

MITO FOOD PLAN

Comprehensive Guide



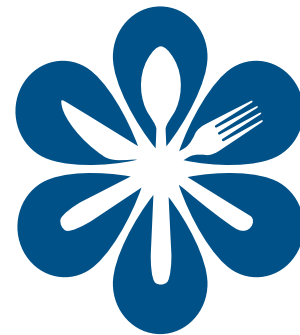


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Why the Mito Food Plan?

The Mito Food Plan may be described as an anti-inflammatory, low-glycemic, gluten-free, low-grain, high-quality-fats approach to eating. The plan focuses on supporting healthy mitochondria through the use of therapeutic foods that improve energy production. Mitochondria are structures in the cell that make energy by using oxygen and nutrients from food. The brain, heart, nerves, muscles, and organs all have higher concentrations of mitochondria. These parts of the body are also more susceptible to a premature decline in function by a host of common insults. Harmful food choices can contribute to this decline, leading to poor health and chronic illness. The Mito Food Plan will support your body in the production of energy, restore a sense of vitality, and help you use food to support a graceful and healthy aging process. The Mito food list can assist in preventing the development of chronic neurological disease by helping people to choose specific foods that enhance mitochondrial function.

Healthy mitochondria are pivotal for cellular survival, overall vitality, and graceful aging. Simply stated, the Mito Food Plan uses food for optimal energy while preventing accelerated aging in our most susceptible tissues. Research has shown that diet and lifestyle interventions can be helpful in providing support for healthy mitochondria. When your mitochondria are working well, they help to reduce fatigue, pain, and cognitive problems while supporting muscle mass and burning excess fat. Which means that you feel better, think more clearly and have less aches and stiffness, all while improving your body composition. Research shows that you can reduce the production of free radicals—molecules that break up bonds between other molecules in a process called oxidative stress—by what you eat. At the same time you can fuel cellular energy production by eating nutrient dense, high quality foods. It is also important to consider how much you eat, how often you eat, and how you cook your food. Research also shows that calorie and carbohydrate restriction, along with eating lean, clean (pesticide and toxin-free) proteins, high-quality fats and oils, and more plant foods may help to prevent or slow down neurological disease. Thus, the plan's focus is on consumption of the right quantity of proteins, fats, and carbohydrates to ensure fat burning, muscle enhancement, and healthy blood sugar balance.



Why the Mito Food Plan?

Damage to the mitochondria can be the result of eating foods that encourage generalized inflammation and pain. This damage increases your risk of developing diabetes and various neurological conditions such as Parkinson's disease (PD), Alzheimer's disease (AD), multiple sclerosis (MS), and Lou Gehrig's disease (amyotrophic lateral sclerosis or ALS). Brain-derived neurotrophic factor (BDNF) is a protein that protects neurons and plays a role in creating new neurons. Neurons transmit information to each other in your brain. BDNF acts like a growth hormone for neurons. It is vital for thinking, learning, and a higher level of brain function. It turns out that levels of BDNF are lower in those with AD and PD! Naturally you want to increase levels of BDNF as a first line of defense against these neurological diseases. How can you do this?

The gene that turns on BDNF production is activated by several factors. These include calorie restriction, curcumin (a spice), docosahexaenoic acid (DHA, an omega-3 fatty acid), intermittent fasting, exercise, intellectual stimulation, and meditation. Additionally, a state of ketosis, brought on by eating a diet lower in carbohydrates, appears to provide the most efficient fuel for the mitochondria and activate BDNF. Conversely, the standard American diet (SAD), obesity, and elevated blood sugar actually lower levels of BDNF.

Food provides a complex message to the body; you want to ensure that message is one encouraging health and wellness. Leading experts have found that there are key foods that actually support mitochondrial health and delay the aging process. You will find these foods highlighted in the list of Therapeutic Foods.



Features of the Mito Food Plan

This food plan was developed through the combined efforts of a team consisting of Functional Medicine physicians, leading experts, and nutrition professionals to assist you in learning how to eat to protect your mitochondria. Current science and clinical experience guided this team in the development of the Mito Food Plan.

- **Therapeutic Foods for Energy**—Creation of energy in the mitochondria is dependent on adequate supply of the right macronutrients (proteins, fats, carbohydrates), along with a generous supply of B vitamins, coenzyme Q10 (CoQ10), and antioxidants. Many of these nutrients can be supplied by phytonutrient-rich vegetables and fruits, yet few eat enough fruits and vegetables on a daily basis to provide adequate levels. Adequate consumption of dietary fats and oils can influence the function and performance of the mitochondria, these fats impact the quality of the inner membrane of the mitochondria, which is where the final steps of cellular energy production involving the coenzyme adenosine triphosphate (ATP) occur. A complete list of the recommended Therapeutic Foods, along with suggestions for how best prepare them, is provided in the “Therapeutic Foods to Eat and Drink Your Way to Healthy Mitochondrial Function” section of this guide.



Some key mitochondrial nutrients, such as CoQ10 and carnitine, are more difficult to obtain through diet alone, especially in a vegetarian diet. Ask your healthcare practitioner about supplementing the dietary plan with additional targeted nutrients.

- **Protective Antioxidants**—Metabolism of food in the mitochondria is dependent on oxygen, but oxygen can also cause oxidation or “rusting” in your cells. You need oxygen, but the steps associated with metabolism and detoxification can often lead to risky byproducts known as Reactive Oxygen Species (ROS) that can cause damage to tissues. Oxidation in excess of healthily managed levels (oxidative stress) from free radicals can accelerate the development of chronic disease, pain, and loss of energy. Damage from oxidation can be reduced by eating nutrient-dense foods that contain protective enzymes and vitamins, also known as antioxidants. Glutathione is one of the most important cellular antioxidants that your body produces. It is also involved in the process of detoxification. Certain vegetables, spices, and quality proteins in your diet enable you to produce and utilize important antioxidants such as glutathione, vitamin C, and N-acetyl cysteine. The more you can use a variety of spices and phytonutrients (nutrients from plants) in your diet, the more you enhance the production of glutathione and other antioxidants that are critical for cell protection from destructive free radicals.

- **Anti-Inflammatory Nutrients**—Maximum phytonutrient density can be achieved by eating a diversity of anti-inflammatory fruits and vegetables. Eating 8–12 servings daily of whole, colorful vegetables and fruits will guarantee a generous supply of anti-inflammatory phytonutrients, minerals, and vitamins, without added sugars. Vegetables should be the primary focus, especially the bitter foods in the cruciferous family (such as broccoli, watercress and arugula) that have strong anti-inflammatory effects. Polyphenols in many of the therapeutic foods, especially blueberries, strawberries, and walnuts, have been shown in both human and animal studies to increase cognitive function and decrease inflammation. They may even help to increase lifespan.

These foods have also been shown to help prevent AD. The incidence of PD and AD has been observed to be lower in populations where anti-inflammatory and antioxidant-rich foods are consumed on a regular basis. For example, the spice turmeric contains the powerful anti-inflammatory substance curcumin. People who eat curry, which contains turmeric, score better on cognitive tests!



- **High-Quality Dietary Fats**—A healthy brain thrives when quality fats such as DHA found in seaweed, egg yolks, and cold-water fish such as salmon, mackerel, cod, and sardines are eaten. Consuming adequate omega-3 fats, critical to the support of the brain's mitochondria, helps in burning fat to produce cellular energy. DHA also assists with communication between neurons and decreases inflammation, necessary for optimal brain health.

It is important to remember diversity when considering oils for cooking and dressing salads or vegetables. Coconut oil, a brain-healthy saturated fat that contains medium-chain triglycerides (MCTs), supports mitochondrial function and may help to improve cognition and modulate inflammation. All organic and unprocessed coconut-based foods (oil, milk, water, grated, flour) have benefits, but caution should be used with sweetened versions. The oil, however, has more of the high quality fats we are striving for.

- **Intermittent Fasting and Caloric Restriction**—Research suggests that people can optimize brain function, longevity, and healthy aging by restricting calories and fasting for intermittent periods. Memory and cognition are thought to be enhanced by eating fewer calories overall. Fasting turns on genes that help cells survive by reducing inflammation. Calorie restriction may also be healthy for one's nerves and support memory and cognition. Eating fewer calories than required by your basal metabolic rate (BMR) allows the brain to make new neurons by decreasing free radicals, enhancing the ability to generate ATP for energy, and increasing the number of mitochondria present. What could be better? Animal studies have shown a decreased incidence of both AD and PD associated with calorie restriction.

Instead of restricting calories every day, intermittent fasting is another way to trigger these changes. It means reducing your intake of foods over a 24-hour period. This can be done by eating only vegetables for 600 calories in one day. Another way is to avoid food altogether for a day, while drinking adequate amounts of water. A 12-hour fast daily from dinner to breakfast is another very efficient way of fasting that involves little preparation! Experts suggest doing this for one day every 1–3 weeks, but check with your provider. They may have specific recommendations for you regarding a fast.

- **Reduced Carbohydrates with Ketogenic Option**—A ketogenic diet is characterized by fewer carbohydrates, a moderate amount of protein and higher amounts of fat. This shift in macronutrients causes your body to switch to utilizing ketones (produced by burning fats) instead of glucose as its primary source of fuel. Ketones (e.g., acetoacetate, β -hydroxybutyric acid and acetone) are produced in the liver when fat is burned instead of glucose and result in more sustained energy throughout the day. Ketones are efficiently used for the generation of ATP (energy) in mitochondria and may help protect vulnerable neurons from free radical damage while increasing the number of new mitochondria. A ketogenic diet mimics the fasting state and has the same benefits for the brain. This option is especially helpful in reducing the risk of epilepsy, MS, ALS and brain tumors.



