



The Modified Mediterranean Diet / Cardio-metabolic Food Plan

The Modified Mediterranean Approach:

The traditional Mediterranean diet first attracted interest when it became apparent that people living on the Greek island of Crete had a greatly reduced risk of cardiovascular disease. Since then, it has become perhaps the most well-known, well-studied diet for CVD, metabolic syndrome, and type 2 diabetes.

People in these countries traditionally tended to eat a similar diet of whole, unprocessed foods:

- Fruits and vegetables (usually seasonal and organic),
- Whole grains, nuts and legumes,
- Unprocessed dairy,
- Extra virgin olive oil,
- Herbs and spices,
- Modest amounts of poultry, fish and red meat,
- Red wine.

It is the combination of all these foods, rather than the consumption of one of these foods in isolation, that is responsible for the cardiovascular and metabolic benefits of this way of eating.

A review of 50 studies on the Mediterranean diet reported that this way of eating favourably changes parameters of metabolic syndrome including waist circumference, cholesterol, blood pressure, and blood sugars.

Balancing Blood Sugar:

A balanced meal should provide at least four hours of energy before you feel the need to eat again. It should result in a feeling of satisfaction and clear-headedness. The experience of hunger within an hour or so of eating, or the feeling of “brain fog,” or fatigue is a signal that the meal was missing something (most likely quality protein, fat, or sufficient whole-food carbohydrates to keep the blood sugar levels balanced). Low blood-sugar symptoms may be a response to eating larger portions of high-carbohydrate foods, but may also indicate food intolerances, food sensitivities, or underlying digestive problems.

A healthy diet is key to blood sugar management and preventing or treating type 2 diabetes. It's not that you must avoid consuming all carbohydrates - but they need to be balanced with protein or fat and fibre. Eating a healthy source of protein, fibre and healthy fat with all of your meals can help stabilise your blood sugar - especially if you consume starchy vegetables like potatoes, fruit or whole grains. Protein and fat slow down the absorption of sugar/ carbohydrate into the bloodstream, help to manage appetite and are also good for your metabolism and digestion.

Raised blood sugar causes inflammation

Stable blood sugar reduces inflammation and helps to balance hormones

Features of the Plan:

Low in Simple Sugars and avoids artificial sweeteners:

Eating refined grains and foods with refined sugar has been positively associated with several CVD risk factors, including elevated blood fats and decreased insulin sensitivity. It is essential to refrain from added sweeteners as much as possible when following this food plan. High-intensity sweeteners can lead to blood sugar imbalances, subsequent weight gain, and continued cravings.

Natural Sugars include: Brown / white cane sugar, agave nectar, sucrose, fructose, glucose, brown rice / corn syrup, maple syrup, honey, barley malt, date or coconut sugar.



Artificial sweeteners include: Xylitol, Erythritol, NutraSweet, Splenda, aspartame, stevia.

When it comes to satisfying a sweet tooth, one of the best things to do is to stay close to nature by eating low-GI fruits like apples and berries. Small quantities of stevia or Xylitol / erythritol can be used in place of sugar for baking on special occasions.

Balanced Quality Fats:

Fats have had a lot of bad press when it comes to heart disease, and in past decades the popularity of fat-free foods grew exponentially. Unfortunately, what replaced much of the fat in processed products was refined sugar. This turned out to be a terrible mistake, since added sugar increases blood fats more than dietary fat does.

Instead, replacing saturated fats with unsaturated (liquid fats) can lead to an overall improvement in cardiovascular health. Although saturated fats have long been referred to as “unhealthy fats,” (especially when it comes to CVD), not all saturated fats are equal with respect to their effects on the body. Select saturated fats like butter (when dairy is tolerated) and coconut oil have been included on this food plan.

Despite all the confusion about fats, the message for someone with cardio-metabolic issues is simple:

- Increase intake of high-quality oils and fats in the diet: Oily fish, nuts and seeds, olive oil, and avocado.
- Minimize those that are associated with disease: Corn oil, soybean oil, heated seed and vegetable oils.

