CARDIOMETABOLIC FOOD PLAN

Comprehensive Guide

IFM®

Version 12

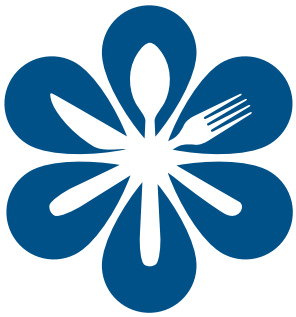


Table of Contents

Why the Cardiometabolic Food Plan? 3

Features of the Cardiometabolic Food Plan 4

Touring Through the Food Plan 11

Therapeutic Foods for Cardiometabolic Health 14

Condition-Specific Therapeutic Considerations 20

Frequently Asked Questions 22

Resources and Tools for Success .. 24

© 2020 The Institute for Functional Medicine

Why the Cardiometabolic Food Plan?

The Cardiometabolic Food Plan is designed for the following individuals:

- **Those with risk factors for cardiovascular disease (CVD)**
- **Those with risk factors for conditions such as metabolic syndrome, type 2 diabetes (T2D), or both**
- **Those with CVD (e.g., high blood pressure, high cholesterol, and elevated blood fats)**
- **Those with metabolic syndrome (e.g., high blood sugar, increased belly fat)**
- **Those with T2D**

Fortunately, diet and lifestyle interventions are effective in preventing and treating all of these conditions. This Comprehensive Guide explains what makes this food plan unique for the individual. It also provides answers to common questions people may have as they start to follow the plan.

Some people may question why the same food plan is suggested to treat both cardiovascular and metabolic diseases. While they may seem to be different types of conditions, cardiovascular and metabolic dysfunctions share similar causes, including inflammation, insulin resistance, and stress. This food plan is called "cardiometabolic" because it addresses both disease states. It allows people to use food medicinally to treat the common underlying causes.

© 2020 The Institute for Functional Medicine

Features of the Cardiometabolic Food Plan

This food plan was constructed with the input of a team of physicians and nutrition professionals to enhance therapeutic effects from eating. Recent evidence from scientific studies is also built into the foundations of the plan.

- **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 CVD. Since then, it has become perhaps the most well-known, well-studied diet for CVD, metabolic syndrome, and T2D. While the Mediterranean region comprises 16 different countries, people in these countries tend to eat a similar diet: whole, unprocessed foods such as fruits, vegetables, whole grains, nuts, legumes, dairy, extra virgin olive oil, spices, modest amounts of poultry, fish and red meat, and 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 favorably changes parameters of metabolic syndrome such as waist circumference, high-density lipoprotein cholesterol, triglycerides, systolic and diastolic blood pressure, and glucose.

Those who enjoy the cuisine of their own ethnic backgrounds (e.g., Hispanic, Indian, Chinese, or others) can still choose to include foods from the Mediterranean diet in their preferred style of eating. In this Guide, there is a list of "Therapeutic Foods" that will facilitate such inclusion. For example, people can choose to use extra virgin olive oil in cooking rather than corn or soybean oils, or incorporate tomatoes or a broader array of spices into their native cuisine for maximum impact. The key is to select whole, fresh, unprocessed foods rather than to buy pre-packaged foods that have been manufactured to be convenient. This is truly one of the most important takeaways of the Mediterranean diet!

© 2020 The Institute for Functional Medicine

- **Low Glycemic Impact:** Not all foods have the same impact on blood sugar and insulin. Ideally, blood sugar should remain relatively constant, without huge spikes that cause insulin to surge in order to shuttle sugar into tissues that need it, like muscles and the liver. A rollercoaster of glucose and insulin levels throughout the day is not healthy in the long term, especially for those with cardiovascular, metabolic, or diabetic concerns. In fact, high blood sugar levels sustained over time can damage the blood vessels, blood cells, and other parts of the body that are sensitive to high sugar like the eyes and kidneys. Therefore, regulating sugar levels by eating foods that do not spike blood sugar is preferred on this food plan.

There are two ways to assess the impact of food on blood sugar. The first is the **glycemic index** (GI), and the other is the **glycemic load** (GL). GI is a way to measure the impact of a food on blood glucose levels. The index ranks carbohydrate-containing foods on a scale of 0 to 100 based on how quickly the foods raise blood sugar levels. Glucose (sugar) is calibrated to 100 as the highest GI value, because it has the strongest effect on blood sugar.

The goal of the Cardiometabolic Food Plan is to eat low-GI foods (foods scoring 55 or lower on the GI) so that only small fluctuations in blood glucose and insulin levels are produced. Examples of low-GI foods include legumes (e.g., soy, kidney beans, lentils, chickpeas), nuts (e.g., almonds, walnuts), seeds (e.g., pumpkin, flax, sesame), most intact grains (e.g., oat, barley, spelt), and most vegetables and fruits (e.g., peaches, berries).

While low-GI foods are the best choices, most people will eat some medium-GI foods (56-69) periodically. One tip to remember is that medium- and high-GI foods should be eaten with protein or fat, both of which blunt the glycemic effect of these foods. This reduces the overall glycemic impact of a meal. Examples of medium-GI foods include raisins, most whole-grain breads and grain products, brown or white basmati rice, and bananas, to name a few. Most starchy vegetables like potatoes are also medium-GI foods.

Foods containing refined sugars, artificial sweeteners, and refined grains are considered to be high-GI, because they lead to sharp increases in blood sugar levels. Examples include cakes, cookies, pies, white bread, and other processed foods.

