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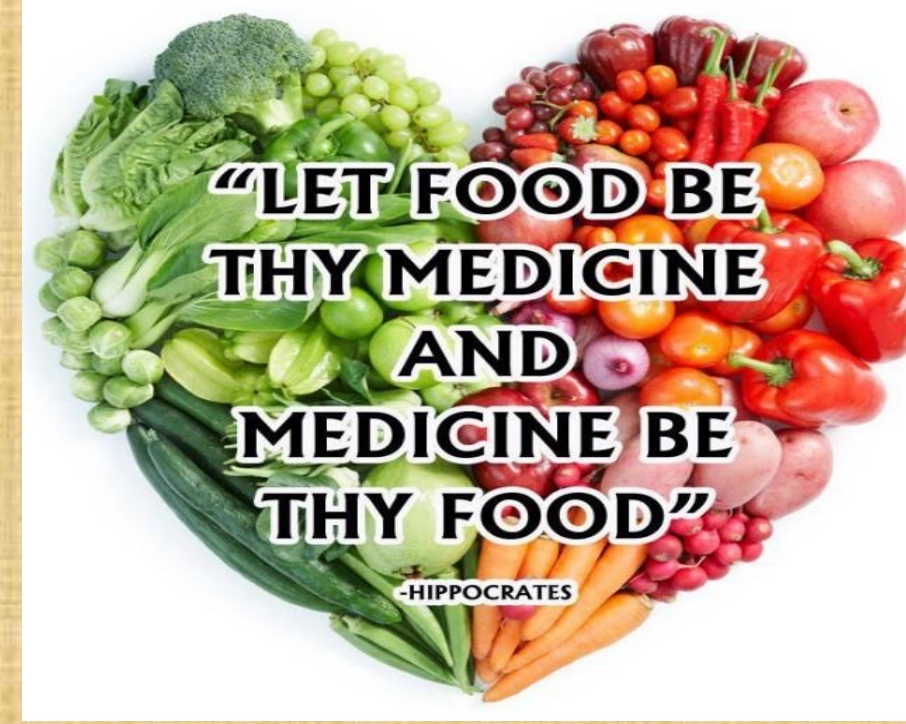
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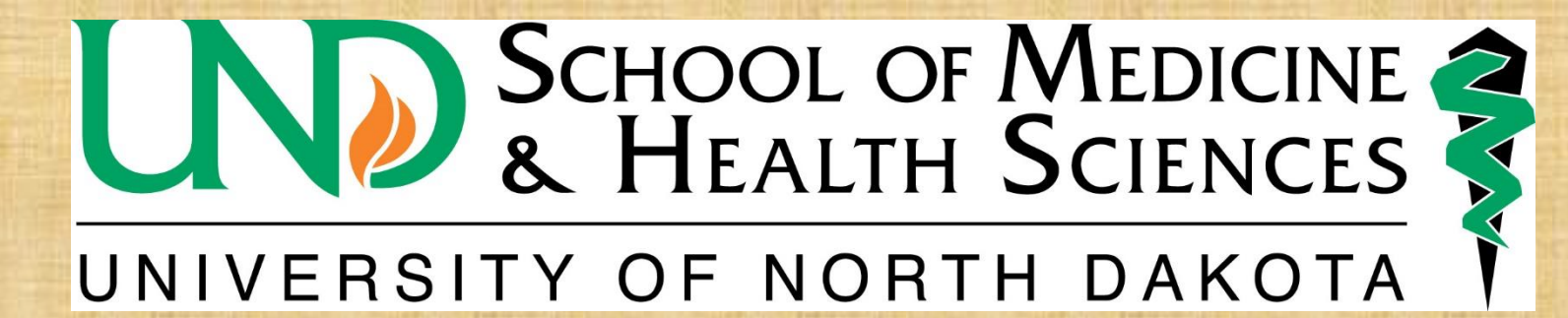
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# Does Adherence to a Plant-Based Diet Cause a Statistically Significant Decrease in the Risk of Cardiovascular Events?