It is advised to refrain from eating trans fats, which are typically found in highly-processed snack foods like potato chips and baked goods. Keep oils in dark glass containers and throw them out if they smell rancid.

Fibre:

The average individual eating a ‘Western-style diet’ with processed foods gets about one-third of the fibre they need each day. Fibre is found in plant-based foods like whole grains, nuts, legumes, vegetables, and fruits. It is a form of carbohydrate that the body is unable to digest, giving the sensation of fullness without many calories. There are two types of dietary fibre—insoluble and soluble—and they have somewhat different benefits:

- **Insoluble fibre** can be found in the bran (outer coat) of vegetables and whole grains. This type of fibre acts like a bulky “inner broom,” sweeping out debris from the intestine and creating more motility and movement.
- **Soluble fibre** attracts water and swells, creating a gel-like mass. The soluble fibre in foods like oat bran, barley, nuts, seeds, beans, lentils, peas, and some fruits and vegetables acts to slow digestion. In addition, it slows the release of glucose from food into the blood (thus warding off the spikes in blood sugar levels) and traps toxins in the gut. Fibre also provides “food” for healthy bacteria in the digestive tract.

Condition-Specific Phytonutrients:

Plant foods contain thousands of compounds that affect body function. The average person eats only a small amount of such phytonutrients every day: less than a teaspoon, which is a tiny amount compared with the many grams of protein, carbohydrate, and fat typically eaten. Yet even this has dramatic effects in the body.

Here are some specific phytonutrients in the food plan and how they can help:

- **In blood sugar regulation:** fenugreek seeds, bitter melon, cinnamon, isoflavones from soy, beta-glucan from oats and mushrooms.
- **In the reduction of LDL-cholesterol oxidation:** Lycopene from tomatoes and red-pink fruit like grapefruit and watermelon, polyphenols from extra-virgin olive oil, green tea, dark chocolate and pomegranate, isoflavones from soy.
- **In the reduction of blood pressure:** Quercetin from red onions and apples, sulphur compounds from garlic and onions, beta-glucans from whole oats, isoflavones from soy, polyphenols from pomegranate and dark chocolate.

Therapeutic Foods:

Fat and Oils

Avocado: Avocados are full of healthy dietary fibre, monounsaturated fats.

Coconut: Coconut oil contains medium-chain triglycerides and have been shown to favourably affect cholesterol.

Olive (extra virgin oil is preferred): Olives make great nutritious snacks and the oil is very versatile for moderate heat cooking, dressings, drizzles and blending into soups to add nutritional value.

Nuts & Seeds:

Great for snacking throughout the day, these can also be sprinkled on top of salads, yoghurt and fruit, or vegetables. Compelling data supports eating a handful of nuts each day to reduce chronic disease risk. They provide anti-inflammatory oils, quality protein, and phytonutrient compounds which support ongoing detoxification. Aim for a mixed blend of raw unsalted nuts (not peanuts) that aren't heavily roasted.

Seeds: Try adding chia seeds or ground flaxseeds to a salad or a smoothie (great for helping constipation).

Nut and seed butters: Tahini drizzled over vegetables and in dressings, almond butter on an apple slice, or cashew nut butter on a sliver of pear.

Peanuts are not included in this section because they are a legume.

Protein:

Unless there are medical restrictions on dietary protein intake, protein should provide about one-third of the daily calories.

Plant-Based: Vegetarians can choose protein from soy (preferably non GM and fermented where tolerated), grains (such as rice and oats), legumes (peas, beans and lentils) as well as nuts and seeds.

Legumes are a perfect way to get quality protein and complex carbohydrates, both of which will help create a feeling of fullness and help keep blood sugar in a healthy range. It is recommended to eat at least 1 serving of legumes each day in the form of soup, cooked beans, dips, or hummus.