It is important to recognize that the GI refers to the increase in blood sugar for a defined portion of all foods. It does not necessarily take into account the portion of these foods eaten in a typical setting. For example, watermelon is considered to be high-GI, but the average person eats relatively little at a time; therefore, the actual glycemic impact of watermelon may not be all that significant.

Since we all eat a combination of foods with differing GI levels, we also use the concept of GL to capture a more comprehensive picture of the glycemic impact of the diet as a whole. GL takes into account appropriate portions of food and is thus a more realistic measure of glycemic effect.

GL is calculated by multiplying a food's GI (as a percentage) by the number of net

© 2020 The Institute for Functional Medicine

carbohydrates (total carbohydrates minus fiber) in a given serving. The result is a relative indication of how much that serving of food is likely to increase blood sugar levels.

Eating appropriate portions of foods low in both GI and GL helps to stabilize blood sugar throughout the day. When blood sugar is stabilized, people experience less hunger and cravings and have better health results overall, whether there are cardiovascular concerns, metabolic dysfunctions, or blood sugar imbalances.

Low-GL foods have a value of 10 or less. These foods release glucose more slowly than medium- and high-GL foods. In return, the body is able to maintain a more stable energy level for a longer period of time. Meanwhile, medium GL-foods have a value of 11 to 19, and high-GL foods have a value of 20 and above. In general, processed foods have a higher GL than fresh whole foods.

Many vegetables and fruits are low-GL, including broccoli, cabbage, cauliflower, celery, green beans, mushrooms, spinach, kiwi, papaya, and watermelon. The most beneficial whole grains that are both low-GI and low- or medium-GL include steel-cut oats, rolled oats, bulgur, and barley. Whole-grain rye bread and crackers with seeds and oats are both low-GI and low-GL. Other grains and breads are all medium-GI and medium-GL. The Cardiometabolic Food Plan provides a list of allowable foods that are low- or medium-GI or GL.

- **Targeted Calories:** A qualified health practitioner may recommend a particular calorie amount. This calorie need is determined by many factors, including current body weight, basal metabolic rate, activity level, and cardiometabolic risk factor status. A targeted calorie plan that specifies individual food groups and servings can help people lose weight and achieve cardiometabolic balance. Many patients prefer more dietary structure to their daily eating to give them guidance and help them achieve balance in their eating choices. It is best to work together with a practitioner to determine what is most suitable for one's own schedule, bodily needs, and health goals.

- **Balances Blood Sugar:** The average meal should provide at least four hours of energy before the person feels the need to eat again. Following a meal, one should take note of the energy level over the next several hours. A balanced meal will result in a feeling of satisfaction, clear-headedness, the ability to focus, and sufficient energy. If the person experiences hunger within an hour or so of eating or reports feeling "brain fog," shaky, or fatigued, it may be that the meal was missing something, most likely quality protein, fat, or enough whole-food carbohydrates to keep the blood sugar levels balanced. These low blood-sugar symptoms may be a response to eating larger portions of high-GL foods. However, symptoms may also indicate food intolerances, food sensitivities, or underlying digestive problems. If symptoms continue to persist after following the suggestions in this Comprehensive Guide (and the accompanying handouts from a healthcare practitioner), then the next step should be to assess for the presence of food intolerances and/or digestive dysfunction.

© 2020 The Institute for Functional Medicine

- **High in Fiber:** Along with the low GI and GL features of this plan, eating whole, relatively unprocessed foods also helps the patient take in more dietary fiber and less added sugar. Unfortunately, the average individual living in a Western country and eating a diet of processed foods gets about one-third of the fiber they need each day. Fiber 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 fiber—insoluble and soluble—and they have somewhat different benefits. Insoluble fiber can be found in the bran (outer coat) of vegetables and whole grains. This type of fiber acts like a bulky "inner broom," sweeping out debris from the intestine and creating more motility and movement. Soluble fiber attracts water and swells, creating a gel-like mass. The soluble fiber in foods like oat bran, barley, nuts, seeds, beans, lentils, peas, and some fruits and vegetables acts to slow digestion. (Psyllium, the main ingredient of common fiber supplements, is a soluble fiber.) In addition to slowing the release of glucose from food into the blood (thus warding off the spikes in blood sugar levels that need to be prevented in cardiometabolic diseases), soluble fiber also traps toxins and other undesirables (including cholesterol and other dietary fats) in the gut, helping to carry them to excretion, while also providing "food" for healthy bacteria in the digestive tract. With greater fiber in the diet, a cholesterol-lowering effect may be experienced. Overall, eating more fiber has several benefits, so it is recommended to aim for at least 5 grams of fiber per serving of a food, or a total of 25–35 grams fiber per day.

- **Low in Simple Sugars:** Another feature of the Cardiometabolic Food Plan is the reduction or absence of added sugars. Added sugars contribute a significant portion of calories to the American diet (e.g., sugar-sweetened beverages). Eating refined grains and foods with refined sugar has been positively associated with several CVD risk factors, including elevated blood fats (triglycerides), low good cholesterol (HDL-C), and decreased insulin sensitivity. Refined sugars are prevalent in sodas, fruit drinks, presweetened tea, coffee drinks, energy or sports drinks, and flavored milks.

  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, increased calories and subsequent weight gain, and continued cravings. Half of the battle against sweeteners can be won by reading food labels. Here is an extensive list of natural and artificial sweeteners that may be found on food labels:

© 2020 The Institute for Functional Medicine

Agave nectar, sucrose, fructose, glucose, brown rice syrup, maltitol, mannitol, corn syrup, corn syrup solids, xylitol, sorbitol, fructose, dextrose, evaporated cane juice, erythritol, NutraSweet, Splenda, aspartame, brown sugar, Demerara sugar, stevia, invert sugar, maltodextrin, maltose, maple syrup, confectioner's sugar, turbinado sugar, fruit juice concentrate, honey, barley malt, cane sugar, date sugar, caramel.

