



## PHYSICIAN FACTSHEET: Heart Disease & Diet

How to prevent and treat heart disease with nutrition

Ischemic heart disease is the leading cause of death globally, accounting for nine million deaths annually.

Diet and diet-related conditions, such as obesity, type 2 diabetes, and hypertension are the most significant risk factors for the development of heart disease.

All international guidelines recommend dietary modifications, which reduce the risk of incident heart disease and recurrent cardiovascular disease (CVD) events.

An optimal heart disease-prevention diet is rich in whole plant foods such as whole grains, fruits, vegetables, legumes, and nuts, and low in sodium, processed, and animal foods.

**"Heart disease is the leading cause of death globally".**

(World Health Organization)

### Pathomechanisms Influenced by Diet

#### Endothelial dysfunction and atherosclerosis

##### Cholesterol

- Increased LDL cholesterol is the key driver for atherosclerosis
- Saturated fats, trans fats, and dietary cholesterol increase concentrations of blood lipids and cause dyslipidemia, including increased LDL
- HDL cholesterol has various endothelial-protective effects (2)

##### Fatty acids

- Omega-3, monounsaturated and polyunsaturated fatty acids (MUFA and PUFA) improve endothelial function, augment endothelial relaxation, prevent inflammation, and lower cardiovascular risk (3)
- Omega-6, saturated and trans fatty acids impair endothelial function (4)

#### Dietary Interactions

##### Antioxidants

Exogenous antioxidants contained in many vegetables, fruits and other plant-based food:

- Help reduce oxidative stress
- Protect LDL molecules against oxidation, preserve endothelial-dependent vasodilation, and limit the formation of atherosclerosis (5)

##### Carbohydrates

- Complex carbohydrates such as soluble fibre from fruits and vegetables are associated with reduced atherosclerotic progression and lower CVD risk
- Simple carbohydrates are associated with a higher risk for CVD (6)

##### Trimethylamine N-oxide (TMAO)

- Gut microbe-dependent metabolic by-products from carnitine and choline
- TMAO activates immune and inflammatory responses, alters cholesterol metabolism and promotes atherosclerotic thrombosis (7,8)



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### The Scientific Evidence

#### Epidemiological evidence

- **28% risk reduction** for CHD incidence in prospective studies comparing the highest diet adherence to a Mediterranean diet with the lowest category (9)
- **25% risk reduction** for CHD incidence in prospective studies comparing the highest diet adherence to a healthy plant food diet with the lowest category (10)

Healthy plant food diet: rich in whole grains, fruits/vegetables, nuts/legumes, oils, tea/coffee and low in juices/sweetened beverages, refined grains, potatoes/fries, sweets, and animal foods

- **32% lower risk** of CHD development in vegetarians compared to non-vegetarians from the EPIC-Oxford study (11)
- **38% risk reduction** for myocardial infarction in prospective studies comparing the highest diet adherence to a Mediterranean diet with the lowest category (9)

#### Evidence from RCTs and meta-analyses

- **28-31% risk reduction** for major cardiovascular events when following a Mediterranean diet supplemented with nuts or extra virgin olive oil compared to a fat-reduced diet (12)
- **72% risk reduction** for cardiac death and myocardial infarction when following a Mediterranean diet compared to a Western diet (13)
- **9 mg/dL (0.23 mmol/L) less LDL cholesterol** in vegans versus omnivores (14)
- **Significant risk reduction** of CVD through higher intake of flavonoids (15)
- **Significant positive dose-dependent association** between plasma TMAO levels, cardiovascular events, and mortality (16)

### General Recommendations

**Maximize the intake of high-quality plant foods** such as vegetables, whole grains, legumes, fruits, nuts, seeds, herbs, and spices; your health will benefit from every step towards more whole plant foods.

**Eliminate or limit all processed foods**, refined carbohydrates, and sugar-sweetened foods and beverages.

**Eliminate red and processed meat products** such as burgers, sausages, bacon, ham, salami, dried meat, canned meat, and pastrami (17).

**Eliminate or limit other animal products** such as poultry, fish, eggs, cheese, and dairy.

Make sure to **cover potentially critical nutrients** with a wide variety of plant foods, enriched foods/drinks, or supplements (especially vitamin B12 and vitamin D).



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### Disease Specific Recommendations

**Limit sodium intake to <2gm per day (5gm table salt).** Avoid processed foods (which are often high in salt), and experiment with different spices and herbs to give flavour to your food while reducing the amount of salt.

Choose healthy, whole-food fat sources such as **nuts, seeds, or avocados**. When oil is needed, choose **omega-3-rich** oils (such as flaxseed, hemp, canola, and nut oils) over omega-6-rich oils (such as sunflower, safflower, and corn oil); avoid saturated fats (such as animal fats, coconut oil, and processed foods).

Always go for **whole-grain** foods to increase your fibre intake. The fibre in whole grain bread, pasta, quinoa, oatmeal, and brown and wild rice lowers cholesterol and blood pressure.

Fight chronic inflammation –a crucial puzzle piece in the development of heart disease– with powerful **antioxidants** in berries, cruciferous vegetables (like broccoli), dark green leafy vegetables, and beans.

Regularly include some of the following foods as they are proven to be especially effective against hypertension, a leading risk factor for heart disease: beetroots (beetroot juice), leafy green vegetables (broccoli, kale, brussels sprouts, bok choy, etc.), garlic, oats, green tea, hibiscus tea, and dark chocolate.

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