Animal Products: Omnivores may add animal proteins such as eggs (high in Omega 3), fish, meat and poultry.

Choosing low Mercury fish source Protein: Shellfish are omitted from the Plan as they are often contaminated with high levels of toxic metals like mercury and arsenic. Fish associated with the highest mercury content include marlin, sea bass, shark, swordfish, tilefish, and tuna. These should be avoided in favour of wild-caught salmon, and small non predator fish such as sardines, whitebait, anchovies, trout and mackerel.

Therapeutic Foods: Omega-3 rich fish, and fermented soy-based foods and organic, grass-fed animal proteins.

Non-Starchy Vegetables:

This category of foods provides medicinal compounds that can ward off cardio-metabolic disease. Try for a wide variety of vegetables, particularly those that are "new" or unfamiliar, aiming for 8 to 12 servings per day. A serving is ½ cup of cooked vegetable or 1 cup of raw, leafy greens.

The leafy green vegetables in this category are Therapeutic Foods because they help correct cardio-metabolic disease. Many of these foods found in the Mediterranean diet have been shown to help lower blood pressure by relaxing blood vessels, reducing inflammation, and protecting blood vessels by lessening oxidative stress. To make a juice from these vegetables, use a blender that keeps the fibre and particulates rather than just squeezing out the sugary juice.

Therapeutic Foods: All greens such as beetroot greens, spring cabbage, dandelion leaves, kale, mustard cress, turnip greens, chard and spinach, plus garlic, onions, and tomatoes.

Starchy Vegetables:

Depending on recommended calorie intake, consumption of starchy vegetables should be limited to 1 serving per day as they tend to impact blood sugar (they are moderate GI). Only moderate-GI starchy vegetables are on this list.

High-GI vegetables like white potatoes have been left off deliberately, as these foods can cause a spike in blood sugar.

Therapeutic Foods: Beetroot are rich in phytonutrients that are heart healthy

Fruits:

These low- to moderate-GI fruits will hit the spot when you are feeling the need for something sweet. Only 2 servings per day are recommended. It's always better to couple fruit with a little bit of protein or fat to offset a rise in blood sugar.

Therapeutic foods: Blueberries, blackberries, strawberries, pomegranate. These contain important phytonutrients that open blood vessels and help with blood sugar control.

Wholegrains:

Whole grains—those with an intact bran, or outer coat provide an excellent source of fibre and other phytonutrients that assist with cholesterol reduction and blood sugar stability.

Oats contain beta-glucan to help with maintaining low cholesterol and blood sugar.

Although these are important foods for people with CVD and metabolic disease, grains can also be overeaten (particularly in their processed forms). Grains can also be a trigger food for some people with autoimmune disease, therefore it is best to limit intake to 1 to 2 servings per day. For others, to limit carbohydrate intake, it may be advised to omit them entirely from the diet.

Patients with celiac disease or gluten intolerance should refrain from eating gluten-containing grains like barley, rye and non GF oats (frequently cross-contaminated through processing of grains).

Therapeutic Foods for Cardio-metabolic Health

- **Avocado:** An avocado is the perfect food for cardiovascular health as it contains a considerable amount of fibre (about 9 grams in a whole avocado), healthy monounsaturated fat, and potassium (almost 700 mg for a whole avocado).
- **Extra-virgin olive oil (EVOO):** People with heart disease who incorporate more EVOO in their diet demonstrate improvement in the ability of their blood vessels to expand along with a reduction in inflammation. Research indicates that consuming close to 50 grams per day (about 10 teaspoons) did not result in weight gain. Unfiltered or unrefined EVOO is preferable, because it contains more polyphenols and antioxidants that may help prevent CVD and lower blood pressure.
- **Olives:** Olive oil is a medicinal food for those with CVD, and so is the olive fruit itself. Research indicates that there are several protective phenolic compounds in the olive which can prevent CVD by reducing the expression of sticky molecules on the lining of the blood vessels. They also help to prevent the oxidation of cholesterol.
- **Ground flaxseed:** Flaxseeds are one of the richest plant sources of anti-inflammatory omega-3 fats. However, for proper digestion and subsequent absorption of omega-3s, the flaxseeds have to be broken open to create flaxseed meal. Flaxseeds can be easily ground into meal with a small coffee grinder and spooned into smoothies or warm cereal, or baked into healthy muffins. Store ground flaxseed in the freezer after opening the package to keep it from turning rancid.

