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May 4th, 12:00 AM

Is There a Role for Plant-Based “Meat” in Cardiovascular Disease Prevention?

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Jadallah, Aziza; Al-Shehab, Usmaan; and Friedman, Adam, "Is There a Role for Plant-Based “Meat” in Cardiovascular Disease Prevention?" (2023). *Stratford Campus Research Day*. 32.
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Is there a role for plant-based “meat” in cardiovascular disease prevention?

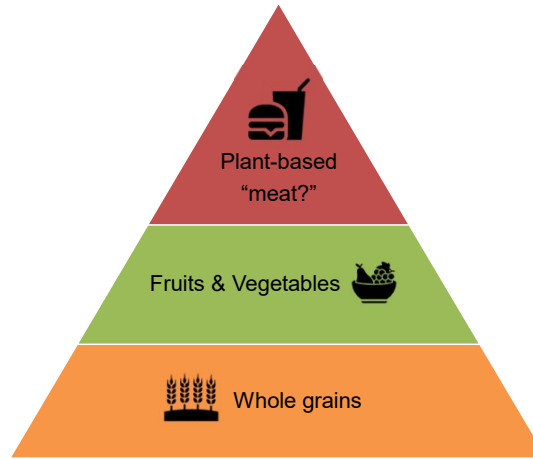
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Research Question

How do processed plant-based diets and plant-based meat affect cardiovascular/metabolic disease outcomes in adults?

Introduction

- Diet is an established risk factor for cardiovascular disease.^{1,2,3}
- The American Heart Association recommends following a whole-food, minimally processed diet emphasizing fruit and vegetables to reduce cardiovascular mortality.⁴
- Recently, processed plant-based meat substitutes, such as Beyond Meat® and Impossible™ foods have become easily accessible to consumers and are advertised as a healthful addition to a plant-based diet. However, these products are highly processed and contain high amounts of saturated fat and sodium.^{5,6}



Methods

- **Search terms:** “processed plant-based stroke”, “Mediterranean diet”, “plant-based diet vs. meat-based diet”, “ultra-processed stroke”, “unhealthful plant-based”, “unhealthful plant-based AND cardiovascular”, “plant-based meat”, “stroke unhealthful plant-based diet”, and “processed plant-based meat cardiovascular.”
- **Databases:** PubMed, Google Scholar, Web of Science
- **Inclusion Criteria:** Randomized controlled trials, prospective cohort studies, retrospective cohort studies, and cross-sectional studies
- **Outcome measures:** were reviewed to assess the effect that a healthful or unhealthful plant-based diet may have on cardiovascular and cardiometabolic disease , as well as long-term health outcomes.
- **Other sources:** Medical textbooks, medical society guidelines, and plant-based meat manufacturer websites were used to provide context to the research question.

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Results

- **Health outcomes are dependent on micronutrient content**
- Plant-based diets with the highest levels of serum beta-carotene and other micronutrients are associated with lower overall cardiovascular disease and mortality, as well as better metabolic markers.^{1,7,8}
- **Plant-based meats reduce TMAO levels and improve cardiovascular disease risk factors**
- Animal-based diets are associated with higher serum levels of trimethylamine N-oxide (TMAO), which is associated with an increased risk of heart attacks, vascular disease, and stroke.^{2,9,10}
- Consumption of plant-based meat alternatives has been shown to reduce TMAO levels by 31.9% while reducing LDL and blood pressure and increasing HDL levels.¹¹
- **Highly processed diets are associated with negative health outcomes, regardless of plant-based content**
- Unhealthful plant-based diets are associated with greater cardiovascular disease risk factors and mortality compared to healthful plant-based diets.^{12,13,14,15,16,17}
- Computer modeling predicts adherence to a minimally processed diet containing animal products will result in lower rates of cardiovascular disease, ischemic heart disease, and diabetes, compared to a moderately processed plant-based diet.¹⁸

Discussion

- **There are many facets to a healthful diet**
- Degree of processing.
- Macronutrient (e.g. saturated fat) and micronutrient profile (vitamins, antioxidants, metabolites).
- **Not all plant-based diets are healthful**
- Plant-based diets containing a moderate amount of processed foods are projected to have worse health outcomes than minimally processed diets containing animal foods.
- **It is unclear where plant-based meats fit into a healthful, plant-based diet**
- Studies have shown plant-based meats improve metabolic markers and reduce TMAO levels.
- However, plant-based meats are highly processed, and processed plant-based diets have worse health outcomes than whole-foods, plant-based diets that contain animal products.

Conclusion

- TMAO, a metabolite of red meat and eggs, is associated with an increased risk of cardiovascular disease and stroke
- Diets containing plant-based meat are associated with lower TMAO levels
- Processed plant-based diets are associated with worse cardiovascular and cardiometabolic outcomes compared to minimally processed diets containing animal products
- **While plant-based meats may reduce TMAO levels and other cardiovascular disease risk markers, they are still part of a processed diet. Overall, processed diets, including processed plant-based diets, are associated with worse cardiovascular, metabolic, and mortality outcomes compared to minimally processed, whole-food diets.**