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## Abstract

- One of the current problems in many affluent societies is the straightforward access to convenience and fast foods. Although these selections have suitability for today's fast-paced world, overall nutritional value becomes the martyr of such practices. It is a logical thought that there could be a correlation between this nutritional pattern and the ever-increasing presence of obesity, cardiovascular disease, type 2 diabetes mellitus, hypertension, dyslipidemia, cancer, and other conditions carrying a proverbial death sentence.
- The intent of this review of the literature was to determine the effect a plant-based diet versus an omnivorous diet would have on adults, aged 18-65, and ultimately, seek out statistically significant information that would point to proving the benefits a plant-based diet can have in producing an overall reduced risk of a cardiovascular event.
- The information obtained was done so through careful systematic review of studies that presented respectable, reproducible, and effective research methods, with the anticipation that there existed noteworthy proof that a plant-based diet, be it vegan, vegetarian, lacto-vegetarian, ovo-vegetarian, etc., can serve as an effective and sustainable means of lowering cardiovascular disease risk. While it is essential that additional studies with larger participant populations be conducted on this subject, current evidence necessitates an emphasis on dietary intervention as a primary vehicle of risk reduction for cardiovascular events, which can lead to both greater quantity and quality of life.

## Research Questions

- What are some risk factors of cardiovascular disease?
- What is the profile of someone who follows an omnivorous diet?
- Are there any known effects of a plant-based diet on the treatment of cardiovascular disease?
- Are there any known effects of a plant-based diet on the treatment of other chronic disease?
- What is the profile of someone who follows a plant-based diet?
- Is there a role for this information in reactionary and preventative models of medicine?

	Vegetarian/vegan	Pesco-vegetarian	Non-vegetarian	Pvalue, vegetarian/vegan v. pesco-vegetarian	Pvalue, vegetarian/vegan v. non-vegetarian	Pvalue, pesco-vegetarian v. non-vegetarian
A. Not adjusted for BMI						
Systolic BP (mmHg)	119.8	123.5	121.1	0.25	0.57	0.43
Diastolic BP (mmHg)	74.3	75.8	74.9	0.44	0.67	0.62
Fasting blood glucose (mg/dl)	82.6	90.7	89.9	0.004	0.0003	0.75
TC (mg/dl)	177.6	183.7	187.6	0.29	0.013	0.46
LDL-C (mg/dl)	110.9	119.1	120.5	0.14	0.014	0.77
BMI (kg m <sup>-2</sup> ), females	27.8	28.3	31.1	0.72	0.0004	0.018
BMI (kg m <sup>-2</sup> ), (males)	26.9	27.2	30.7	0.84	0.0007	0.012
BMI (kg m <sup>-2</sup> ), both sexes	27.3	27.6	30.7	0.74	<0.001	0.0006
WC (cm), females	88.1	89.0	95.6	0.75	0.0004	0.017
WC (cm), males	95.5	94.7	103.5	0.82	0.0035	0.0093
WC (cm), both sexes	91.6	91.6	99.2	0.99	<0.0001	0.0003
HDL-C (mg/dl)	51.5	49.9	49.4	0.47	0.18	0.80
TAG (mg/dl)	101.8	100.6	104.7	0.89	0.64	0.59
B. Adjusted for BMI						
Systolic BP (mmHg)	121.1	124.6	120.8	0.29	0.88	0.21
Diastolic BP (mmHg)	75.3	76.6	74.7	0.51	0.66	0.29
Fasting blood glucose (mg/dl)	84.8	91.9	90.4	0.019	0.0090	0.60
TC (mg/dl)	178.0	184.2	187.5	0.29	0.021	0.53
LDL-C (mg/dl)	111.6	119.8	120.3	0.14	0.027	0.92
HDL-C (mg/dl)	50.2	48.6	49.9	0.47	0.86	0.51
TAG (mg/dl)	105.9	104.7	103.3	0.89	0.68	0.85