Features of the Mito Food Plan

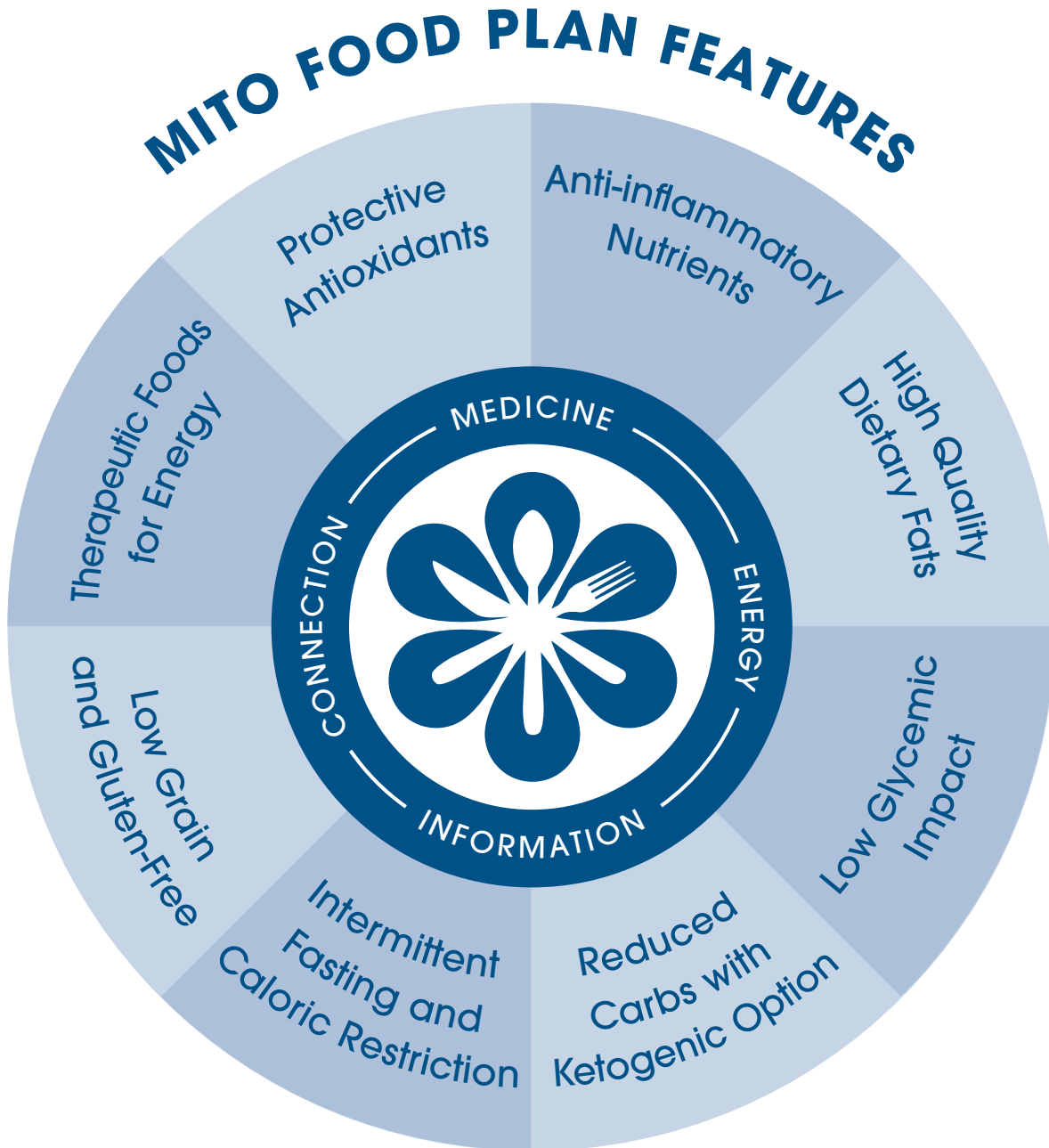
- **Low Glycemic Impact**—Maintaining a lower and consistent insulin level is key to optimal mitochondrial health. A heavily processed, high-glycemic load diet of too many grains and added sugars can lead to increased insulin and inflammation with associated and accelerated mitochondrial dysfunction. Minimizing grains, especially highly processed ones, and using low-glycemic vegetables and fruits as the main source of carbohydrates helps to stabilize blood sugar and protect mitochondria. This way of eating also minimizes fat accumulation.

Reducing glucose metabolism by limiting the ingestion of dietary carbohydrates may have profound effects in preventing or slowing down the trajectory toward AD. Recent research has suggested that even mild elevations of blood sugar may increase the risk of dementia. “Type 3 Diabetes” is a new term used to describe insulin resistance in the brain. It is thought that continual high blood sugar levels lead to changes in the brain resulting in altered learning and memory that are consistent with AD. This is one example of how sensitive mitochondria are to inflammation from excess sugars, antioxidant-poor processed foods, and environmental toxins.



- **Low-Grain and Gluten-Free**—Gluten, a protein found in many different grains such as wheat, barley and rye, is avoided on the Mito Food Plan because of the increased inflammation caused by modern gluten-containing grains. This inflammation destroys the integrity of the lining of the intestine, where nutrient absorption takes place. It also may have a negative effect on brain tissue, affecting memory and cognition. Research has supported an emerging gut-brain connection that connects the immune system in the gut and the brain in a two way communication driven by inflammation.

All grains are minimized or avoided on the Mito Food Plan in order to achieve the desired goals of mild ketosis and low glycemic impact. Grains can easily be replaced by more nutritious foods, such as phytonutrient-dense and fibrous vegetables. Your practitioner may emphasize the gluten-free or grain-free aspects of this food plan, especially if you are experiencing inflammation, pain, fatigue and cognitive decline.



Touring through the Mito Food Plan

As discussed above, the Mito Food Plan includes those foods that are known to support healthy mitochondrial function while maintaining blood sugar and inflammatory balance. These foods are divided into common dietary categories that represent macronutrient levels (proteins, fats, and carbohydrates). The Food Plan is designed to give you a “snapshot” of the foods that are suggested for you to choose from on a daily basis. Therapeutic foods are called out in bold print at the end of each category. For further assistance, refer to our Mito Food Plan-Weekly Menu and Recipes Guide that contains a week meal plan and shopping guide.

Mito Food Plan

PROTEINS		DAIRY & ALTERNATIVES		FATS & OILS	
Free-range, grass-fed, organically grown meats; non-GMO plant proteins; and wild-caught fish preferred.		Unsweetened		Minimally refined, cold-pressed, organic, non-GMO preferred.	
<input type="checkbox"/> Animal Protein:	<input type="checkbox"/> Ricotta cheese-36 c	<input type="checkbox"/> Eggs-2, or 2 egg whites	<input type="checkbox"/> Butter-2T	<input type="checkbox"/> Avocado-36 whole, 2T	<input type="checkbox"/> Olive oil, flavored
<input type="checkbox"/> Fish: Omega-3 rich: cod, salmon, sardines, Alaskan salmon, halibut, herring, shrimp, sardines, etc. 2 or	<input type="checkbox"/> Eggs-2, or 2 egg whites	<input type="checkbox"/> Plant Protein:	<input type="checkbox"/> Kefir, plain-6 oz	<input type="checkbox"/> Coconut milk, regular (coconut)-1/2c	<input type="checkbox"/> MCT, olive (extra virgin), almond, grapeseed, hempseed, high oleic sunflower and seedoils, pumpkin, rice bran, sesame, walnut-1/2
<input type="checkbox"/> Meat: beef, buffalo, elk, lamb, venison, wild wild game-2 oz	<input type="checkbox"/> Eggs-2, or 2 egg whites	<input type="checkbox"/> <input type="checkbox"/> Miso-3T	<input type="checkbox"/> Milk: Cow, goat-8 oz	<input type="checkbox"/> Coconut milk, light (coconut)-9T	<input type="checkbox"/> Chia, cooking:
<input type="checkbox"/> Poultry: Chicken (skinned), Cornish hen, turkey-4 oz	<input type="checkbox"/> Burger alternative: Bison, medallions, veg veggie-1 oz	<input type="checkbox"/> Tofu, tempeh-36 c	<input type="checkbox"/> Milk: Almond, coconut, hazelnut, cashew, hemp, oat, soy-8 oz	<input type="checkbox"/> Coconut	<input type="checkbox"/> Arugula, cucumber, almond, cauliflower, turbot, grass fed butter, MCT, olive (extra virgin), grapeseed, rice bran, sesame-1 t
<input type="checkbox"/> Chicken hard-boiled-36 oz	<input type="checkbox"/> Cheddar cheese-36 c	<input type="checkbox"/> Chickpeas-1/2 c	<input type="checkbox"/> Nuts & Seeds	<input type="checkbox"/> Cacao	<input type="checkbox"/> Chia, cooking:
<input type="checkbox"/> Cottage cheese-36 c	<input type="checkbox"/> Parmesan cheese-2T	<input type="checkbox"/> Lentils-36 oz	<input type="checkbox"/> Almonds-8	<input type="checkbox"/> Coconut	<input type="checkbox"/> Chia, cooking:
<input type="checkbox"/> 1 oz serving = 26-33 calories, 7 g protein	<input type="checkbox"/> 1 oz serving = 36-53 calories, 7 g protein	<input type="checkbox"/> 1 oz serving = 48-103 calories, 10 g protein, 8-8 g fiber	<input type="checkbox"/> Flaxseeds-5	<input type="checkbox"/> Coconut	<input type="checkbox"/> Chia, cooking:
LEGUMES	Proteins/Carbs	Proteins/Carb	<input type="checkbox"/> Mixed nuts-6	<input type="checkbox"/> Coconut	<input type="checkbox"/> Chia, cooking:
<input type="checkbox"/> Beans (soy)-36 c	<input type="checkbox"/> Edamame (soybean)-36 c	<input type="checkbox"/> Lentils-36 oz	<input type="checkbox"/> Mixed nuts-6	<input type="checkbox"/> Coconut	<input type="checkbox"/> Chia, cooking:
<input type="checkbox"/> Black soybean (soybean)-36 c	<input type="checkbox"/> Green peas (soybean)-36 c	<input type="checkbox"/> Chickpeas-1/2 c	<input type="checkbox"/> Nuts and seed butters-36T	<input type="checkbox"/> Coconut	<input type="checkbox"/> Chia, cooking:
<input type="checkbox"/> Dried beans, lentils, or peas (soybean)-36 c	<input type="checkbox"/> Flour, legume-36 c	<input type="checkbox"/> Lentils-36 oz	<input type="checkbox"/> Peanuts-30	<input type="checkbox"/> Coconut	<input type="checkbox"/> Chia, cooking:
<input type="checkbox"/> 1 oz serving = 45 calories, 4 g fat	<input type="checkbox"/> 1 oz serving = 45 calories, 4 g fat	<input type="checkbox"/> 1 oz serving = 48-103 calories, 10 g protein, 8-8 g fiber	<input type="checkbox"/> Peas (soy)-4	<input type="checkbox"/> Coconut	<input type="checkbox"/> Chia, cooking:
IFM					