When it comes to satisfying a sweet tooth, one of the best things to do on this plan is to stay close to nature by eating low-GI fruits like apples and unsweetened applesauce, and using apple juice concentrate for cooking and baking. The least desirable option is to use white table sugar and other processed forms of sweeteners. Artificial (synthetic) sweeteners should be completely avoided as these high-intensity sweeteners may have negative effects on metabolism and could spur food cravings. Artificial sweeteners that should be avoided include aspartame (NutraSweet®), sucralose (Splenda®), acesulfame-K (Ace K, Sweet One, Sunett), and saccharin (Sweet N' Low®).

- **Balanced Quality Fats:** Dietary fats have had a bad reputation when it comes to heart disease. In the 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! Much of the research on the health benefits of dietary fats has found that what replaces dietary fat matters a great deal. For example, when saturated fat is replaced with refined carbohydrates, cardiovascular outcomes are not good. 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 grass-fed butter and coconut oil have been included on this food plan, as they are acceptable in small amounts.

Despite all the confusion about dietary fats, the message for someone with cardiometabolic issues is simple: emphasize high-quality oils and fats in the diet and minimize those that are associated with disease.

© 2020 The Institute for Functional Medicine

Eating too much saturated fat (e.g., animal fat, lard) and omega-6 fat (e.g., corn oil, soybean oil) can have "inflammatory" effects. These effects can be offset by adding "anti-inflammatory" fats to the diet. The anti-inflammatory fats typically have a higher concentration of omega-3 fats to omega-6 fats, and include foods like fish, leafy greens, nuts, certain oils, and seeds. Organizations like the American Heart Association have recognized the health benefit of these anti-inflammatory oils and encourage individuals to include more omega-3 sources in the diet. For those with specific health concerns such as high blood fats (triglycerides), supplementation with fish oil, an excellent source of omega-3 fats, may be recommended to help bring blood fats into a normal range.

- **Condition-Specific Phytonutrients:** Plant foods contain thousands of compounds that affect body function. While 5,000 to 10,000 of these compounds have been identified, it has been suggested that many more remain unknown. 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. Several of them, such as the bitter compounds in arugula and other green leafy vegetables, the resveratrol in grapes and red wine, and the astringent compounds in green tea appear to work favorably on pathways within the cell to create cardiometabolic balance. Certain phytonutrients can intervene to help with blood sugar regulation, lower LDL-cholesterol, and even help to get blood pressure back into a healthier range.

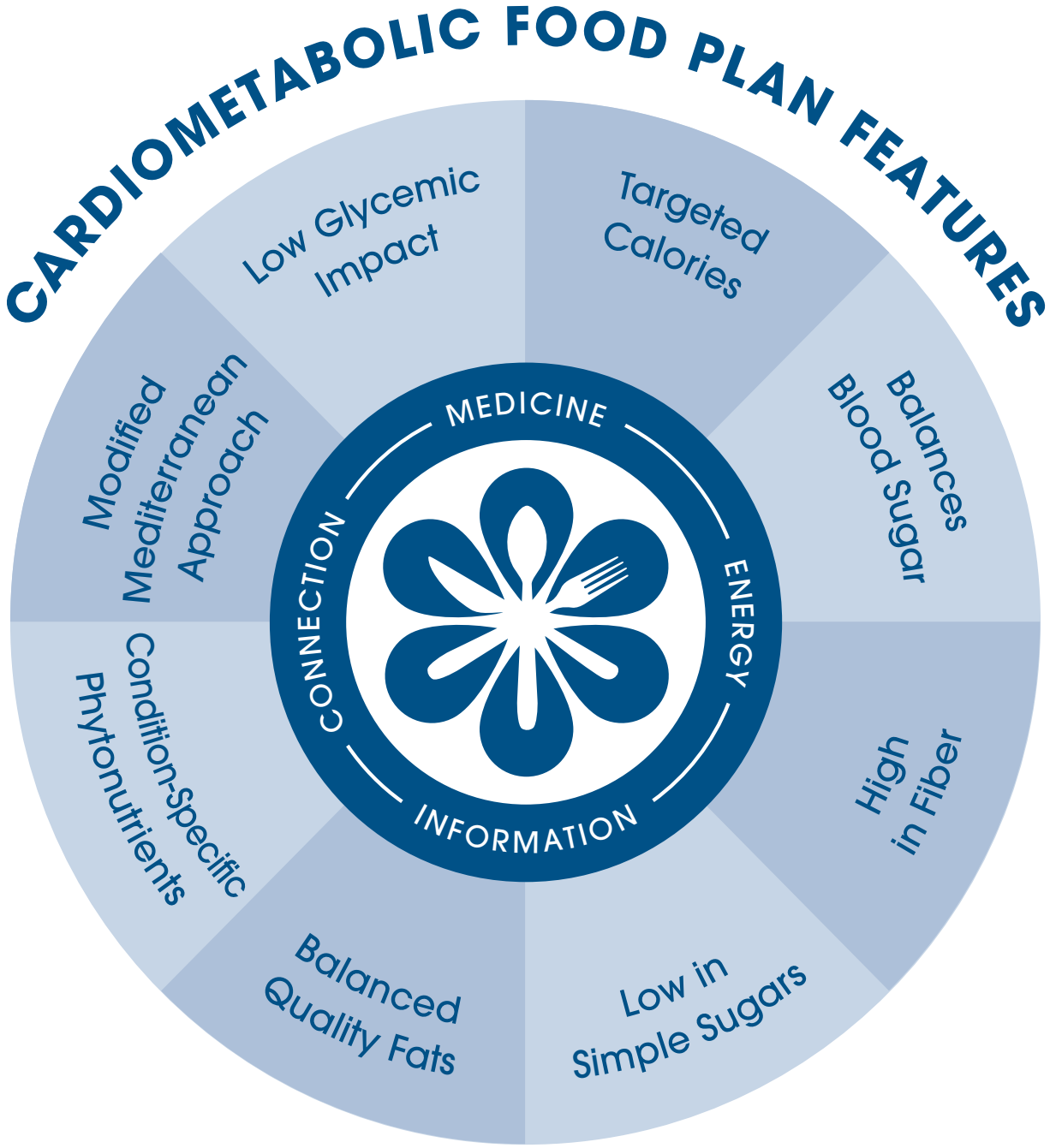
Here are some specific phytonutrients in the food plan and how they can help:

Phytonutrients that assist in blood sugar regulation: 4-hydroxyisoleucine in fenugreek seeds, charantin from bitter melon, cinnamaldehyde in cinnamon, isoflavones from soybeans, beta-glucan from oats and barley

Phytonutrients that assist in the reduction of LDL-cholesterol oxidation: Carotenoids including lycopene from tomatoes and red-pink fruit like grapefruit and watermelon, polyphenols like hydroxytyrosol from extra-virgin olive oil, polyphenols from green tea, isoflavones from soybeans, polyphenols from dark chocolate and pomegranate

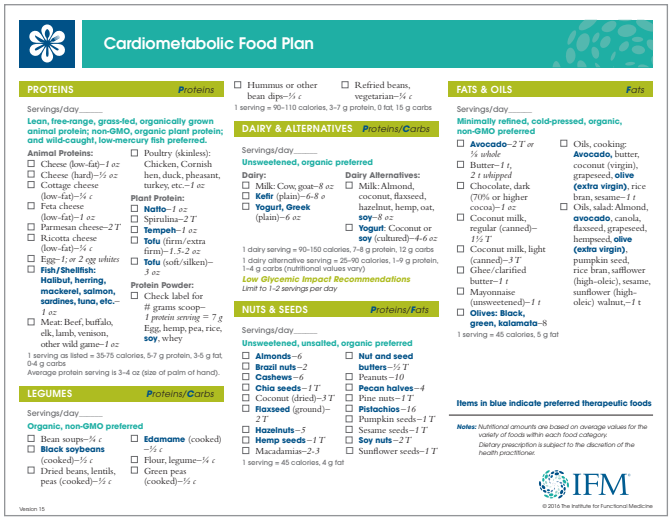
Phytonutrients that assist in the reduction of blood pressure: Quercetin from onions, sulfur compounds from garlic, beta-glucan from whole oats, isoflavones from soybeans, polyphenols from pomegranate juice, polyphenols from dark chocolate

© 2020 The Institute for Functional Medicine



© 2020 The Institute for Functional Medicine

The Cardiometabolic Food Plan is designed to give a snapshot of the foods that people should choose from every day. A health practitioner may provide a set calorie amount and a specific number of selections within the food categories. A general description of the food categories below provides a foundation for any calorie-specific plans. Several foods in each category are highlighted as "Therapeutic Foods"; the next section explains why they are preferable options.



Cardiometabolic Food Plan

PROTEINS — Proteins

Servings/day_____

Lean, free-range, grass-fed, organically grown animal protein; non-GMO, organic plant protein; and wild-caught, low-mercury fish preferred.

Animal Proteins:
- Cheese (low-fat)–1 oz
- Cheese (hard)–½ oz
- Cottage cheese (low-fat)–¼ c
- Feta cheese (low-fat)–1 oz
- Parmesan cheese–2 T
- Ricotta cheese (low-fat)–¼ c
- Egg–1; or 2 egg whites
- Fish/Shellfish: Halibut, herring, mackerel, salmon, sardines, tuna, etc.–1 oz
- Meat: Beef, buffalo, elk, lamb, venison, other wild game–1 oz
- Poultry (skinless): Chicken, Cornish hen, duck, pheasant, turkey, etc.–1 oz

Plant Protein:
- Natto–1 oz
- Spirulina–2 T
- Tempeh–1 oz
- Tofu (firm/extra firm)–1.5–2 oz
- Tofu (soft/silken)–3 oz

Protein Powder:
- Check label for # grams scoop–1 protein serving = 7 g
  Egg, hemp, pea, rice, soy, whey

1 serving as listed = 35-75 calories, 5-7 g protein, 3-5 g fat, 0-4 g carbs
Average protein serving is 3–4 oz (size of palm of hand).

LEGUMES — Proteins/Carbs

Servings/day_____

Organic, non-GMO preferred
- Bean soups–¾ c
- Black soybeans (cooked)–½ c
- Dried beans, lentils, peas (cooked)–½ c
- Edamame (cooked)–½ c
- Flour, legume–¼ c
- Green peas (cooked)–½ c
- Hummus or other bean dips–½ c
- Refried beans, vegetarian–½ c

1 serving = 90–110 calories, 3–7 g protein, 0 fat, 15 g carbs

DAIRY & ALTERNATIVES — Proteins/Carbs

Servings/day_____

Unsweetened, organic preferred

Dairy:
- Milk: Cow, goat–8 oz
- Kefir (plain)–6–8 o
- Yogurt, Greek (plain)–6 oz

Dairy Alternatives:
- Milk: Almond, coconut, flaxseed, hazelnut, hemp, oat, soy–8 oz
- Yogurt: Coconut or soy (cultured)–4–6 oz

