# Plant-Based Eating to Fight Diabetes

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# About Oldways

- Nutrition nonprofit founded in 1990
- **Mission**: To inspire people to embrace the healthy and sustainable joys of the old ways of cooking and eating
- Visit us online at **oldwayspt.org**


*Source: Kelly LeBlanc for Oldways*

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# Housekeeping

- Attendees will receive an email within ONE WEEK with **CPEU certificate**, **slides**, and **recording**
- Visit **oldwayspt.org/CPEU** to register for upcoming webinars or view recordings of previous webinars
- Please submit any questions using the Q&A function in Zoom
- *Stay tuned for news about upcoming webinars!*

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# Plant-Based Eating to Fight Diabetes

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# Disclosures

- Co-founder Food + Planet
- Nutrition Consultant Oldways
- Nutrition Consultant Tomato Products Wellness Council
- Nutrition Editor Today's Dietitian
- Adjunct Faculty, Prescott College

# A little bit about me...

*My father's farm in Idaho, Sharon Palmer*

*In my garden in Ojai, Sharon Palmer*

# Picture Perfect Diet for Diabetes

- What's the picture perfect diet to help fend off and treat diabetes, and reduce complications?
- The latest science says it's a diet lush with plants in every color, texture, and classification!
- Including a rainbow of vegetables and fruits, whole grains, pulses, nuts and seeds, spices and herbs.
- Major health organizations (ADA, AND, CDC, Harvard) recommending plant-based approach for diabetes

*Ojai farmers market, Sharon Palmer*

# Plant-Based Eating for Diabetes

“Healthful plant-based diets, rich in vegetables, fruits, whole grains, beans, lentils, nuts, and seeds, are powerful for lowering the risk of type 2 diabetes. Moreover, for people who already have type 2 diabetes, a healthful plant-based diet can not only improve blood sugar and potentially reduce the need for medications, but it can lower blood pressure, cholesterol, inflammation, and the risk of serious complications such as heart disease and kidney disease,” Michelle McMacken, MD, FACP, DipABLM, Executive Director, Nutrition & Lifestyle Medicine, NYC Health + Hospitals, Associate Professor of Medicine, NYU Grossman School of Medicine, Attending Physician, Adult Primary Care Center, and NYC Health + Hospitals/Bellevue.

# Lifestyle is Powerful

- Research shows diet & physical activity have the power to prevent or delay type 2 diabetes, put type 2 into remission, manage type 1 and type 2 diabetes once it occurs, and reduce the risks for other chronic diseases and complications that come along with diabetes.
- The landmark Diabetes Prevention Program found that lifestyle changes alone reduced the risk of type 2 diabetes in older adults by 71%.

*Asparagus Tofu Quiche, Sharon Palmer*

# Diabetes Conditions

| Condition | Definition | Risk factors |
|---|---|---|
| Prediabetes | Blood sugar level are higher than normal, but not high enough to be diagnosed with type 2 diabetes. Cells in body do not respond normally to insulin. | Prediabetes, overweight, 45 years or older, family history, physical inactivity, gestational diabetes, ethnic background (African America, Hispanic, Native American, Asian American) |
| Type 1 Diabetes | Pancreas does not make enough insulin, which helps blood sugar enter cells of your body. Blood sugar builds up in bloodstream, damaging the body. | Family history, more likely to develop as child, teen, young adult, ethnic background (White) |
| Type 2 Diabetes | Cells in body don't respond normally to insulin, thus the pancreas makes more insulin to respond. Eventually, pancreas can't keep up and blood sugar rises, causing damage to the body. | Prediabetes, overweight, 45 years or older, family history, physical inactivity, gestational diabetes, non-alcoholic fatty liver disease, ethnic background (African America, Hispanic, Native American, Asian American) |
| Gestational Diabetes | Develops during pregnancy in women who do not already have diabetes. The body can not make enough insulin during pregnancy. | Gestational diabetes during previous pregnancy, birth to baby 9 pounds or more, overweight, 25 years or older, family history, PCOS, ethnic background (African America, Hispanic, Native American, Asian American) |