VEGETABLES Non-starchy		VEGETABLES Starchy		GLUTEN-FREE GRAINS	
Carbs		Carbs		Carbs	
<input type="checkbox"/> Arugula	<input type="checkbox"/> Artichoke	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Amaranth (kernell)-36 c	<input type="checkbox"/> Millet (kernell)-36 c
<input type="checkbox"/> Asparagus	<input type="checkbox"/> Brussels sprouts	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Brown rice (soybean)-36 c	<input type="checkbox"/> Oats (kernell), rolled, steel-cut-36 c
<input type="checkbox"/> Bell chili	<input type="checkbox"/> Carrot	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Quinoa (soybean)-36 c	<input type="checkbox"/> Quinoa (soybean)-36 c
<input type="checkbox"/> Broccoli	<input type="checkbox"/> Cauliflower	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Buckwheat/kasha (soybean)-36 c	<input type="checkbox"/> Tuff (soybean)-36 c
<input type="checkbox"/> Brussels sprouts	<input type="checkbox"/> Cucumber	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Cakes (flax, seed, rice)-3-4	<input type="checkbox"/> Cakes (flax, seed, rice)-3-4
<input type="checkbox"/> Cabbage	<input type="checkbox"/> Eggplant	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> 1 oz serving = 76-110 calories, 16 g carbs	<input type="checkbox"/> 1 oz serving = 76-110 calories, 16 g carbs
<input type="checkbox"/> Cauliflower	<input type="checkbox"/> Endive	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Low glycemic impact (recommended) Low to 1 serving per day	<input type="checkbox"/> Low glycemic impact (recommended) Low to 1 serving per day
<input type="checkbox"/> Celeriac	<input type="checkbox"/> Fennel	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	FRUITS	Carbs
<input type="checkbox"/> Celery	<input type="checkbox"/> Green beans	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Serving/day	<input type="checkbox"/> Serving/day
<input type="checkbox"/> Celery	<input type="checkbox"/> Haricots	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	Unsweetened, no sugar added	Unsweetened, no sugar added
<input type="checkbox"/> Celery	<input type="checkbox"/> Herbes de Provence	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Apples-1 oz	<input type="checkbox"/> Apples-1 oz
<input type="checkbox"/> Celery	<input type="checkbox"/> Lemon, all varieties	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Apricots-2 oz	<input type="checkbox"/> Apricots-2 oz
<input type="checkbox"/> Celery	<input type="checkbox"/> Miso	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Avocados-36 c	<input type="checkbox"/> Avocados-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Mustard	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Bananas-1 oz	<input type="checkbox"/> Bananas-1 oz
<input type="checkbox"/> Celery	<input type="checkbox"/> Olive oil	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Berries-36 c	<input type="checkbox"/> Berries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Pumpkin	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blueberries-36 c	<input type="checkbox"/> Blueberries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Radish	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blackberries-36 c	<input type="checkbox"/> Blackberries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Roasted almonds	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blackberries-36 c	<input type="checkbox"/> Blackberries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Sesame	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blackberries-36 c	<input type="checkbox"/> Blackberries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Sunflower oil	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blackberries-36 c	<input type="checkbox"/> Blackberries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Tahini	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blackberries-36 c	<input type="checkbox"/> Blackberries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Tofu	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blackberries-36 c	<input type="checkbox"/> Blackberries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Vinegar	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blackberries-36 c	<input type="checkbox"/> Blackberries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Walnut	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blackberries-36 c	<input type="checkbox"/> Blackberries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Water	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blackberries-36 c	<input type="checkbox"/> Blackberries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> White vinegar	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blackberries-36 c	<input type="checkbox"/> Blackberries-36 c
<input type="checkbox"/> Celery	<input type="checkbox"/> Yoghurt	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Beans, cubed-2 c	<input type="checkbox"/> Blackberries-36 c	<input type="checkbox"/> Blackberries-36 c
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Legumes

Legumes are an important source of the B vitamin folic acid. They are a healthy alternative to animal protein as they contain quality vegetable protein. They are also a complex carbohydrate, which will help you feel full and keep your blood sugar stable. Legumes may be eaten in the form of soup, cooked beans, dips, or hummus and will complement a non-starchy vegetable. However, legumes are downplayed in this food plan as they are a concentrated source of carbohydrates. Eat one serving a day and limit other carbohydrates if you prefer legumes.



Dairy and Alternatives

Many people avoid dairy products because of allergy or sensitivity, or because they find them inflammatory. Dairy products are downplayed in this food plan for those reasons. Your health care practitioner may advise you to avoid dairy. If you are following a more ketogenic approach, then most dairy products are too high in carbohydrates to include on a daily basis.

However, yogurt and kefir have numerous health benefits because they contain beneficial microbes known as probiotics, important for a healthy digestive system. Kefir is fermented for a longer time than yogurt, resulting in greater probiotic benefits and immune support. Keep in mind that both yogurt and kefir are too high in carbohydrate content for a strict ketogenic program.



There are several dairy alternatives to choose from, such as almond, hemp, oat, coconut, or soy milk (rice milk is not on this food plan as it has a higher glycemic index). Please read the label carefully to ensure you are not getting added sweeteners; evaporated cane juice or brown rice syrup are commonly added to these dairy alternative milks. It is safest to purchase those that say “unsweetened” on the front of the box. Note that coconut milk listed here refers to the boxed variety rather than to its canned form. The canned form of coconut milk is found in the fats and oils section. When choosing soy, it is essential to select only organic soy milks to avoid GMOs. Coconut yogurt (cultured coconut milk) has some added health benefits from its beneficial fats.

While foods in the dairy category are generally high in carbohydrates, cheeses are not considered to be a dairy product because they have negligible carbohydrates. Cheeses are therefore included in the protein category.

Therapeutic foods: unsweetened cultured coconut milk yogurt

Nuts & Seeds

While all nuts and seeds are healthy for the brain, this plan highlights those that are significant sources of beneficial omega-3 oils or brain-healthy MCTs. Be sure to buy nuts that aren't heavily salted and roasted in oil. Eating a variety of nuts ensures getting a variety of phytonutrients.



Don't forget about the ease of using nut butters like tahini (sesame seed butter) drizzled over vegetables or pumpkin butter spread on an apple slice. Another option is adding ground flaxseed meal, chia seed, or hemp seed to a smoothie or sprinkling them on salad. Please note that hemp seed and ground flaxseed may easily become rancid if not stored in the refrigerator or freezer. Chia seed is protected with its own antioxidants so is stable at room temperature. These seeds have differing nutritional benefits so use a variety when possible. An average serving of chia or flax is higher in fiber and carbohydrates and lower in protein than the same amount of hemp seeds. While all three are similar in calories and fats, hemp seeds have less than half the omega-3 fats (1000 mg vs 2400 mg/TBSP).

Therapeutic foods: Almonds, walnuts, coconut, flaxseeds, chia seeds, hemp seeds, pumpkin seeds and their respective butters or pastes

Fats & Oils

It is important to include good-quality fats on a daily basis to help keep inflammatory processes in balance. You will find a vast selection of fats and liquid oils that you can use for salad dressings (cold preparation) and cooking (warm to hot preparation). Choose minimally refined, cold-pressed, organic, non-GMO fats and liquid oils whenever possible, as these will be the best quality. You will want to include several servings per day from these healthy fats.



When possible, use phytonutrient-dense, unfiltered, extra-virgin olive oil to dress salads and vegetables. MCT oil is another option. While butter made from the milk of grass-fed cows is optimal, this may not be easily available; organic butter is the next best option. If your health care provider suggests that you eat no dairy, discuss the use of butter or ghee (clarified butter) or other alternatives. For medium high-heat cooking, coconut oil, MCT oil, and ghee are best because they are less likely to oxidize than other oils. Another advantage of coconut oil is that it is a precursor for beta-hydroxybutyrate, a super fuel for the brain and a critical component of the ketogenic diet approach. Canned coconut milk is included in this category, too and adds nice flavor to casseroles and stir-fries.

Remember that fats and liquid oils break down in heat, light, and oxygen and become rancid. Paying attention to the quality of these oils is imperative. Keep oils in dark glass containers and throw them out if they smell rancid.

Therapeutic foods: avocado, olives (black or green), olive oil (extra virgin, cold pressed), flaxseed oil, coconut oil (organic and virgin), coconut milk, ghee (clarified butter), and butter from the milk of grass-fed cows.

Non-Starchy Vegetables

This category is of utmost importance for providing the necessary phytonutrients that nourish your brain and antioxidants that protect your brain, supporting memory and cognition. There are more selections in this category than any other on the food plan. Try vegetables that you may not be familiar with and to aim for a minimum of 4–6 servings every day (ideally, 10–12 servings per day). A serving is only ½ cup of cooked vegetable or 1 cup of raw leafy greens. You can get four servings in one meal if you fill your plate with vegetables or eat a hearty salad! All greens (including collard, dandelion, kale, mustard, and turnip greens), along with chard/Swiss chard, spinach, sea vegetables, and the many green vegetables in the crucifer family have been found to support the mitochondria in the brain (see page 17 for a list of broccoli family vegetables). Fermented vegetables, such as sauerkraut and kimchee, are also recommended for brain health; they have been shown to improve signaling between the gut and the brain.

The best way to eat an abundance of vegetables daily is to include them in at least two meals (three when possible). Try adding some leftover broccoli, kale, or stir-fried vegetables to your eggs in the morning. Or have leftover salad with eggs at breakfast and add olive oil, avocado, or nuts. Have a large salad with quality protein and avocado or olive oil for lunch, and cooked vegetables or salad with dinner. Try choosing seasonal ingredients. For example, try a red cabbage salad in the winter, when highly nutritious cabbage is abundant. If you make a smoothie for breakfast, add a large handful of spinach or kale or other leafy greens, along with some berries. You will be surprised at how easy it is to add vegetables at breakfast! Or, if you like to make a juice from a variety of vegetables, you might use it in your morning smoothie recipe with added berries. If you buy pre-made tomato juice, be sure it does not contain sugar (read the label) and that it is low in sodium.