1 dairy serving = 90–150 calories, 7–8 g protein, 12 g carbs
1 dairy alternative serving = 25–90 calories, 1–9 g protein, 1–4 g carbs (nutritional values vary)

Low Glycemic Impact Recommendations
Limit to 1–2 servings per day

NUTS & SEEDS — Proteins/Fats

Servings/day_____

Unsweetened, unsalted, organic preferred
- Almonds–6
- Brazil nuts–2
- Cashews–6
- Chia seeds–1 T
- Coconut (dried)–3 T
- Flaxseed (ground)–2 T
- Hazelnuts–5
- Hemp seeds–1 T
- Macadamias–2-3
- Nut and seed butters–½ T
- Peanuts–10
- Pecan halves–4
- Pine nuts–1 T
- Pistachios–16
- Pumpkin seeds–1 T
- Sesame seeds–1 T
- Soy nuts–2 T
- Sunflower seeds–1 T

1 serving = 45 calories, 4 g fat

FATS & OILS — Fats

Servings/day_____

Minimally refined, cold-pressed, organic, non-GMO preferred
- Avocado–2 T or ⅛ whole
- Butter–1 t, 2 t whipped
- Chocolate, dark (70% or higher cocoa)–1 oz
- Coconut milk, regular (canned)–1½ T
- Coconut milk, light (canned)–3 T
- Ghee/clarified butter–1 t
- Mayonnaise (unsweetened)–1 t
- Olives: Black, green, kalamata–8
- Oils, cooking: Avocado, butter, coconut (virgin), grapeseed, olive (extra virgin), rice bran, sesame–1 t
- Oils, salad: Almond, avocado, canola, flaxseed, grapeseed, hempseed, olive (extra virgin), pumpkin seed, rice bran, safflower (high-oleic), sesame, sunflower (high-oleic) walnut,–1 t

1 serving = 45 calories, 5 g fat

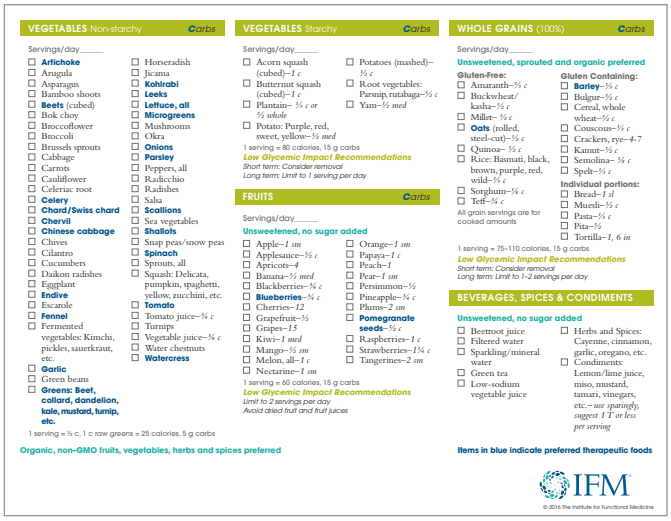
Items in blue indicate preferred therapeutic foods

Notes: Nutritional amounts are based on average values for the variety of foods within each food category.
Dietary prescription is subject to the discretion of the health practitioner.

IFM

Version 15

© 2016 The Institute for Functional Medicine



VEGETABLES Non-starchy — Carbs

Servings/day_____
- Artichoke
- Arugula
- Asparagus
- Bamboo shoots
- Beets (cubed)
- Bok choy
- Broccoflower
- Broccoli
- Brussels sprouts
- Cabbage
- Carrots
- Cauliflower
- Celeriac root
- Celery
- Chard/Swiss chard
- Chervil
- Chinese cabbage
- Chives
- Cilantro
- Cucumbers
- Daikon radishes
- Eggplant
- Endive
- Escarole
- Fennel
- Fermented vegetables: Kimchi, pickles, sauerkraut, etc.
- Garlic
- Green beans
- Greens: Beet, collard, dandelion, kale, mustard, turnip, etc.
- Horseradish
- Jicama
- Kohlrabi
- Leeks
- Lettuce, all
- Microgreens
- Mushrooms
- Okra
- Onions
- Parsley
- Peppers, all
- Radicchio
- Radishes
- Salsa
- Scallions
- Sea vegetables
- Shallots
- Snap peas/snow peas
- Spinach
- Sprouts, all
- Squash: Delicata, pumpkin, spaghetti, yellow, zucchini, etc.
- Tomato
- Tomato juice–¾ c
- Turnips
- Vegetable juice–¾ c
- Water chestnuts
- Watercress

1 serving = ½ c, 1 c raw greens = 25 calories, 5 g carbs

Organic, non-GMO fruits, vegetables, herbs and spices preferred

VEGETABLES Starchy — Carbs

Servings/day_____
- Acorn squash (cubed)–1 c
- Butternut squash (cubed)–1 c
- Plantain– ½ c or ½ whole
- Potato: Purple, red, sweet, yellow–½ med
- Potatoes (mashed)–½ c
- Root vegetables: Parsnip, rutabaga–½ c
- Yam–½ med

1 serving = 80 calories, 15 g carbs

Low Glycemic Impact Recommendations
Short term: Consider removal
Long term: Limit to 1 serving per day