## Literature Review

- Atherosclerotic plaques are formed in the presence of an overproduction of inflammatory products within the coronary arteries. These vessels are lined with vascular endothelial cells which are responsible for providing a neutral environment that allows leukocytes, platelets, and nitric oxide to exist and be produced at a stable rate. When there is an insult to the VECs, they become dysfunctional and signal the initiation of an inflammatory response.
- Continual inflammation leads to the narrowing and eventual occlusion of a coronary artery, thereby cutting off the life-giving supply of blood to the myocardium, which can lead to ischemia, infarction, or death.
- Hypertension is a byproduct of fluid retention initiated through the intake of elevated levels of sodium, which are common to prepared meats and processed foods.
- 82% of patients who adhered to a plant-based diet over the course of a one year trial were measured to have a recession of atherosclerotic disease, as well as 91% reporting a reduced occurrence of angina, decreasing the need for coronary artery disease interventions, such as percutaneous intervention or CABG (P < .001).
- A plant-based diet can be more effective than the recommended American Heart Association diet at improving CVD risk factors.
- When paired with wellness-promoting activities, a balanced, nutritious plant-based diet has been shown to dramatically lower the incidence of hypertension, hyperlipidemia, obesity, type 2 diabetes mellitus, and gastrointestinal conditions such as colorectal cancer and gallbladder disease, as outlined in a study of over 27,000 adult subjects.

Anthropomorphic, laboratory, and clinical findings by date.

Measure	September 2012	January 2013	October 2013	September 2014
Body mass index (kg m <sup>-2</sup> )	26	22	21	21
Blood pressure (mmHg)	140/80	112/70	126/72	124/72
Total cholesterol (mg/dL)	234	148	125	138
Triglycerides (mg/dL)	165	155	126	120
HDLc (mg/dL)	43	34	27	36
LDLc (mg/dL)	158	83	73	78
Functional capacity	Walk 1-2 blocks	Walk 1 mile	Jog 2 miles	Jog 4+ miles

HDLc: high-density lipoprotein cholesterol; LDLc: low-density lipoprotein cholesterol.