In addition to the therapeutic vegetables listed, be sure to eat a “rainbow of colors”: red peppers, tomatoes, and radishes; orange carrots, peppers, and pumpkin; yellow summer squash and peppers; green asparagus, avocado, and green beans; blue/purple eggplant and cabbage; and white/tan mushrooms, jicama, and onions. Purchase organic vegetables (and fruits) when possible (see Frequently Asked Questions [FAQs] for more information on organic foods). If you are unable to find organic vegetables, be sure to wash vegetables carefully and peel (if possible) before eating.

Therapeutic foods: spinach, broccoli and all other cruciferous vegetables, seaweeds, asparagus, Swiss chard, daikon radish, beet greens, dandelion, okra, onion (garlic, scallion, leeks, shallot), fermented vegetables, sprouts



Starchy Vegetables

Starchy vegetables are included on this food plan; however, they are limited to no more than one serving per day, especially if you are leaning to a more ketogenic approach. In general it is preferred to move away from starchy vegetables as they tend to impact your blood sugar (they are moderate to high on the Glycemic Index).

Fruits

Fruits are packed with phytonutrients (plant hormones). Fruits with a low to moderate glycemic response will be your refuge when you are feeling the need for something sweet. All berries are “Therapeutic Foods,” along with pomegranate seeds and grapes with the skin, which have shown to increase levels of glutathione in the body. In addition to improving memory and cognition, blueberries have been reported to contain one of the highest antioxidant levels of all fruits and also help with blood sugar control. Apples contain phytonutrients that suppress inflammation. They may be eaten raw or stewed with cinnamon for added benefit in lowering blood sugar response. Fruit juices are not encouraged as they are dense sources of sugar and can increase your blood sugar levels. Small amounts of dried fruit are acceptable occasionally; you can make your own dehydrated, non-sweetened fruit to eat. It’s always better to couple fruit with a little bit of protein, such as nuts or nut butter, to offset any blood sugar spikes. As with vegetables it is important to purchase organic fruit whenever possible.

Therapeutic foods: apple, blueberries, blackberries, raspberries, strawberries, all other berries, cherries, grapes, mango, pomegranate

Grains

Gluten-free whole grains (those with an intact bran outer coat) provide fiber and other phytonutrients that assist with blood sugar stability and are therefore generally considered healthy grain options. However, they are packed with carbohydrates and are still a higher glycemic food, so are downplayed on this food plan. You might consider avoiding this category entirely, or choose to have only one serving daily, approximately 15 grams of carbohydrate. All the fiber and phytonutrients you need are available from the abundant vegetables and fruits that are on the food plan.



Beverages

It is important to drink plenty of pure, filtered water daily. It is generally recommended to drink at least six to eight glasses. (One glass is 1 cup = 8 ounces or 240 milliliters of fluid.) You might consider adding at least 2 cups of green tea daily. For the best benefit from green tea, steep longer than regular tea if possible. Green coffee extract in a dietary supplement form has also shown to be beneficial to the brain.

Include herbal teas, especially those prepared from adaptogenic herbs like cordyceps, schizandra, ginseng, astragalus, and licorice. See the FAQs for more information on using adaptogenic herbs. Yerba mate, ginkgo biloba, black and white tea, and coffee are other beverages beneficial for brain health. Some of your water intake may be replaced with unsweetened coconut water, which is high in minerals and electrolytes. You may add it to smoothies and mix with green tea or fresh vegetable juice.



Therapeutic foods: Green tea

Sweeteners

Keep in mind that you are striving for a low-glycemic way of eating to support mitochondrial health and reduce inflammation and oxidative stress. Generally speaking, all added sweeteners should be avoided. Stevia is an herbal sweetener that is acceptable in very small amounts. It is wise to reduce your taste for added sweeteners of any kind. Then your taste buds will be able to recognize the natural sweetness in fruits and vegetables! (See FAQs for more on sweeteners.)

Now that you have become familiar with the Mito Food Plan, it might be helpful to have more information on why certain foods are highlighted, as well as how to include them in your food choices. Think of these therapeutic foods as fuel or “medicine” for your brain. While we have detailed twelve of the top choices below, there are many more therapeutic foods in each category highlighted on the Food Plan.

1. Almonds

- Compelling data support eating a handful of nuts each day to reduce chronic disease risk. Research, such as the Nurses’ Health Study (a study of over 238,000 nurses that has been running since 1976), has revealed a link between consumption of almonds and a reduction in heart disease, important to a healthy brain. Almonds contain chemicals called neurotransmitters that are vital for memory and attention. They are a nutritious source of monounsaturated fats, calcium, magnesium, and potassium and are high in phytonutrients and two important antioxidants, vitamin E and glutathione. Other nuts such as walnuts are also brain-healthy because of their DHA content.
- **Serving suggestions:** Use almonds whole, sliced, slivered, or chopped. Carry a snack baggie of almonds in your purse or your car for a quick and easy snack, toss into a salad, add to rice dishes, oatmeal or yogurt, or to cooked veggies (e.g., string beans almandine). Almond butter is a healthy alternative to peanut butter, and almonds may also be ground into almond meal, a flour substitute ideal for lower carbohydrate and/or gluten-free cooking.



2. Avocado

- Avocados are often referred to as brain food. They are a healthy source of quality fat and potassium, as well as glutathione and Vitamin E, both potent antioxidants. The monounsaturated fat contained in avocados also increases your body’s ability to absorb the phytonutrients in other fruits and vegetables that offer antioxidant protection.
- **Serving suggestions:** Fresh avocados do not begin to ripen until they are picked. Avoid purchasing avocados with bruises or soft spots. To ripen, place the avocado in a brown paper bag and store at room temperature for 2 to 5 days, away from direct sunlight. Use to garnish omelets or other egg dishes, hamburgers, soups, and salads; serve guacamole with raw veggies; mash on sprouted grain bread; or slice into a hummus/cherry tomato wrap. One study showed inflammation was lower when half an avocado was used as garnish for a hamburger compared with eating the hamburger alone. Experiment with cooking with avocado oil or as dressing on salads or vegetables.



3. Buffalo/Beef, Grass-Fed

- Meat from grass-fed beef and buffalo is quite different from meat from conventionally raised animals. It is a great source of anti-inflammatory omega-3 fats, since the natural food while grazing is grass and other plants that grow wild. Meat from grass-fed beef and buffalo is higher in omega-3 fats, vitamin E, and antioxidants and lower in saturated fat than meat from grain-fed animals. The ratio of omega-6 fats (an undesirable fat) to omega-3 fats in the meat of grass-fed animals is better than that of corn-fed beef. There is a prevalence of omega-6 fats in the typical American diet, with a ratio of omega 6 to omega 3 of >14:1, rendering them pro-inflammatory.
- **Serving suggestions:** Try ground hamburger from free-range buffalo and beef for burgers or use in your favorite chili, meat loaf, and meat sauce recipes.



4. Blueberries (and all berries)

- Berries, particularly the dark-blue or purplish kind like blueberries and blackberries, are an excellent source of fiber and potent antioxidants that have been shown to improve memory and cognition. Their powerful antioxidants may improve blood flow in your brain, while protecting it from free radical damage. Strawberries have also shown similar improvements in memory and cognition.

Berries are also beneficial brain food because they are relatively low in carbohydrates and have a low glycemic impact. Easily frozen without compromising their nutritional quality, organic berries also tend to be higher in phytonutrients as compared with their conventionally grown counterparts.

- **Serving suggestions:** Add fresh or frozen berries to a smoothie or a fruit salad, top your breakfast oatmeal, or use as a snack.



5. Broccoli (and all cruciferous vegetables)

- Cruciferous vegetables (also known as Brassicas) include broccoli, broccoli rabe, cauliflower, all types of cabbage, Brussels sprouts, kale, collards, turnips, turnip and mustard greens, arugula, watercress, bok choy (Chinese cabbage), kohlrabi, radishes, and daikon. While all vegetables confer health benefits, the broccoli family plays a starring role as it is associated with a reduction of markers for degenerative damage in the nervous system, slowing and even reversing age-related declines in brain function and cognitive performance. Broccoli and other crucifers contain sulphoraphane, which helps protect the brain from excessive inflammation by helping to ramp up the production of glutathione.

Broccoli contains a surprising amount of protein: 5 g per 1 cup serving! Research has shown that crucifers are associated with a reduced risk of heart disease and many cancers, assist in detoxification, stimulate the immune system, slow down cognitive decline, and act as powerful antioxidants. Long-term studies have correlated eating vegetables in the broccoli family with longevity.



- **Serving suggestions:** Chop any vegetable in the broccoli family and allow it to rest for a few minutes before cooking to enhance special cancer-protective properties. Raw and cooked broccoli confer differing benefits, so prepare your broccoli in both ways. Steaming for only 1 ½ minutes is recommended when cooking broccoli.

6. Coconut Oil (virgin, organic)

- Coconut oil and other coconut products have had a reputation as a “bad” saturated fat. In actuality, coconut oil can be helpful in raising your “good” high-density lipoprotein (HDL) cholesterol while lowering the “bad” low-density lipoprotein (LDL) cholesterol. More importantly, coconuts are a rich source of a brain “superfuel” known as beta-hydroxybutyrate.
- **Serving suggestions:** Coconut oil should be both “virgin” (unrefined) and organic. You may use coconut oil for cooking over higher heat as it is very stable and doesn’t oxidize as most other fats and oils do. Use in stir-frying, add to steamed vegetables, stir into oatmeal, or use as a butter substitute to spread on sprouted grain bread or a baked sweet potato. You might also use shredded coconut to top salads and yogurt, or drink coconut water, which is high in electrolytes and minerals.



7. Green Tea

- Green tea contains numerous phytochemicals that may help improve memory and cognition, powerful antioxidants that may decrease oxidative damage to the mitochondria in your brain. Research has shown that aside from helping to prevent cancer and heart disease, green tea offers protection from the development of PD and other brain disorders. The tannins and polyphenols of green tea help the body regulate insulin sensitivity while helping the brain maintain a steady supply of glucose, help to create a positive mood, and may prevent brain damage after strokes and other brain injuries by assisting the body’s DNA repair system.
- **Serving suggestions:** While green tea contains less caffeine than coffee, this may still be more caffeine than some can tolerate. If so, try disposing the first steeping of the tea and steep again using the same tea bag, or use decaffeinated green tea. If the taste of green tea is too bitter, try using cooled green tea as part of the liquid in a smoothie for breakfast! You might try pouring brewed green tea over cooked brown rice and then add some vegetables like seaweed or other greens. Try iced green tea in summer with some lemon juice topped with a mint leaf; substitute green tea for some of the liquid in soup near the end of its cooking; poach pears in green tea with some cinnamon or other spices; or soak peeled hard-boiled eggs in a mixture of green tea and tamari soy sauce (wheat-free) for several days. Also try the recipe for salmon poached in green tea.