FRUITS — Carbs

Servings/day_____

Unsweetened, no sugar added
- Apple–1 sm
- Applesauce–½ c
- Apricots–4
- Banana–½ med
- Blackberries–¾ c
- Blueberries–¾ c
- Cherries–12
- Grapefruit–½
- Grapes–15
- Kiwi–1 med
- Mango–½ sm
- Melon, all–1 c
- Nectarine–1 sm
- Orange–1 sm
- Papaya–1 c
- Peach–1
- Pear–1 sm
- Persimmon–½
- Pineapple–¾ c
- Plums–2 sm
- Pomegranate seeds–½ c
- Raspberries–1 c
- Strawberries–1¼ c
- Tangerines–2 sm

1 serving = 60 calories, 15 g carbs

Low Glycemic Impact Recommendations
Limit to 2 servings per day
Avoid dried fruit and fruit juices

WHOLE GRAINS (100%) — Carbs

Servings/day_____

Unsweetened, sprouted and organic preferred

Gluten-Free:
- Amaranth–½ c
- Buckwheat/kasha–½ c
- Millet– ½ c
- Oats (rolled, steel-cut)–½ c
- Quinoa– ½ c
- Rice: Basmati, black, brown, purple, red, wild–½ c
- Sorghum–¾ c
- Teff–¾ c

All grain servings are for cooked amounts

Gluten Containing:
- Barley–½ c
- Bulgur–½ c
- Cereal, whole wheat–½ c
- Couscous–½ c
- Crackers, rye–4-7
- Kamut–½ c
- Semolina– ¼ c
- Spelt–½ c

Individual portions:
- Bread–1 sl
- Muesli–½ c
- Pasta–½ c
- Pita–½
- Tortilla–1, 6 in

1 serving = 75–110 calories, 15 g carbs

Low Glycemic Impact Recommendations
Short term: Consider removal
Long term: Limit to 1–2 servings per day

BEVERAGES, SPICES & CONDIMENTS

Unsweetened, no sugar added
- Beetroot juice
- Filtered water
- Sparkling/mineral water
- Green tea
- Low-sodium vegetable juice
- Herbs and Spices: Cayenne, cinnamon, garlic, oregano, etc.
- Condiments: Lemon/lime juice, miso, mustard, tamari, vinegars, etc.–use sparingly, suggest 1 T or less per serving

Items in blue indicate preferred therapeutic foods

IFM

© 2016 The Institute for Functional Medicine

Protein

Protein stabilizes blood sugar and should be included in every meal. In fact, unless there are medical restrictions on dietary protein intake, protein should provide about one-third of the daily calories. Yet in the average Western person's diet, protein comprises only about one-fifth of the total calories. Choose oily fish high in anti-inflammatory fats and low in methylmercury, such as anchovies, herring, mackerel, salmon, sardines, and trout. Another option is free-range eggs which of have about one-quarter of the amount of anti-inflammatory fats found in a serving of fatty fish. The Therapeutic Foods in this category are fish and soy-containing proteins, which provide anti-inflammatory fats for heart health.

Therapeutic Foods: Omega-3 rich fish, and soy-based foods such as miso, tofu, tempeh, and soy protein.

Legumes

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. Many of the Therapeutic Foods in this category can be found pre-packaged in the frozen foods section or bought fresh from the produce section.

Therapeutic Foods: Edamame (green soybeans), black soybeans.

© 2020 The Institute for Functional Medicine

Dairy and Alternatives

The healthcare practitioner will advise the patient whether they should consume non-fat or low-fat dairy products. Too much animal fat in the diet is not healthy for the cardiovascular system; however, there are some important types of fats in dairy (e.g., conjugated linoleic acid) that may be protective for the heart. Therefore, it is worthwhile to talk with a qualified healthcare provider about dietary fat intake. In this plan, there is no guidance on fat content of dairy products on the food list. The Therapeutic Foods include soy milk, and probiotic-containing foods to keep the gut healthy.

Therapeutic Foods: Soy milk, yogurt, kefir.

Nuts & Seeds

Nuts and seeds provide a variety of options to choose from when a snack is needed throughout the day. They can also be sprinkled on top of salads, cereals, or vegetables. Try for at least 1 to 2 servings of nuts on a daily basis. Aim for a mixed blend of unsalted nuts that are not roasted in oil. Tahini (sesame seed butter) can be drizzled over vegetables; almond butter can be spread on an apple slice or cashew nut butter on a sliver of pear. Incorporate some of the Therapeutic Foods from the nuts and seeds category every day.

Therapeutic Foods: Flaxseed, unsalted mixed nuts, and unsalted soy nuts.

Fats & Oils

Fats and oils should contribute no more than about one-third of total caloric intake, with less coming from saturated fats. It is advised to refrain from eating trans fats, which are typically found in highly-processed snack foods like potato chips and baked goods. Notice the foods in this category that are highlighted as Therapeutic Foods. Eat several servings of these foods every week. Keep oils in dark glass containers and throw them out if they smell rancid. Canned coconut milk is included in this category because it is predominantly a fat (not a dairy alternative) when purchased in the can. The processed, boxed variety of coconut milk is a dairy alternative because it is lower in fat and contains some carbohydrate. Small, infrequent amounts of coconut oil are acceptable on this food plan.

Therapeutic Foods: Avocado, avocado oil, olives (black or green), and extra-virgin olive oil.

Non-Starchy Vegetables

This category of foods provides medicinal compounds that can ward off cardiometabolic 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 cardiometabolic 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.

© 2020 The Institute for Functional Medicine

To make a juice from these vegetables, use a blender that keeps the fiber and particulates rather than just squeezing out the sugary juice. If buying pre-made tomato juice, read the ingredient label to make sure it does not contain sugar and is low in sodium.

Therapeutic Foods: All greens such as beet, collard, dandelion, kale, mustard, turnip, chard/Swiss 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. Beets are rich in heart healthy phytonutrients, thus they are considered a Therapeutic Food.