Source: CDC

# Digging into the Science

- AHS-2: more plant-based the diet, the better in protection against T2DM; vegans 77% lower risk, vegetarians 54% lower risk, compared to non-veg
- EPIC-Oxford Study: vegetarians & vegans lower risk of diabetes compared to regular meat eaters
- India study: vegetarian diets linked with lower diabetes risk compared to non-vegetarian diets
- Taiwan study: strong protective effect for vegetarian diet patterns, compared to non-vegetarian diets

*Curried Lentil Dip, The Plant-Powered Plan to Beat Diabetes, Sharon Palmer*

# More Science…

- Scientific review, with evidence from nine nutrition studies that included more than 300,000 people, pointed out that people who ate a mostly plant-based diet reduced their risk of diabetes by 23%
- Research shows that if you eat a more healthful form of a plant-based diet—less refined and focusing on whole plant foods—you can improve your odds of beating diabetes even more

*Broccoli Leek Soup, The Plant-Powered Plan to Beat Diabetes, Sharon Palmer*

# Plant-Based Health Bonus

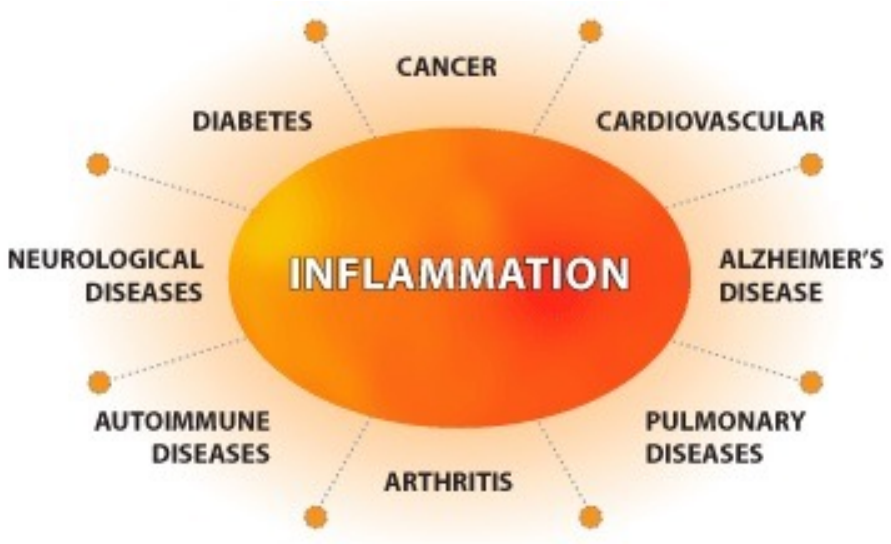
- Lower body weight
- Lower blood glucose levels
- Lower blood cholesterol and triglyceride levels
- Lower blood pressure
- Lower inflammatory levels
- Reduced risk of type 2 diabetes
- Reduced risk of cardiovascular disease
- Reduced risk of hypertension
- Reduced risk of stroke
- Reduced risk of certain types of cancer
- Reduced risk of obesity
- Reduced risk of Alzheimer's disease

*Ambrosia from The Plant-Powered Plan to Beat Diabetes, Sharon Palmer*

# Diabetes Health Connection

Two main threads connect diabetes with other chronic diseases:

- Obesity
- Inflammation




**Health Consequences of Obesity**

- Death
- Hypertension
- High cholesterol
- High triglycerides
- Type 2 diabetes
- Coronary heart disease
- Stroke
- Gallbladder disease
- Osteoarthritis
- Sleep apnea
- Many types of cancer
- Low quality of life
- Mental illness
- Body pain

**(CDC)**

# Weight & Inflammation

- Women BMI of 30 = 28 X higher risk of diabetes; BMI of 35 = 93 X higher risk, compared to normal BMI levels
- Extra body fat = higher levels of hormones and inflammation, feeding into insulin resistance
- Inflammation at foundation of chronic diseases, including diabetes
- Chronic cycle; inflammation and overweight feeds into diabetes, fueling development of diseases in tissues and organs of body
- Linked to metabolic syndrome (high blood pressure, blood glucose, waist circumference, cholesterol, triglyceride)