8. Olive oil (cold-pressed, unfiltered/cloudy, extra-virgin)

- Olive oil contains protective antioxidant phytonutrients called polyphenols that also confer anti-inflammatory benefits. Olive oil should be labeled “cold-pressed” and “extra-virgin.” It is green in color, has a stronger flavor, and is the result of the first crushing of the olives, the most nutrient-rich. Virgin olive oil comes from the second pressing, is lighter in color, and confers fewer benefits than extra-virgin olive oil (EVOO). When possible, purchase a less-processed, unfiltered (cloudy) olive oil. Store your olive oil in a dark glass container.
- **Serving suggestions:** Use EVOO only when cooking over medium heat as it will become oxidized and rancid if cooked at high temperatures. Use olive oil to dress your vegetables after cooking, or use in salad dressings combined with balsamic vinegar, pomegranate juice, or other favorites. If you are able to purchase the cloudy olive oil, do not cook with it at all; it is best for topping your veggie and salads.



9. Pomegranate

- Pomegranate seeds are one of the richest sources of antioxidants with additional anti-inflammatory benefits. The seeds (arils) are high in fiber and are a good source of vitamin C and potassium. They are also a significant source of those polyphenols that are important in brain health. The seeds should be refrigerated and used within 4–5 days, but the whole fruit will keep for several weeks in the refrigerator.
- **Serving suggestions:** Use pomegranate juice to flavor sauces, dips, and salad dressings. The seeds can be used as a garnish for fruit or vegetable salads. Pomegranate seeds also pair well with olives. Sprinkle hummus or other dips with a few pomegranate seeds and sliced olives for a tart-sweet-salty-bitter burst of flavors.



10. Salmon (wild Alaskan)

- Wild Alaskan salmon is a significant source of DHA, the omega-3 fat known to be one of the keys to a healthy brain. Studies have shown that those who eat more fish high in DHA exhibit better brain health. Wild salmon also contains a powerful carotenoid that gives salmon its distinctive color and acts as an antioxidant. The body’s production of glutathione is dependent on the amino acid cysteine, which is supplied by salmon. Additionally, wild salmon is a good source of CoQ10, another potent antioxidant that participates in the production of cellular energy. Always avoid farm-raised salmon that are grown in pens and fed artificial coloring to create the orange color, as well as fish meal containing chemicals associated with cancer and reproductive problems. Farm-raised salmon often contain PCBs, mercury, and other contaminants that may lead to chronic illness and inflammation.



Research studies support fish consumption for cardiovascular and brain health. Even a modest consumption of fish at 1–2 servings weekly, especially fish containing higher amounts of omega-3 fatty acids, reduces the risk of coronary death by 36%. It is advisable to eat a variety of seafood and limit your intake of mercury-containing fish (in general, larger fish such as tuna and halibut have more mercury) if you eat 5 or more servings a week). But don't avoid tuna altogether. Bonito, tuna, and sardines contain components that are protective for the heart, including certain proteins that help to reduce blood pressure. A healthy heart is consistent with a healthy brain.

- **Serving suggestions:** Stews, soups, baked, slow-roasted, and added to salads (see recipes)

11. Seaweed

- Sea vegetables provide the raw materials for healthy mitochondrial function and nourishment for the nervous system. They have been found to have antibacterial, antioxidant, and immune system-supporting properties. Sea vegetables are an excellent source of minerals such as selenium and magnesium, containing more than 10 times the amount in other vegetables. They provide nourishment for the nervous system and its rejuvenation. Certain seaweeds are very high in calcium (hijiki, arame, and wakame), while others contain abundant amounts of iron (sea lettuce, hijiki, wakame, and kelp), and still others are an excellent source of iodine (kelp, kombu, and arame).
- **Serving suggestions:** Use fresh seaweeds from safe waters and wash before using. Dried seaweed can be found in sheets (nori and dulse) or in strands or powdered. Most are prepared by soaking in water. A longer soak renders the seaweed more digestible. Save the soaking water for use in soups. Once soaked, seaweed can be chopped and cooked in stir-fries, soups, stews, and salads, or made into marinated relish. Other serving ideas include snacking on dried nori sheets, sprinkling dulse flakes on a salad, making a nori roll stuffed with vegetables and sprouts, or using a kelp shaker on your table instead of the salt shaker.



12. Spinach

- Green leafy vegetables contain many antioxidants that help with improving memory and cognition. Spinach, in particular, is also high in carotenoids and flavonoids that provide anti-inflammatory and anti-cancer antioxidant protection.
- **Serving suggestions:** Spinach should be washed well until no dirt remains in the water. Do not leave spinach soaking in water as water-soluble nutrients will leach into the water. While boiling is not recommended for most vegetables, it is best to boil spinach, uncovered for 1 minute only to minimize loss of nutrients and flavor, in order to reduce its oxalic acid content. Oxalic acid binds the calcium in spinach and reduces its availability to the body. Cooked spinach supplies more antioxidants than raw spinach. After boiling spinach for 1 minute, drain and press out the liquid in a strainer. Drizzle it with garlic that has been sautéed in olive oil, or add spinach to soups, or make a salad starring baby spinach with pumpkin seeds and strawberries.



Therapeutic Foods to Eat and Drink Your Way to Healthy Mitochondrial Function

The following table shows the healthful attributes of the different therapeutic foods.

Attributes of the Therapeutic Foods

	Therapeutic Energy Foods	Protective Antioxidants	Anti-Inflammatory	Quality Dietary Fats	Fasting/Caloric Restriction	Reduced Carbs/Ketogenic	Low Glycemic	Low-Grain/Gluten-Free
Almonds	■	■	■	■		■	■	■
Avocado	■	■		■		■	■	■
Beef/buffalo, grass-fed	■			■		■	■	■
Blueberries	■	■			■	■		■
Broccoli	■	■	■		■	■	■	■
Coconut oil	■	■		■		■	■	■
Green tea	■	■			■	■	■	■
Olive oil, extra virgin	■	■	■	■		■	■	■
Pomegranate	■	■	■		■	■	■	■
Salmon, wild Alaskan	■	■	■	■		■	■	■
Seaweed	■	■	■		■	■	■	■
Spinach	■	■	■		■	■	■	■

Why should you follow food plan? Mitochondrial dysfunction is associated with the normal aging process. This food plan can help you to optimize the functional integrity of your mitochondria and prevent accelerated loss of brain function. The first stage of a program for brain protection, pain reduction, and increased energy involves a general reduction of daily calories. The second stage is a further reduction of calories on occasion (intermittent fasting), once a week or more or less often, or a 12-hour fast from dinner to breakfast at least 4 times a week. Topping this all off is a focus on eating nutrient-dense food at all times to nourish aging mitochondria. Now that you understand the importance of protecting your mitochondria in order to slow down the aging process, and avoid degenerative diseases like AD, why would you NOT follow this dietary program?

The Mito Food Plan can guide you to use food as medicine for these three areas of concern:

1. Brain Protection

Brain aging is associated with an overload of inflammatory processes in the brain, resulting in inappropriate oxidative stress. Unless free radicals are deactivated by the antioxidants abundant in phytonutrient-rich colorful plant foods, the resulting oxidative stress accelerates brain aging. That same oxidative stress may also turn on genes for insulin resistance and inflammation, further increasing your risk for diabetes, cardiovascular disease, and perhaps AD (diabetes type 3). Eating to support mitochondrial function is recommended for those

- With a family history for neurological disease, such as Parkinson's disease, Alzheimer's disease, multiple sclerosis, and amyotrophic lateral sclerosis (Lou Gehrig's disease)
- In the early stages of neurological disease
- Who wish to use preventative measures to protect their brain as they age

In the past, scientists believed that loss of brain cells was a normal aspect of aging. That belief has now been challenged by new research that shows that decreased exposure to inflammatory substances in the environment or from lifestyle, including dietary sources, will reduce brain cell death and improve cognitive function.

2. Pain Reduction

Mitochondrial dysfunction has been associated with chronic pain. The same oxidative stress that accelerates brain aging also results in skeletal fatigue, causing tissue demise. From a structural perspective, loss of muscle mass, also known as sarcopenia, is an indication of inflammation and metabolic disease. Sarcopenia is often the result of poor dietary habits. This is why inadequate mitochondrial function has been implicated in several neurological disorders that play a role in nerve pain. The pain that accompanies inflammation will in turn break down connective tissue. Protecting and enhancing mitochondrial function by making specific food choices is one essential way to manage chronic pain. Clearly, food doesn't have the immediate benefit that pain medications may provide, but often it is what you are not eating, such as phytonutrient-rich vegetables, that will reduce the triggers of inflammation. Sugar is a common triggering agent for inflammation and increased pain levels that you might be eating daily. Remember



Strategies for Optimizing Mitochondria

that added sugar is a hidden ingredient in many foods (soups, dressings, condiments, breads, crackers, etc.). Consistent healthy food choices can improve the overall status of foundational nutrition, leading to reduced pain. Anti-inflammatory foods and herbs that relieve pain also reduce the risk of dementia.

Typical cooking methods, such as frying, broiling, and grilling are another factor that needs to be considered. Cooking at high heat, which increases the formation of AGEs (see FAQ's on cooking below), combined with poor blood sugar control may lead to stiffening of the connective tissue and less flexibility, increasing the risk for degenerative joint disease and pain.

There are key anti-inflammatory suggestions that support mitochondrial health and reduce the experience of pain. Consuming the fatty acids EPA and DHA found in cold-water fish, using antioxidant spices, and avoiding gluten and dairy may have a powerful anti-inflammatory effect. People with low back pain also often suffer from low vitamin D levels. The process of rebuilding the nerve sheath is supported by foods high in B vitamins, vitamin D, and other minerals such as calcium, magnesium, and zinc, many of which also provide effective musculoskeletal support. Magnesium and potassium work together to regulate healthy vascular function and improve muscle pain. Quality proteins along with proper digestion complete the picture.