In addition to containing omega-3 fats, ground flaxseed meal is an excellent source of fibre and the best known food source of lignans which help with the prevention of CVD and insulin resistance. One study showed that 30 grams of ground flaxseed (1 ounce) consumed each day reduced the incidence of metabolic syndrome by 20% after 12 weeks by lowering blood pressure, lowering blood sugar, and reducing belly fat.

- **Nuts:** Mixed nuts (especially walnuts and almonds) contain healthy monounsaturated and polyunsaturated fats together with phytochemicals like plant sterols (plant compounds that block intestinal absorption of cholesterol), polyphenols, antioxidants, and fibre.

When mixed nuts replace sources of saturated fat in the diet at a level of 1 to 2 ounces of nuts daily, they reduce CVD risk by lowering LDL-cholesterol by 2 to 19%. They also help reduce susceptibility of LDL to oxidation, improve blood vessel expansion, and quell inflammation.

- **Quality fermented soy products:** Soy protein and isoflavones (phytoestrogens) have been touted for their potential role in improving risk factors for cardiovascular disease. High-quality, non-GMO soy is recommended on this food plan, and can be obtained by selecting organically grown soy. Soybeans contain polyunsaturated fat, fibre, vitamins, minerals, and isoflavones, all of which make them an ideal food for cardiovascular health.

A review of published studies indicated that eating soy was associated with a significant decrease in blood pressure. In people at risk for cardiovascular events, ingestion of soy isoflavones correlated with improvements in blood vessel expansion and reduced thickness of the carotid artery. It has also been suggested that soy isoflavones help to reduce artery stiffness.

Choose high-quality or fermented soy products, avoid processed soy products like soy meat substitutes, which tend to have other ingredients added that may not be so healthful.

- **Fish:** Research studies support fish consumption for cardiovascular health. Even a modest consumption of 1 to 2 servings each week, especially of higher omega-3 fatty acid containing fish such as wild salmon, reduces a person's risk of coronary death by 36%.

Those who eat 5 or more servings of fish a week are advised to eat a variety of seafood, limiting their intake of high mercury-containing fish. Some fish, such as sardines, contain small proteins that are protective for the heart and can help to reduce blood pressure.

- **Greens:** Beetroot leaves, spring cabbage, dandelion leaves, kale, mustard cress, turnip greens, Swiss chard, lettuce, spinach and other green leafy vegetables are good for just about every person and many health conditions. When it comes to Cardiometabolic disease, they are extra important because they supply a plant source of nitrates, a compound that opens up blood vessels.

It has been estimated that 1 serving of a high-nitrate vegetable, like spinach, results in more nitric oxide production than what is naturally produced in the body in one day. Other foods that are particularly high in dietary nitrate include celery, celeriac, chervil, Chinese cabbage, cress, endive, fennel, kohlrabi, leek, lettuce, parsley, red beetroot, spinach, and rocket. The best lettuce choices are those that are darker green or magenta in colour; rather than the iceberg varieties.

- **Onions:** Onions rank as one of the best sources of anti-inflammatory and antioxidant flavonoids, particularly quercetin. In addition, they contain detoxifying sulphur-containing compounds, which enable the body to excrete toxins more effectively.

Animal studies show that onions may help to reduce both blood clotting and levels of cholesterol and blood fats (triglycerides).