## Discussion

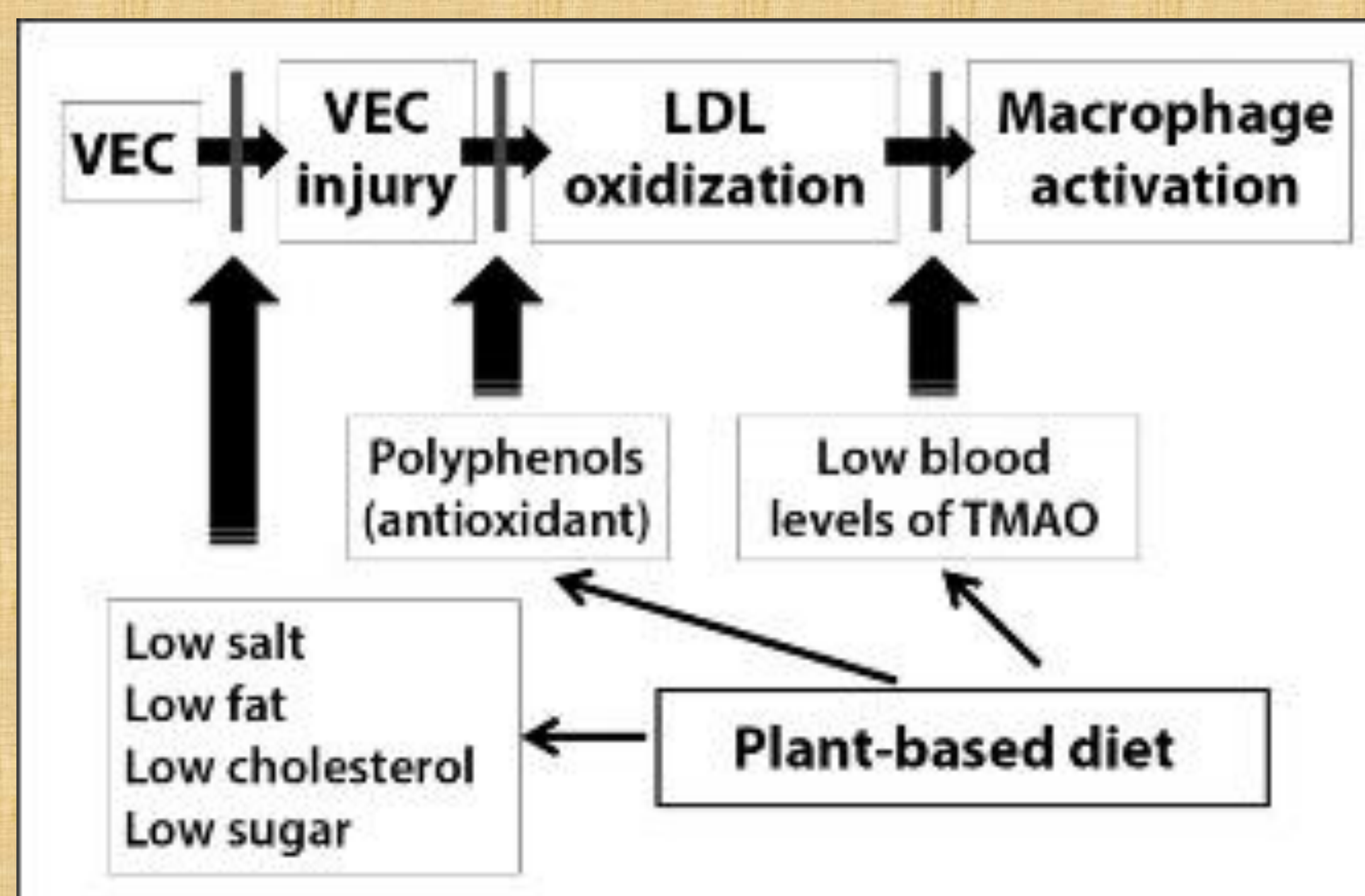
- Greater numbers of both research subjects and studies would allow for less assumption to be made about the theory that plant-based diets can have a measurable, positive outcome.
- The practice of adding high amounts of sodium to many vegetarian or vegan foods is a common method to increase the palatability of items that may not have much in terms of natural flavor.
- Research has established that the elimination of plaque-forming animal fats will decrease the contraction of ischemic heart and systemic vessel disease.
- Any reduction in meat consumption has the potential to improve outcomes in not only cardiovascular disease prevention but also type II diabetes mellitus, which, in and of itself, is a major contributing factor to cardiovascular disease advancement.

## Clinical Applicability

- It is imperative to employ an offensive line of prevention before sending in a medicinal and interventional defensive line, should there be hope of diminishing the noxious wave of chronic disease.
- Current evidence supports the idea that CVD risk can be reduced by a dietary pattern that provides more plant sources of protein in comparison to the typical American diet.
- Providers should encourage their patients to make both dietary and activity changes in small increments, as a means of ensuring long-term adherence and confidence in their ability to find ownership in making positive health changes.
- The application of a new way of living may appear more appealing to a patient who sees his or her provider applying the very same evidence and practice which are implored to be adhered to.