3. Feeling Drained and Fatigued

Mitochondria play an essential role in fatigue as they convert nutrients into energy. Relentless or overwhelming fatigue, i.e., feeling drained, is a direct result of inadequate or impaired mitochondrial function. This is often the consequence of poor glucose management and elevated insulin caused by eating mostly high-glycemic, processed foods. Foods that create a high glycemic impact result can stimulate Inflammation, leading to lower cellular energy production. If a person has insulin resistance, those high glycemic foods can also increase both insulin and glucose in the blood stream. This means more insulin-induced inflammation and less fuel available in the tissue, resulting in muscle loss and increased body fat. And vice versa: the more belly fat a person has, the more inflamed and insulin-resistant they can become.

Hence, ongoing exposure to sugar or high-glycemic foods continues to drive the fatigue state forward. Chronic stress levels, causing release of adrenaline and cortisol over extended periods of time, eventually contribute to the death of your mitochondria. The aging body will have more difficulty disposing of these damaging stress hormones. Eating low-glycemic foods, following the Mito Food Plan, maintaining adequate sleeping patterns, being active, and reducing the negative impacts of stress allow for lower glucose and insulin levels, which in turn reduce dysregulated inflammation and tissue demise.

Strategies for Optimizing Mitochondria

There are additional nutritional considerations in the causes of fatigue and mitochondrial decline. Coenzyme Q10 is a mitochondrial biomarker: reduced levels have been found to have a strong correlation with fatigue. CoQ10 is essential to the energy cycle that occurs within the inner membrane of the mitochondria. Your body makes some CoQ10, but for many suffering from fatigue syndromes, this isn't adequate enough to support tissue health. Since there are no significant food sources of CoQ10, health care practitioners may need to supplement this important nutrient. Low levels of vitamin B12 and folate also play a role in fatigue; dietary sources include wild sardines, tuna, salmon, clams, lentils, and leafy greens.

Anemia (low blood iron levels) is also often overlooked as a mitochondrial connection to fatigue. Anemia is not unusual in menstruating women and those with celiac disease; feeling drained is a common complaint. Mitochondria need iron for the chain reaction that creates energy in the form of ATP. Foods high in iron may be accidentally avoided by those following a gluten-free diet. Many gluten-free substitutes are iron-poor, high-glycemic grains with little or no phytonutrients. Iron-rich foods include beef (grass-fed, of course), venison, lentils, spinach, Swiss chard, sea vegetables, dark chocolate, and pumpkin seeds.

Other Lifestyle Factors for Optimizing Mitochondria

It is important to remember that dietary interventions are just one part of the overall picture of optimizing mitochondrial function. Other lifestyle considerations like exercise, movement, stress and sleep also play a role in mitochondrial health. Exercise and movement has been shown to improve cellular energy production. Both aerobic and anaerobic exercise should be performed on a regular basis. Exercise is critical for brain health in general and has been shown to reduce the risk for AD by about 30%. Exercise also helps to relieve stress, which contributes to inflammation and mitochondrial decline, by burning up excess stress hormones, while also improving your mood. Appropriate sleep is also important for mitochondrial health. Animal studies have shown that getting adequate sleep helps to reduce mitochondrial stress. Without sufficient sleep there is an increased risk of neurodegenerative changes within the brain.



This dietary approach allows for further personalization depending on your therapeutic goals. Explore some of these options with your health care provider or nutrition professional to tailor this plan to meet your health care needs.

- If you have known food triggers or sensitivities, those foods should be avoided.
- Calories can be targeted to meet your health care goals; this will help you choose how many servings in each category to eat. Allowed carbohydrate servings should be spread throughout the day.
- Periodic intermittent fasting may be suggested in the form of extended time gaps between the evening meal and morning breakfast or by reducing intake to 600 calories for one day per week. See the FAQ section at the end of this document for suggestions on calorie reduction.
- Meal timing and the inclusion/exclusion of snacks can be modified to meet your clinical needs.
- A dietary program that leads to mild ketosis may be encouraged to improve mitochondrial and neurologic function.
- Your provider may have specific recommendations for things to avoid, such as dairy foods or all grains. Your provider may include additional foods based on your individual needs, genetics, cultural eating preferences, or therapeutic goals.

Meal Timing and Ketogenic Diets

An important caveat must be given in regard to popular dietary programs for those with insulin resistance that suggest eating frequent small meals to keep blood sugar stable and burn more fat. Some people do well with four to five meals and snacks throughout the day, showing improvement in laboratory markers and symptoms.

However those with higher risk markers for metabolic syndrome (increased waistlines and belly fat, elevated triglycerides, low HDL levels, increased blood pressure,

and rising fasting blood sugar levels) may improve more by eating less frequently, especially eliminating snacks.

Insulin and inflammation are released following a meal; some feel better overall if that happens less often during the course of the day. Meal frequency becomes less important when blood sugar is stable and hunger occurs less often!



Personalizing the Mito Food Plan for Success

How can you manage to be hungry less often? It is fairly simple: eat foods that do not cause peaks and valleys in your blood sugar and insulin levels. This will keep inflammation and cravings down while protecting important tissues. A ketogenic approach uses fewer carbohydrates in general, with less blood sugar spikes that lead to hunger. The resulting lack of hunger and cravings makes it easier to go for longer periods without even thinking about food. It is critical, however, to be sure to ingest high-quality vegetables, fruits, and proteins.

There are various opinions regarding the amount of carbohydrate allowed on a ketogenic plan. The most rigid approach that seems to guarantee ketosis allows no more than 20 grams of total carbohydrate per day. This is often prescribed for patients who are experiencing seizure disorders or suggested for those initiating a weight loss program using a strict ketogenic diet. Other ketogenic approaches allow up to 40 or 50 grams per day, supporting a milder ketosis state. If the therapeutic goal includes body fat loss, improved energy levels, enhanced muscle strength, or enhanced neurologic function or



brain protection, a ketogenic focus may be clinically indicated. The reasons that lead you to choose a ketogenic approach may be factors when deciding how rigidly compliant you might need to be. For example, a healthy person who desires to live long and stay healthy into old age while maintaining good memory and cognition might choose a less restrictive approach. Their carbohydrate intake (not counting non-starchy vegetables) may be as much as 60–80 grams/day. But, when there are signs of compromised brain function, a strict approach ingesting fewer carbohydrates might be indicated, about 40 grams/day. Your practitioner can guide you in making these decisions and help you know how much to eat of what on the Mito Food Plan.

A pitfall of a more restrictive ketogenic diet is the impossibility of ingesting the recommended 8–12 servings of phytonutrient-rich vegetables and fruits needed for a brain-healthy diet. One approach, somewhat less restrictive, allows no grains and limited amounts of the following carbohydrate-containing foods: dairy foods (full-fat cheese and unsweetened yogurt), legumes, fruit, and starchy vegetables. Amounts are limited to 20–30 grams of carbohydrate for males and 15–20 grams for females. Some providers might suggest that you eliminate dairy from your diet because of the potential for formation of antibodies that may cause an immune reaction to all dairy foods. No limit is placed on non-starchy vegetables because of the powerful phytonutrients found in these foods. Ketosis is still achieved, although perhaps to a milder degree; this approach still shows increased mitochondrial efficiency and improved brain function. (See FAQs for more on testing for ketosis.) Such a mild ketogenic approach with a focus on healthy fats, adequate protein, and a colorful amount of phytonutrient-rich foods is the foundation of the Mito Food Plan.

Calorie Reduction and Enhanced Health

We know today that tracking “calories in and calories burned” doesn’t necessarily equate to a healthy body type or optimal health. Science supports the concept of QUALITY foods distributed throughout the day. Therefore, the Mito Food Plan offers two options to control carbohydrates while providing adequate protein and plenty of healthy fats. This food plan can enable a person to decrease calories as the scientific literature supports and still be satisfied with flavorful foods that provide dietary fiber from colorful plant sources, moderate protein, and healthy fats that provide adequate fuel for the mitochondria and healthy brain function.



Research suggests that calorie restriction will slow the aging process. As a result, some practitioners have begun urging their patients to lower calorie intake to 20–30% below what their basal metabolic rate requires to maintain a steady weight. Calorie restriction also activates an important metabolic process called the Nrf2 pathway. This process increases production of antioxidants and detoxification enzymes and decreases the formation of toxic free radicals. For example, stimulating the Nrf2 pathway enhances your body’s ability to make the important antioxidant called glutathione, which reduces damage to tissue and slows down the aging process.

So what does a high-quality vs high-quantity diet look like? If you imagine that calories are a measurement of financial currency, you are striving to get a bigger bang for your buck through dietary choices. You want to spend less time and energy metabolizing food, while getting a more protective and beneficial response from the food you do eat. In other words, you want the highest level of nutrition content for the lowest amount of calories. For example, if you typically eat about 1500 calories, you might try eating 1000–1200 calories per day, occasionally reducing calories even more for a modified fast. This may seem very daunting at first, so picture your typical plate at dinner and just eat about a quarter less, focusing on eliminating the higher calorie foods. It is best not to limit vegetables; instead, limit all other foods. You may need to start gradually and decrease calories slowly. This is easiest to do when you are not socializing! Try this first when you are alone or with just your family. Notice how pleasant it feels not to have a bloated or full feeling long after dinner. Reducing calories to 600 a day once or twice a week is an alternative way to ‘fast’ or reduce calories intermittently. See the FAQs section at the end of this document for more suggestions on calorie reduction.

Personalizing the Mito Food Plan for Success

To support the concept of reducing calories by 20–30%, it may be helpful for you to understand the following and to use calories as a general guide in choosing quality food portions throughout the day from the Mito Food Plan list:

- Average calories consumed per day for males (assuming moderate activity) is generally 2000–2400 calories, so a 20–30% reduction of calories would be a range of approximately 1400–1800 calories per day.
- Average calories consumed per day for females (assuming moderate activity) is generally 1400–1800 calories so a 20–30% reduction of calories would be a range of approximately 1000–1400 calories per day.
- These generalities are only intended to be a place to start in the journey of choosing healthy foods sources. Please note that calorie and macronutrient needs are dependent on an individual's size, activity level, and gender, so working with a qualified practitioner is highly recommended for best results.

Your health care provider will help you determine how many serving sizes to eat each day to promote healthy aging through a mild ketogenic distribution of calories.



Can you explain more about mitochondria?