*Butternut Squash, Brussels Sprouts, Farro, Sharon Palmer*

# Diet Type 2 Diabetes Connection

- Evidence linking high intake of soft drinks, red meat, sweets, and fried foods to developing T2DM
- Fruits, vegetables—rich in nutrients, fiber, phytochemicals—may protect against developing T2DM + management
- Self dietary management is key for people with diabetes in relation to nutrition, tx, meds, and complications (ADA)

*Beluga Lentil Bowl, The Plant-Powered Plan to Beat Diabetes, Sharon Palmer*

# Managing Diabetes

- Plant-based eating found to improve diabetes management, reduce complications, and reduce the need for medication in research
- Plant-based eating, in particular vegan diets, can improve ABCs of diabetes: A1c, blood pressure, blood cholesterol, body weight, waist circumference, according to science
- Analysis with 6 RCTs found vegetarian diets linked with 0.4% greater reduction in HbA1C, compared to standard prescribed diabetes diets

*Cauliflower Lentil Curry Salad, Sharon Palmer*

# Prevent Complications

- Type 1 and 2 diabetes can result in consequences that affect health, productivity, quality of life
- 63% suffer from hypertension
- 56% have dyslipidemia
- 18% are obese
- More than half die of CVD, especially heart disease and stroke
- Raises risk for Alzheimer's and certain cancers
- Can damage organs like kidneys, eyes, nerves; major cause of blindness and lower limb amputation

*Berry Quinoa Bowl, Sharon Palmer*

# Protect Your Heart

- Studies show up to 32% reduction in ischemic heart disease with vegetarian diet patterns
- Dean Ornish lifestyle program lower LDL by 20% without medication, decrease plaque buildup in heart arteries by 7.9%, reduce cardiac events by 60%
- Neal Barnard, MD research vegan diets improve beta cell function, insulin resistance, blood glucose, and cholesterol; T2DM able to get off oral meds/insulin after 25 days on program

*Breakfast Tempeh Salad, California Vegan, Sharon Palmer*

# …There's More!

- Vegan diets linked with half the rate of hypertension compared to non-vegetarian diets
- LDL cholesterol 35% lower in plant-based eaters
- Lower levels of inflammatory markers
- Diabetic neuropathy significantly improved with plant-based diet, per research
- Protection from kidney disease attributed to plant-forward diet

*Carrot Fennel Soup, Sharon Palmer*

# What's So Great About Whole Plant Foods?

**High in the healthy stuff:**
fiber, vitamins, minerals, healthy fats, phytochemicals, low glycemic carbs
**Low in the unhealthy stuff:**
saturated fat, dietary cholesterol, sodium, toxins (nitroso compounds, heterocyclic amines, polycyclic aromatic hydrocarbons, glycation end products formed in cooking, curing, processing meats), heme iron

*Beet Fennel Sandwich, The Plant-Powered Plan to Beat Diabetes, Sharon Palmer*

# Plant-Based Benefits

*Plants work individually and synergistically*

- Higher fiber
- Lower heme iron
- Fewer calories
- Less saturated fat
- Less dietary cholesterol
- Higher intake phytochemicals

- Lower inflammatory markers
- Healthier weight
- Better glucose control
- Reduced levels of inflammation
- Greater insulin sensitivity
- Lower risk of disease development & progression

*Blueberry Buckwheat Bowl, Sharon Palmer*

# Promoting Insulin Sensitivity

- Plant foods (fiber, phytochemicals, antioxidants, magnesium) promote insulin sensitivity
- Help protects beta cells in pancreas, lowers body weight and waist circumference, reduces blood pressure, cholesterol, inflammation