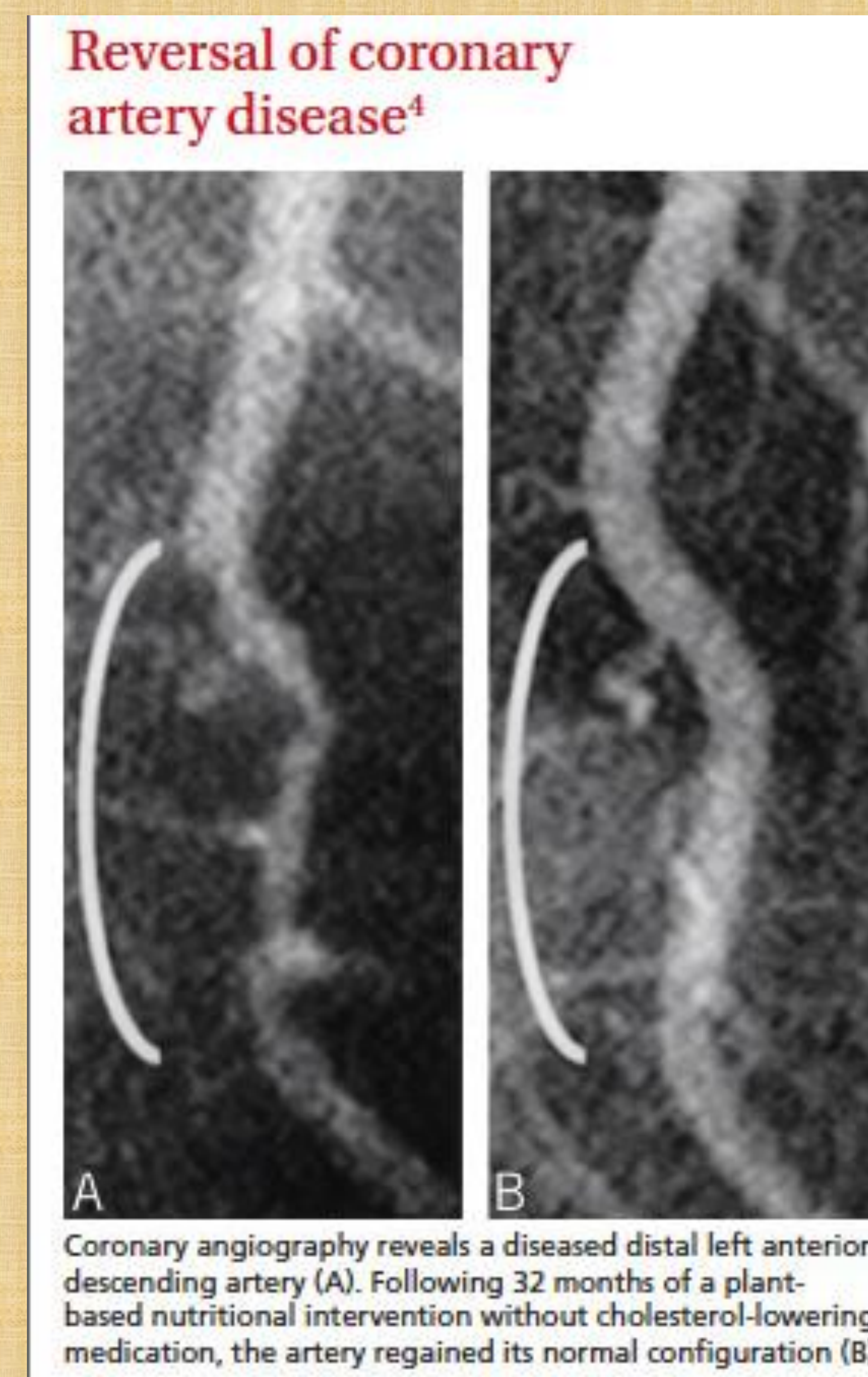
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## Statement of the Problem

- A person's diet serves as the most malleable factor toward health and wellness.
- Society is fixated on drifting from fad to fad that either worships or demonizes a particular food group or nutrient, however a subtle supporting actor is the notion that fruits and vegetables should be included, to some extent, as part of a healthy diet.
- Is there truly something to be gained from adhering to a countercultural plant-based diet as a means of preventing cardiovascular and many other disease processes?



## Acknowledgements

- Jay Metzger for serving as both faculty advisor and mentor for the vision of this project
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