Mitochondria, the powerhouses in every cell in your body, convert food and oxygen into clean energy called ATP that powers the cell's activities. Mitochondria help to detoxify poisons (e.g., pesticides, toxins in the food supply, pollution in the air, etc.) that get into your cells. Molecules called 'free radicals' are produced as part of this energy exchange. These free radicals need to combine with other molecules or oxidation will occur. Oxidation in nature is seen when iron rusts in the presence of oxygen and moisture. A similar process happens inside the body. Excess free radicals can damage the brain by initiating cell-death, leading to premature aging. Your body tries to defend itself against free radicals by producing antioxidants that neutralize their effects. In addition to the antioxidants that your body is able to produce, you also get a plethora of antioxidants from the phytonutrients in colorful vegetables and fruits.

Deterioration of mitochondria in the brain is a major cause of all neurological diseases such as PD or dementia. This oxidative process, also called oxidative stress, contributes to the acceleration of these diseases.

Can you summarize the high antioxidant foods?

Many foods, particularly vegetables and fruits, contain an abundance of antioxidants. Some of the highlighted therapeutic foods on the Mito Food Plan are high in antioxidants. For example, grapes, red wine, purple grape juice, peanut skins, and dark chocolate contain an antioxidant called resveratrol that helps the function of the mitochondria. These foods will activate the genes for the production of detoxification enzymes and antioxidants and even improve fat burning for energy.



Other important antioxidants found in the broccoli family help your body to make glutathione. Herbs and spices, green tea, and berries also help to control oxidation. Some less common vegetables that enhance digestion and provide beneficial intestinal flora include fermented foods, such as kimchee or sauerkraut, and seaweeds, like wakame and bladderwrack.

Can you explain more about the benefits of intermittent fasting and calorie restriction?

Remember: eating fewer calories increases the protein BDNF, which acts like a growth hormone for the brain, and also activates the Nrf2 pathway, which increases production of antioxidants and detoxification enzymes! Some experts suggest that you fast 1–2 times a month for 24 hours, drinking only water. This may be very difficult for some to do. It is always wise to discuss it with your doctor before attempting a fast such as this. But, you can also practice the 12-hour fast from dinner to breakfast to increase your BDNF and Nrf2 pathway! Do this as often as possible; at least 4 times a week. The trick for success is to be sure to eat enough protein and veggies at dinner, so you will not be hungry later in the evening and want to snack.

Frequently Asked Questions

Other methods of fasting include reducing calories to 600/day once a week, consuming 20–30% fewer calories than your BMR suggests, skipping snacks, and spreading out meals by 5 to 12 hours. Use of coconut oil mimics the effects of fasting: the MCTs (medium chain triglycerides) in coconut oil increase levels of ketones, which creates an effect in the body similar to fasting and carbohydrate restriction.

How do I calculate a 600 calorie meal plan?

One easy way to control calories to 600 calories per day is to use one of the quality vegetarian based protein powders or medical foods available today. Choose unsweetened protein powders made from quality pea proteins, rice proteins or combinations of pea, rice, chia and hemp. Most provide a total of 130–160 calories and 15–25 grams of protein per 2 scoops serving when added to unsweetened almond or coconut milk. This can provide a sustaining and healthy balanced food replacement throughout the day. Another way is to use modest amounts of food as follows:



- Suggested 600-calorie “day at a glance” focusing on a protein powder: Use cold milk alternative and shake well with powder in a shaker cup. Aim for four servings approximately 4–5 hours apart for best satiety.
 - **Example:** 2 scoops unsweetened protein powder added to 1 cup unsweetened almond or coconut milk (40–50 calories) = 130–160 total calories. Repeat this three more times throughout the day. If desired, you may use a blender and add ice and a handful of greens to each smoothie
- Suggested 600-calorie “day at a glance” focusing on a modest amount of quality protein, small amounts of healthy fats, and 3–4 servings of non-starchy vegetables.
 - **Breakfast:** 1 egg scrambled with ½ cup spinach sautéed in a small amount of chicken broth, topped with 1/4 of whole avocado, pinch of sea salt, and pepper.
 - **Lunch:** ≈2 ounces of cooked turkey or chicken over 2 cups of mixed baby greens, ½ fresh lemon, 1 tsp olive oil drizzled over greens and chicken, with pinch of sea salt and cracked pepper.
 - **Dinner:** ≈3 oz. Poached or broiled salmon and ½ cup steamed broccoli both drizzled with ½ tsp olive oil juice from ½ lemon or lime, pinch sea salt and fresh herbs of choice.

How else can I reduce calories by 20-30% as suggested?

There are some simple ways to implement this calorie reduction into your regular eating patterns. If you usually buy 1 pound of ground beef or lamb and make four burgers of 4 ounces each, you might try making five burgers of 3 ¼ ounces each. The difference will be hardly noticeable, but you will have reduced your protein calories by 25%! For breakfast, if you are used to having three eggs and two slices of toast, try just having two eggs and no toast or just one slice for starters. Add veggies and assess your hunger. Or reduce a 6-ounce portion of protein at lunch or dinner to 4 ounces. Generally, if you wait about 20 minutes after eating, you will no longer feel hungry, so be patient! If you are used to having a sandwich at lunch, try half a sandwich and fill up the rest of your plate with veggies, which are the healthiest brain food. Better yet, avoid the bread altogether and have a large salad with greens, veggies, protein, and healthy oils for dressing and you will notice that you will be satisfied for much longer than when you ate a sandwich at lunchtime. And you can imagine your mitochondria dancing with joy! In general, eating fewer calories, no matter how it is done, will benefit your brain and its mitochondria.

How many carbohydrates are in the foods I eat?

The Mito Food Plan lists the approximate carbohydrates in a serving of fruits, vegetables, grains, legumes, and dairy foods. Serving size varies within each group. This will give you an idea of the carbohydrate content of the foods on this plan.

What would a typical day's meals look like if I limit carbohydrates to 60 grams per day?

Our menu plans will illustrate how to do this, but here is a sample. It is not as hard as you think. Just focus on brain-healthy proteins and veggies!

- **Breakfast:** spinach omelet (two eggs) with 1 cup spinach cooked in coconut oil, plus a small handful of pumpkin seeds or walnuts and ½ cup blueberries
- **Lunch:** grass-fed beef or buffalo burger or an organic turkey burger with 2 cups of salad greens (or a mixture of kale and greens) plus 2 cups of raw veggies, tossed with olive oil and your favorite vinegar, and a roasted seaweed snack
- **Dinner:** wild salmon with 1 cup cooked broccoli and salad of 1 ½ cups greens, ½ cup cherry tomatoes, ½ cup thinly sliced red cabbage, handful of almonds, and ¼ avocado, tossed with olive oil and balsamic vinegar



How will I know if I am in ketosis?

Urinary testing for the presence of urinary ketones should be performed daily. The goal is for mild to moderate ketosis.

If I wish a stricter ketogenic approach, how would I go about this?

The Mito Food Plan can be used for guidance but needs to be directed by a trained nutritionist who is familiar with the ketogenic diet approach. This type of approach must be closely monitored by the patient and the health practitioner. With that said, here are some basic considerations for a stricter ketogenic approach:

- **Keep carbohydrates low.** This is very individualized and based on metabolic individuality and activity level. Range can be anywhere from 20 grams for the adult to 80 grams per day for a very active athlete.
- **Eat healthy fats:** These can be as high as 50–60% of your diet. Focus on butter from grass-fed cows, coconut oil, MCT oil, nuts, olives and olive oil, avocados and avocado oil, and full-fat organic dairy if suggested by your health care practitioner.
- **Moderate amounts of protein from pesticide- and toxin-free sources:** Average ranges can be from 70 to 80 grams per day on days that you don't exercise, up to 120 grams on days that you perform resistance exercise, depending on your size and activity levels.
- **Test for ketones often:** As it takes 3 days on a ketogenic diet to achieve ketosis, urine testing should be started after 3 days. Daily testing is important, particularly for those who have epilepsy or ALS. The testing goal is for trace to moderate ketones. Adjust carbohydrates if ketones are not detected by increasing exercise or decreasing starchy vegetables or fruits by 7–15 grams (1/2 to 1 serving).
- **Be aware that:** Occasionally the urine strips may not reflect ketosis even when compliance to the diet is high. This is fine if other markers are improving such as glucose and insulin levels, triglycerides, or body composition.



Frequently Asked Questions

Why is organic food so important?

The importance of pesticide and toxin-free food from local, free-range, grass-fed, and organic sources cannot be stressed enough. Such foods are extremely important for brain health. Organic foods are grown without the use of pesticides and synthetic fertilizers. Organic meats, poultry, dairy, and eggs all come from animals that have not been raised on antibiotics or growth hormones. Free-range meats come from beef, buffalo, chicken, or lamb that have not been fed corn or other grains, but have been allowed to roam free and eat grasses that are naturally higher in healthy omega-3 fats. Research has shown that organically grown fruits and vegetables retain greater nutritional value than foods grown with pesticides and other chemicals. The food plan also stresses avoiding highly processed and junk foods and refined sugars. See the Environmental Working Group website (www.ewg.org) for a list of produce containing the highest level of pesticides (“dirty dozen”), along with those containing the least amount of pesticides (“clean 15”). Be aware when purchasing foods from foreign countries, such as Mexico or China; they have different laws regarding organic foods. Buy locally grown food as much as possible.

Environment Working Group's Clean Fifteen/Dirty Dozen

EWG's Clean Fifteen™ for 2014 <i>Produce least likely to hold pesticide residues</i>	EWG's Dirty Dozen™ for 2014 <i>Produce most likely to hold pesticide residues</i>
<ul style="list-style-type: none">■ Avocados■ Sweet corn■ Pineapples■ Cabbage■ Frozen sweet peas■ Onions■ Asparagus■ Mangoes■ Papayas■ Kiwis■ Eggplant■ Grapefruit■ Cantaloupe■ Cauliflower■ Sweet potatoes	<ul style="list-style-type: none">■ Apples■ Celery■ Cherry tomatoes■ Cucumbers■ Grapes■ Nectarines■ Peaches■ Potatoes■ Snap peas■ Spinach■ Strawberries■ Sweet bell peppersPLUS...■ Hot peppers■ Kale/Collards

Source: Environmental Working Group (ewg.org)

How can I cook in a way that supports brain health?