*Chickpea Curry, Sharon Palmer*

**At Risk for Insulin Resistance**

- Overweight or obesity
- Age 45 or older
- Family history of diabetes
- Ethnic background (African American, Native American, Asian American, Hispanic, Pacific Islander)
- Low physical activity
- High blood pressure
- Abnormal blood cholesterol levels
- History of gestational diabetes
- History of heart disease or stroke
- PCOS
- Metabolic syndrome
- Certain medications
- Hormonal disorders
- Sleep problems

Source: NIH

# Anti-Inflammatory Eating

- Plants are rich in phytochemicals
- Fight inflammation and oxidative stress
- Lower inflammation levels linked with diet patterns rich in fruits, vegetables, whole grains, and nuts; higher inflammatory levels in refined eating styles, such as those high in red meat, refined starches, sugar, saturated fats
- More than 300,000 edible species of plants in the world, yet we only consume 150-200 species (FAO)

*Anti-Inflammatory Diet Pattern*

| Variety of foods | Healthful fats |
|---|---|
| Low in refined, low-nutrient foods | Includes omega-3 fatty acids |
| High in fruits and vegetables | Rich in antioxidant spices and herbs |
| Balanced in calories to promote optimal weight | Tea consumption |
| Healthful carbohydrates | Moderate consumption of red wine (if alcohol is consumed) |
| Low in animal proteins | Small amounts of dark chocolate (at least 70% cocoa) as a treat |
| Includes plant proteins such as pulses, soy foods, nuts | |

# Diabetes & the Gut

- Teaming environment of microbes in the gut performs multiple functions in body
- Influences metabolism, weight, insulin resistance, immune function, inflammation
- Plant-based diets linked with diverse, plentiful gut microbiome
- Profile: higher beneficial microbes & lower pathogenic microbes
- Diet rich in fibers found in plants produce SCFA

*Cauliflower Shawarma Bowl, The Plant-Powered Plan to Beat Diabetes, Sharon Palmer*

# Focus on Fiber

- Fiber = key reason for plant-based benefits
- Benefits: gut, immune system, weight, inflammation, glucose control, heart health, cancer, metabolic syndrome, satiety
- Low-fiber diets linked with T2DM; high-fiber diets with soluble fiber improve glucose control, decreases hyperinsulinemia, LDL cholesterol levels in people with type 2 diabetes
- CDC recommends fiber is important in managing diabetes because of blood glucose control, heart health, and weight benefits

*Spicy Garlic Edamame, The Plant-Powered Plan to Beat Diabetes, Sharon Palmer*

# Plants are Part of Indigenous, Traditional Diets


**Common Features:**

- Local whole grain
- Local legumes
- Seasonal cultivated and foraged fruits and vegetables
- Seeds and nuts
- Minimally processed
- Low use of animal foods



*Images: Produce in Tokyo, Japan; Quinoa in Sacred Valley, Peru; Produce stand Puerto Rico; local foods in Santorini Greece; tomatoes in Sicily, Sharon Palmer*