Therapeutic Foods: Beets.

Fruits

These low- to moderate-GI fruits will hit the spot when someone is feeling the need for something sweet. Only 2 servings per day (on a lower calorie plan) are recommended. The Therapeutic Foods in this category contain important phytonutrients that open blood vessels and help with blood sugar control, so it is recommended that either be one of the two choices of fruit each day. 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, pomegranate.

Whole Grains

Whole grains—those with an intact bran, or outer coat—are essential for people with cardiometabolic diseases to eat, as they provide an excellent source of fiber and other phytonutrients that assist with cholesterol reduction and blood sugar stability. Oats and barley, the two Therapeutic Foods in this category, 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 be a trigger food for some people, therefore it is best to limit intake (depending on calorie intake) to 1 to 2 servings per day or omit them entirely from the diet. Patients with celiac disease or gluten intolerance should refrain from eating gluten-containing grains like barley, rye, oats (frequently cross-contaminated through processing of grains unless specified as "certified gluten free oats"), wheat, and spelt.

Therapeutic Foods: Oats, barley.

© 2020 The Institute for Functional Medicine

All the foods on this plan are acceptable unless there is a known food allergy or known sensitivity to any of the foods. There are, however, specific foods that deserve special mention as Therapeutic Foods because of their medicinal attributes for CVD, metabolic syndrome, and T2D.

- **Avocado:** An avocado is the perfect food for cardiovascular health as it contains a considerable amount of fiber (about 9 grams in a whole avocado), healthy monounsaturated fat, and potassium (almost 700 mg for a whole avocado). A study comparing markers of inflammation in individuals who ate a plain hamburger with those who ate a hamburger with half an avocado found that the avocado-laden burger prevented much of the inflammation that occurred compared with eating the hamburger alone!
- **Extra-virgin olive oil (EVOO):** One of the main foods on the Mediterranean diet that has intrigued researchers is 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. When choosing olive oil, extra virgin is an important type to look for, as many of the studies have shown that EVOO is preferable to other types of olive oil. Additionally, 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, such as hydroxytyrosol and oleuropein. Hydroxytyrosol can prevent CVD by reducing the expression of sticky molecules on the lining of the blood vessels. It also helps to prevent the oxidation of LDL-cholesterol. Some of these olive phytonutrients make their way into EVOO and it is thought that these compounds are what make EVOO so healthy!

© 2020 The Institute for Functional Medicine

- **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. Alternately, pre-ground flaxseed meal can be bought at the grocery store. 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 fiber and the best known food source of lignans. Lignans are phytonutrients that are antioxidant, provide fiber, and contain phytoestrogen, all of 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 fiber. 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.

© 2020 The Institute for Functional Medicine

- **Quality soy products (miso, tofu, edamame, soy protein, soy nuts):** 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, fiber, 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 soy, minimize processed soy products like soy dogs, other soy meat substitutes, and soy candy bars, which tend to have other ingredients added that may not be so healthful. In addition, make sure that soymilk is unsweetened. Another way to achieve these health benefits is to try roasted soybeans, or "soy nuts," as a snack. They are tasty and nutritious, with one-quarter of a cup supplying about 100 calories, 9 grams of protein, and 2 grams of fiber. They contain healthy unsaturated fat and close to 35 milligrams of soy isoflavones (depending on the type of soybean). Preferably, choose unsalted soy nuts.
- **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 bonito, tuna, and sardines, contain small proteins that are protective for the heart and can help to reduce blood pressure.

© 2020 The Institute for Functional Medicine

- **Greens (beet, collard, dandelion, kale, mustard, turnip, Swiss chard, lettuce, micro greens, spinach):** 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 particularity high in dietary nitrate include celery, celeriac, chervil, Chinese cabbage, cress, endive, fennel, kohlrabi, leek, lettuce, parsley, red beetroot, spinach, and arugula. The best lettuce choices are those that are darker green or magenta in color; 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 sulfur-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 like ß-carotene and α-tocopherol. 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.
- **Yogurt and 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 cardiometabolic diseases.

© 2020 The Institute for Functional Medicine

- **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 American diet. Another benefit is their low-GI. They can even 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 milliliters, or a little over 1.5 ounces) has been shown to help reduce blood lipids, blood pressure, and plaque buildup in arteries.
- **Barley:** Barley has a rich nutlike flavor and chewy consistency and it contains many important components for cardiometabolic disease while being low-GI. Barley is high in beta-glucan, a fiber that may help lower cholesterol, blood glucose, and insulin responses. Beta-glucan is also able to modify LDL lipoprotein particles in a favorable way—making them large and fluffy rather than small and dense. Those with gluten intolerance or celiac disease should refrain from eating this gluten-containing grain.

© 2020 The Institute for Functional Medicine

- **Oats:** Similar to barley, oats contain fiber, 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. One square of baker's chocolate per day has been shown in studies to have health benefits.
- **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. Talk with a healthcare practitioner as to whether the caffeinated or non-caffeinated variety is indicated.