During cooking, tasty aromatic compounds form; so do inflammatory substances called advanced-glycation end products (AGEs) that can actually poison your mitochondrial function, increasing oxidative stress. The higher the heat and the browner the food, typically, the greater the amount of potential inflammation from the meal. AGEs are primarily found in meats cooked at high temperatures, other highly processed foods, and full-fat cheeses. Cooking with moisture over low heat, such as cooking in a crockpot or slow cooker, poaching, steaming, and stewing, is a healthier option. If you eat food that is grilled, charred, broiled, seared, or crisped, eat it together with fresh cooked greens (spinach, kale, chard, arugula, etc.) or in a salad, as this will help decrease the inflammation that may result from the browned foods. Adding certain spices (see below) to food cooked over high heat may reduce the formation of other damaging molecules, such as heterocyclic amines (HCAs), as the chlorophyll in greens binds with HCAs. While it is not possible to totally avoid AGEs, reducing your exposure whenever feasible will help reduce the total load. Try some of our recipes using healthier cooking methods to reduce formation of AGEs.



How will I know if I have an allergy or sensitivity to dairy?

If you or your health care practitioner feel that dairy might be causing you to have some negative reactions, it would be wise to avoid it for 2–3 weeks and see if you feel any improvement in your symptoms. Casein (the protein in cow's milk) has a cross-reactivity to gluten, so if you are sensitive to gluten, you may need to also avoid dairy foods to avoid an inflammatory response. Discuss this with your healthcare practitioner if you have any concerns.

Why are herbs and spices important in this food plan?

Spices are medicinal, concentrated herbs that can have anti-inflammatory and antioxidant effects in neurological disease. The Mito Food Plan encourages a generous use of various spices, such as basil, black pepper, cayenne, cilantro, cinnamon, cloves, curry, fennel seed, garlic, ginger, marjoram, oregano, paprika, parsley, rosemary, sage, and turmeric. ALL spices and herbs have the potential to limit the damage from oxidation. For example, you now are more aware of the importance of glutathione as an antioxidant. The curcumin in turmeric stars in brain health as it has the potential to activate genes that produce detoxification enzymes and thus ramp up the production of glutathione. Turmeric has been shown to reduce buildup of the beta-amyloid protein that is found in high amounts in the brains of those with dementia.



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Using a variety of herbs and spices will help you to develop and experience new tastes. It is recommended that you dress up your daily meal with a spectrum of spices as they will make your food taste more interesting and give you more medicinal impact. Some studies even suggest that spices can reduce some of the oxidative damage and formation of cancer-causing substances that occur with cooking. Try incorporating rosemary into hamburger meat before grilling or adding turmeric to a vegetable stir-fry. Combining black pepper with turmeric increases its availability in cooked dishes. This combination can also be sprinkled on eggs. You may want to experiment with its flavor on different foods and sauces. You might also try sprinkling cinnamon on warmed almond or coconut milk drinks to help your body respond to high insulin, which can damage the brain over time.

Here's good news for the chocolate lovers: cocoa, actually considered a spice, may also enhance healthy brain function by increasing cerebral blood flow to gray matter in the brain, and improving memory and cognition! Cocoa's high antioxidant levels may help protect your DNA and support healthy cardiovascular function.

Suggestions for buying herbs and spices?

- If you buy spices in bulk, store them in air-tight glass or tin containers. Buy only what you will use within 6–12 months. Whole spices will keep for a longer time, up to 2–3 years.
- Purchase herbs and spices in all forms: fresh, dried, whole, cracked, coarsely ground, and finely ground
- Store herbs and spices in a cool, dark place. Heat, light, and moisture will accelerate loss of flavor. High temperatures can cause spices to cake or harden and change or lose color.
- Don't keep spices on or near the stove and keep container closed.
- To test for freshness, rub between fingers and sniff to check for an aroma.



I dislike the taste of green tea. What else can I drink on the Mito Food Plan?

First try some of the suggestions given for integrating more green tea into your diet. If these don't work, then try ginkgo biloba tea, which provides similar benefits as green tea. Herbal teas, black tea, and coffee also have some antioxidant benefits. If caffeine bothers you, be sure to purchase Swiss water-processed decaffeinated coffee to avoid the chemical solvents used in most decaffeinated brands. Please avoid anything with added sugars, including diet soda. Plenty of pure, filtered water should always be part of your day.

What are “adaptogenic” herbs?

Another brain-protective use for herbs is in making herbal teas from certain herbs known as “adaptogenic herbs” because they can adapt to conditions in the body. Adaptogenic herbs are plants that exert a normalizing influence on the body. They neither overstimulate nor inhibit normal body function, but help the body to cope more effectively with stress by recharging the adrenal glands. The star of these herbs for brain health is Asian ginseng, which also has antioxidant properties. Other than Asian ginseng, you may want to try various herbal teas such as American and Siberian ginseng, astragalus, cordyceps, licorice, reishi, and schizandra berries. Remember the BDNF that we talked about earlier? It protects your nervous system and is vital for thinking and learning. Ginseng stimulates BDNF while helping with blood sugar management! What could be better?

How can I cook with or make tea from the adaptogenic herbs?

Herbs should be bought in small amounts in the bulk section of your health store. If you buy any roots, they should be pulverized before use. To make tea, place your herbs in a 1-quart glass measuring cup and pour 1 quart boiling water over the herbs. Allow to steep for 20–30 minutes and then strain before drinking. You may steep herbs longer (up to a few hours) if you wish a stronger taste and more medicinal value. Alternatively, you may purchase these herbal teas at the health food store so you can brew them more quickly.

When cooking adaptogenic mushrooms, such as reishi, cook in water rather than oil. Astragalus may be added to mushroom or chicken soup.

What about drinking alcohol?

Alcohol can improve blood flow to the brain by lowering your blood pressure! Red wine in particular contains brain-friendly antioxidants, in addition to resveratrol, a phytonutrient that helps to relax your blood vessels. However, alcohol is also a form of sugar, which may not be good for those eager to improve brain health.

There is no consensus regarding the impact of alcohol on the health of the aging brain, particularly as it relates to AD. One study suggested that light to moderate alcohol intake, in particular wine, is associated with a larger brain and may have potential benefits for brain aging. Out of 19 studies on drinking and AD, 7 report a decreased risk of AD, 3 found an increased risk of AD, while 9 reported no impact on AD. For a generally healthy person, one glass of red wine may be perfectly acceptable at meals, especially if you are leaning toward a more ketogenic diet.

Alternatively, you might try to include foods that are high in resveratrol, such as red grapes, dark chocolate, peanuts, and purple grape juice. Discuss drinking alcohol with your health practitioner as he or she knows your health history and can make a determination as to whether moderate or occasional use of alcohol would be appropriate and consistent with your health goals. In addition to adding food sources of resveratrol, he or she may suggest you avoid alcohol and take supplemental resveratrol.



I don't see any sweeteners on the Mito Food Plan. What can I use on the plan as a sweetener?

It is essential that you refrain from all added sweeteners to the best of your ability when following this food plan. The damaging effects from inflammation that sugar can have on your blood vessels and brain are long-lasting. In addition, high-intensity sweeteners can lead to blood sugar imbalances, increased calories and subsequent weight gain, and continued cravings. If you are craving something sweet, choose from the fruits on the Mito Food List. While label reading is important to detect added sugars, the Mito food plan doesn't encourage eating processed foods. You don't have to worry about hidden sugars in fresh vegetables or fruits!!

Artificial (synthetic) sweeteners should also be completely avoided; new research is finding that these high-intensity sweeteners may have negative effects on metabolism and could spur food cravings. Some of these actually act as "Excitotoxins" in the brain and promote free radical formation. These types of sweeteners include NutraSweet® (aspartame), Splenda® (sucralose), acesulfame-K (Ace K, Sweet One®, Sunett®), and Sweet N' Low® (saccharin, sodium cyclamate).

What condiments are acceptable?

Many condiments like teriyaki sauce, ketchup, barbecue sauce, and glazes have sugar added. It would be best to avoid them entirely or make your own versions that are healthy. Adding more spices and fresh herbs in your food preparation will create less need for unhealthy condiments. Gluten-free tamari or soy sauce, coconut aminos, tabasco sauce, fish sauce, and most mustards are acceptable. Please check labels as some brands have added sugars.

Can I exercise while I'm on this program?

Exercise is an important part of any program that is designed to improve brain health. It is strongly recommended that you exercise aerobically at a moderate level at least 150 minutes (2½ hours) a week, including weight training at least twice per week. Compelling research has indicated that exercise helps to oxygenate the brain and particularly affects learning and memory. Exercise also activates the gene that turns on BDNF, which protects our neurons and helps to create new ones.



In Summary

We have presented you with the most up-to-date information and research about brain health. Food IS medicine; you should now appreciate what food does for you besides fill our stomachs. Food supports and heals your body in ways you never knew, but only if it is fresh whole food! Maintaining the integrity of your mitochondria is pivotal to healthy aging.

You now know the importance of antioxidants and anti-inflammatory foods. You DO have the power to take care of your brain. You have learned the value of a ketogenic diet, calorie restriction, and fasting. The strategic position of fresh fruits and vegetables cannot be stressed more strongly. The importance of keeping your blood sugar stable to avoid the development of diabetes type 3, otherwise known as Alzheimer's disease, should be a focus. The therapeutic use of herbs and spices is another important concept. Eating healthy fats that are not "low fat" may be a new concept. Avoiding gluten-containing grains may be difficult but also critically important for many. Lastly, avoiding cooking over high heat whenever possible may be more important than you might have realized. These concepts, when put all together in one program, will start you on the road to aging gracefully and more slowly.

"...plan your foods like your pension, feel good about eating for the future and never skimp even when other pressures are brought to bear. The health of your mitochondria and the future you, will thank yourself for it!"

—Dr. Michael Ash

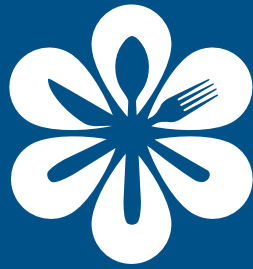
Changing food habits can be a complex and difficult process. To help you, we have included recipes, menus, and other information to make this a “do-able” process. Look over this information carefully. If you have any questions about the diet, or any problems, please contact your health care practitioner.

The following handouts are available to help you use the Mito Food Plan:

- Mito Food Plan – Food List
- Mito Food Plan – Weekly Planner and Recipes
- Phytonutrient Spectrum Foods
- Phytonutrient Spectrum Comprehensive Guide

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