- **Tomato:** One staple of the Mediterranean diet is tomatoes. Tomatoes, especially cooked tomatoes, are excellent sources of lycopene, a free radical-quenching carotenoid. They also contain other heart-protective carotenoids.

Cell studies have shown that the carotenoids in tomatoes prevent the oxidation of LDL-cholesterol and, therefore, help to prevent heart disease. Large human studies have indicated that greater intakes of lycopene in the diet are associated with better cardiovascular health. Those who are sensitive to the nightshade family of plants should avoid eating tomatoes.

- **Fermented foods:** Goat or Sheep milk are preferable (as tolerated), and can be fermented to produce yoghurt or Kefir. Foods that contain live active cultures ("probiotics") help in establishing healthy gut microflora. Some research suggests that the quality of the bacteria in the gut plays a role in inflammation, body composition, and even cholesterol levels in the blood.

Good health starts in the gut, especially when it comes to cardio-metabolic diseases. Sauerkraut, kimchi, water kefir and coconut kefir are all good non-dairy sources of probiotics.

- **Blueberries:** Blueberries are packed with healthy phytonutrients for the heart and blood vessels. Studies show that the flavonoid anthocyanin in blueberries helps to keep blood vessels open and even lower heart attack risk. In a study of more than 90,000 women, greater intakes of this compound were shown to reduce heart attack risk. They have also been shown to help with blood sugar control in those with diabetes.

Blueberries have one of the highest antioxidant levels among all fruits, vegetables, spices, and seasonings common in the western diet. They are low-GI and can be frozen without compromising their nutritional quality. Choose organically-grown berries, as they tend to be higher in phytonutrients compared with their conventionally-grown counterparts.

- **Pomegranate:** While it is advised not to drink fruit juices on this plan due to their high sugar content, there is one exception to the rule: pomegranate juice. Studies indicate that small amounts of pomegranate juice (50 millilitres, or a little over 1.5 ounces) has been shown to help reduce blood lipids, blood pressure, and plaque build-up in arteries.
- **Oats:** Similar to barley, oats contain fibre, phytochemicals, and the beta-glucan compound that helps reduce levels of both cholesterol and blood sugar. What makes oats unique relative to barley is the presence of antioxidant compounds called avenanthramides, which help prevent free radical damage to LDL-cholesterol, thus reducing the risk of CVD. Whole grains such as oats are an excellent source of magnesium, an important mineral in the regulation of glucose and insulin.
- **Cocoa:** This plan allows for the inclusion of dark chocolate (70% cocoa and higher) because of the cocoa polyphenols that appear to be helpful in keeping arteries wide open and protected from harmful free radicals. The healthy way to eat chocolate is to make sure it's somewhat bitter with a higher percentage of cacao and minimal sweeteners (and no milk) added.

Dark chocolate has caffeine, so caffeine-sensitive people should take that into consideration.

- **Green Tea:** Drinking green tea has been shown to be beneficial for reducing blood pressure and blood fats (triglycerides, cholesterol, and LDL-cholesterol) and may even help with lowering blood sugar. While studies vary in the amount and type of green tea used, the general recommendation for green tea consumption is based on the amount typically consumed in Asian countries, which is about 3 cups per day, supplying 240-320 mg of polyphenols.

Frequently Asked Questions:

What are the best sweeteners? As much as possible, refrain from eating any added sweeteners due to the damaging effects that sugar can have on blood vessels and other body organs.

When craving something sweet, choose from the low to moderate-GI fruits listed on the Cardio-metabolic Food Plan. Eating an apple or having a handful of fresh blueberries can help to quell sugar cravings.

This plan does not include artificial sweeteners but Stevia or erythritol may be used in limited amounts for food preparation. Only a small amount is required as it is intensely sweet.

What drinks are allowed? Drink water throughout the day. Drink less water with a meal and more in between meals. Unsweetened herbal teas, such as mint, chamomile, or liquorice, are also good choices as they provide flavour and medicinal compounds.