© 2020 The Institute for Functional Medicine

Condition-Specific Therapeutic Considerations

If there is...	Reduce these foods	Increase these foods
High Blood Pressure	■ Sodium (limit to 2,000 milligrams—about 1 teaspoon per day) ■ Processed foods (packaged, canned) and frozen meals ■ Fast foods ■ Soft drinks ■ Added sweeteners ■ Caffeinated beverages ■ Alcohol ■ Use of oils in high-heat cooking	**Proteins:** ■ Soy (fermented) 30 grams daily: natto, tofu, tempeh, miso ■ Hydrolyzed whey (30 grams daily) ■ Legumes (vegetable protein) ■ Cold water fish: sardines, herring, haddock, salmon, or trout ■ Foods high in L-arginine: lentils, hazelnuts, walnuts, peanuts ■ Mixed nuts (unsalted) ■ Cocoa (30 grams dark chocolate per day, or about 1 square of baker's chocolate) **Vegetables and Fruit:** ■ Blueberries ■ Seaweed (hijiki and wakame), 3 to 4 grams per day ■ Garlic, 1-4 fresh cloves/day ■ Mushrooms, ½ cup shitake, maitake ■ Celery, 4 stalks/day ■ Foods high in lycopene: tomatoes, guava, watermelon, apricots, pink grapefruit, papaya ■ Pomegranate juice **Fats and Oils:** ■ Olive, flaxseed, and sesame oils **Carbohydrates:** ■ Increase complex carbohydrates ■ Increase high-fiber whole grains: oatmeal, oatbran, barley, wheat ■ Fiber: psyllium 7gm
Metabolic Syndrome	■ Sucrose and fructose ■ Processed foods ■ Refined carbohydrates like white-flour breads and pasta ■ Fast foods ■ Saturated animal fat ■ Over-cooked foods (e.g., meats) ■ Food or drink in plastic containers ■ Large meals (aim for smaller meals) ■ Eggs (less than one per day if blood sugar is elevated) ■ Fruit juices	■ Extra-virgin olive oil ■ Cinnamon ■ Green tea ■ Mixed nuts (unsalted) ■ Omega-3 fat sources from food and supplement sources (2 to 4 grams per day, especially in the case of high blood triglycerides) ■ Fiber sources such as whole grains and legumes

© 2020 The Institute for Functional Medicine

Condition-Specific Therapeutic Considerations

If there is...	Reduce these foods	Increase these foods
Dyslipidemia	■ Sucrose ■ Processed foods ■ Fast foods ■ Refined carbohydrates ■ Trans fats (found in processed foods) ■ High amounts of saturated fats (e.g., cream, full-fat cheeses, fatty meat) ■ Margarine	■ Fish ■ Green leafy vegetables ■ Low-glycemic index fruits ■ Tomatoes ■ Extra-virgin olive oil (about 5 TBSP per day) ■ Green tea ■ Soybeans (e.g., soymilk, tofu, tempeh) ■ Dark chocolate ■ Pomegranate ■ Seeds and nuts (especially sesame) ■ Red wine (check with a healthcare practitioner) ■ Garlic (1 to 2 cloves per day) ■ Rice bran oil

© 2020 The Institute for Functional Medicine

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 Cardiometabolic 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. Stevia may be used in limited amounts for food preparation. Only a small amount is required as it is an intensely sweet botanical.

What drinks are allowed?

Drink water throughout the day. A good goal is to drink about half one's body weight in ounces (e.g., a 160-pound person would drink 80 ounces, or 10 cups), with a limit of 100 ounces daily. Drink less water with a meal and more in between meals. Unsweetened herbal teas, such as mint, chamomile, or hibiscus, are also good choices as they provide flavor 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 is an ongoing debate about eggs, particularly when it comes to heart disease. Originally it appeared that the cholesterol in eggs made blood cholesterol rise, but later studies have been conflicted. Healthcare practitioners should consider the patient's dietary preferences and health risk when considering eggs on this plan. For some, one egg per day may be appropriate and for others, egg whites may be best. Some research does suggest that it is better for those with diabetes to have fewer eggs, typically less than one per day.

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 ⅔ 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

© 2020 The Institute for Functional Medicine

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 unfavorable 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, flaxseed, coconut, and soy milks.

Green tea may be a better drink for most people. It contains caffeine, but not as much as a typical cup of coffee, and it can 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 and cooking, but small amounts of coconut oil can also be used. 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. On this plan, a maximum of three teaspoons of coconut oil can be included per day.

How can this plan become even more personalized?

A healthcare practitioner can help clients customize the Cardiometabolic Food Plan for individuals who want or need to also follow vegetarian, pescatarian, or gluten-free diets.

A client may have genetic testing done to identify if they have variations in certain genes related to cardiometabolic health (e.g., AGT, CYP1A2, TCF7L2). This allows the practitioner to consider a client's genetics as one factor in personalizing their food plan. It is more important to consider their dietary preferences, blood labs, and health history than making dietary recommendations based solely on genetics.

Healthcare practitioners can increase personalization by scheduling ongoing "check ins" to discuss what is working well and what needs more support with implementation (e.g., meal planning, recipe selection, integrating meals with family, and assessing how the patient feels emotionally and physically).

© 2020 The Institute for Functional Medicine

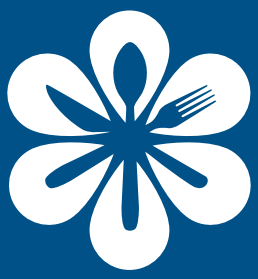
Resources and Tools for Success

The Cardiometabolic Food Plan is intended to be a phytonutrient-dense, metabolically-balanced approach to enabling the body to more effectively regulate inflammation, insulin, and metabolism. It works best when personalized for the patient by the healthcare practitioner. To make the transition seamless, there are a number of other tools to help in the process.

The following handouts are available from Functional Medicine healthcare practitioners to assist patients in implementing the IFM Cardiometabolic Food Plan:

- Cardiometabolic Food Plan – Food List
- Cardiometabolic Food Plan – Weekly Planner and Recipes

© 2020 The Institute for Functional Medicine



IFM®

© 2020 The Institute for Functional Medicine