake; LOV, lacto-ovo-vegetarian; NV, nonvegetarian; VG, vegan.

<sup>a</sup>Data from reference 6.

<sup>b</sup>DRIs are for 19-50 years of age. For iron, calcium and vitamin D values will be different for adults over 50 years of age.

- **Vegan**

- less amounts of dietary calcium, vitamin D, and vitamin B12
- with less allergies (since milk and eggs are absent)
- typically has a reduced saturated fat and cholesterol intake
- Are thinner, had lower blood levels of total and LDL cholesterol with a lower risk of CVD,
- modestly lower blood pressure levels, and lower incidence of stroke and diabetes mellitus

- **Lactoovovegetarian**

- More calorie dense and maybe better for maintaining childhood growth and weight
- more amounts of dietary calcium, vitamin D, and vitamin B12
- ? Less of risk of reduced BMD



# Concerns regarding strict raw vegan diet

- Very limited number of studies
- Low Vit B12 consumption and high homocysteine level(?cardiovascular risk)
- Low HDL
- Low calcium,
- Low bone density(Arch Intern Med. 2005 Mar 28;165(6):684-9)
- Low Zinc

# Cancer

- Vegetarians tend to have an overall lower cancer rate than does the general population
- Breast, colon, prostate cancers
- However, human population studies have not shown large differences in cancer incidence or mortality rates between vegetarians and nonvegetarians.
- Epidemiological studies have consistently shown that regular consumption of plant foods, such as fruit and vegetables, is strongly associated with a reduced risk of cancer. Fruit, vegetables, whole grains, and legumes contain a complex mixture of phytochemicals possessing potent antioxidant, antiproliferative, and cancer-protective activity
- Perhaps lower BMI and lack of consumption of meat and processed food play a greater role.

# Osteoporosis

- Cross-sectional and longitudinal population-based studies suggest no differences in bone mineral density (BMD), for both trabecular and cortical bone, between omnivores and lacto-ovo-vegetarians, so that the risk of bone fractures is similar for both groups.
- bone density is lower among vegans compared with nonvegetarians (related to lower Ca intake)
- Femoral neck and lumbar spine BMD of premenopausal women was about 15% to 20% higher for women in the highest quartile of potassium intake compared with those in the lowest quartile (fruits and vegetables)
- Results from 2 large, prospective cohort studies suggest an inverse relationship between vitamin K (and green, leafy vegetable) intake and risk of hip fracture
- Consumption of soy appears to be favorable to bone health. Soy isoflavones have demonstrated a significant benefit on spine BMD by inhibiting bone resorption and stimulating bone formation compared with placebo

# Fibromyalgia

- Mostly raw vegetarian diet (7 months) improved fibromyalgia symptoms in 19 out of 30 patients.(small observational study with loose monitoring of intake, low intake of animal products)