Green tea helps with blood sugar control. Typical recommendations for herbal or green tea are 1-3 cups per day. Caffeine-sensitive individuals may be advised to drink decaffeinated varieties of green tea.

What about eating eggs? There has been an ongoing debate about eggs, particularly when it comes to heart disease, as originally it appeared that the cholesterol in eggs made blood cholesterol rise. It is now known that this is not so and that people with CVD may eat eggs on a daily basis.

What condiments are acceptable? Many condiments, such as teriyaki sauce, ketchup, barbecue sauce, and glazes, have sugar added. It would be best to avoid them entirely and to make homemade versions that are healthier. Adding more herbs and spices to foods can replace unhealthy condiments.

What about drinking alcohol? The alcohol question always surfaces, especially when talking about the Mediterranean diet, which includes red wine. There are phytonutrients present within red wine, such as resveratrol, that help to relax blood vessels, increase good cholesterol, and bring blood sugar into balance. However, red wine is also a form of sugar and added calories, and may not be good for everyone. A health

practitioner who knows the individual patient's health history can make a determination as to whether moderate or occasional use of alcohol would be appropriate and consistent with health goals.

For a generally healthy man, 1 to 2 glasses (5 ounces or $\frac{2}{3}$ cup) of red wine, depending on body weight may be perfectly acceptable at meals. Women should be advised to have just 1 glass of wine no more than four times a week due to the recognized association between breast cancer and increased alcohol consumption.

What about drinking coffee and tea? The answer to whether or not to drink caffeinated coffee or tea is not so straightforward. In general, studies show that the short-term effects of caffeine include tightening of blood vessels, causing unfavourable changes in blood pressure. Also, caffeine increases cortisol, a stress hormone, so it can make people feel more wired and "on edge." For some, caffeine can cause a speeding heart rate and abnormal heart rhythms.

On the other hand, the phytonutrients in coffee, like chlorogenic acid and caffeic acid, may be helpful in better processing of blood sugar by the liver, thus helping to control the liver's production of sugar. Moderate consumption of up to 3 cups daily has been shown to be associated with lower rates of T2D.

Therefore, every particular situation must be evaluated and discussed with a health practitioner. Patients should be advised not to add cow's milk and sugar. Rather, they should use dairy alternatives such as almond, oat, coconut, and hemp milks.

Green tea may be a better drink for most people. It contains caffeine, but not as much as a typical cup of coffee, it also contains theanine which buffers the effect of the caffeine and it can also be purchased in non-caffeinated varieties.

Green tea contains phytonutrients that are anti-inflammatory and antioxidant, helping to assist with blood sugar balance, blood lipids, and the expansion of the blood vessels. Drinking both green and black teas has been associated with reduction in the risk of heart disease and stroke by 10% to 20%. Three cups per day appears to provide the most benefit in blood pressure lowering and reducing CVD risk overall.

Why is coconut oil on this plan? Isn't it bad for the heart? Extra-virgin olive oil should be the staple oil for salad dressings, but unrefined coconut oil can also be used for cooking. Research indicates that coconut oil may have some merit as it provides short- and medium-chain fats that can be quickly oxidized for energy. Too much coconut oil that is of low quality, however, is not healthy.

Resources:

We recommend you purchase a recipe book to help with ideas for healthy meal planning:

Dr Aseem Malhotra

- [The Pioppi Diet](#)

Barbara Cousins

- ['Easy Tasty Healthy'](#) (All recipes free from gluten, dairy, sugar, soya, eggs and yeast)

Amelia Freer

- ['Eat Nourish Glow'](#)

From the Hemsley sisters Jasmine and Melissa Hemsley

- ['The Art of Eating Well'](#)
- ['Good + Simple'](#)

From the Leon Kitchen by Jane Baxter and John Vincent

- ['Leon Fast & Free: Free-from recipes for people who really like food'](#)

Vegan Cookbook from Saskia Gregson Williams

- ['Naturally Sassy'](#)