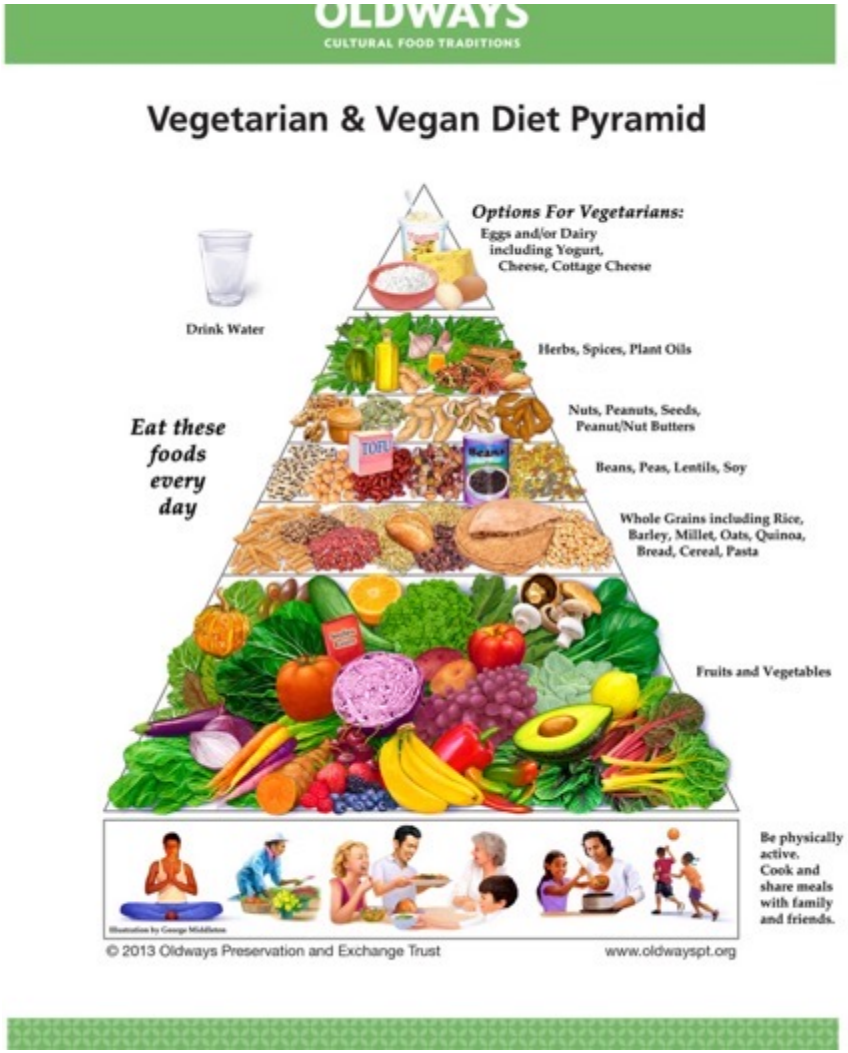
# Disease-Fighting Traditional Diets

- Traditional diets emphasize plants and have lower risks of chronic diseases, including T2DM
- Traditional Nordic diet (emphasis on fruits, vegetables, fish, whole grains, vegetable oils, with low red meat intake)
- Traditional Japanese diet (rich in soy foods, fruits, vegetables, fermented foods, green tea, fish, and low intake of animal fat and meat)
- Traditional Mediterranean diet (focus on beans, grains, vegetables, healthy fats, fish)
- Blue Zones (Ikaria, Greece, Okinawa Japan, Sardinia, Italy, Nicoya Costa Rica, and…Loma Linda, California) identified lower rates of diabetes (emphasize plant foods)

*Image: Swedish Pea Soup, Sharon Palmer*

# A Spectrum of Plant-Based Eating

| Vegan | Vegetarian (Lacto-Ovo Vegetarian) | Pescatarian | Semi-Vegetarian (or Flexitarian) |
|---|---|---|---|
| Excludes all animal foods, including animal flesh (red meat, poultry, fish/seafood), dairy products (cheese, butter, milk, yogurt, cream), and honey | Excludes all animal flesh (red meat, poultry, fish/seafood), but allows for dairy products (cheese, butter, milk, yogurt, cream), and honey | Excludes all red meat and poultry, but allows for fish/seafood, dairy products (cheese, butter, milk, yogurt, cream), and honey | Allows for small amounts of animal foods, including animal flesh (red meat, poultry, fish/seafood), dairy products (cheese, butter, milk, yogurt, cream), and honey |



# Quality Counts!

- Quality of plant-based diets in focus in research
- Refined plant-based diets not as health protective as minimally processed plant-based diets
- Highly processed junk plant foods: soda, chips, cookies, candy, white bread, refined crackers
- Quality: whole grains, pulses, soy foods, vegetables, fruits, nuts, seeds

*Farmers Market Tomato Arugula Salad, Sharon Palmer*

# Putting it Into Action

- Plant Proteins (Pulses, Nuts, Seeds, Soyfoods, Meat Alts)
- Whole Grains, Starchy Vegetables
- Vegetables (non-starchy)
- Fruits
- Healthy Fats
- Healthful Additions: Spices, Herbs, Dark Choc
- Healthful Hydration

*Gado Gado, Sharon Palmer*

# Key Plant Food Groups

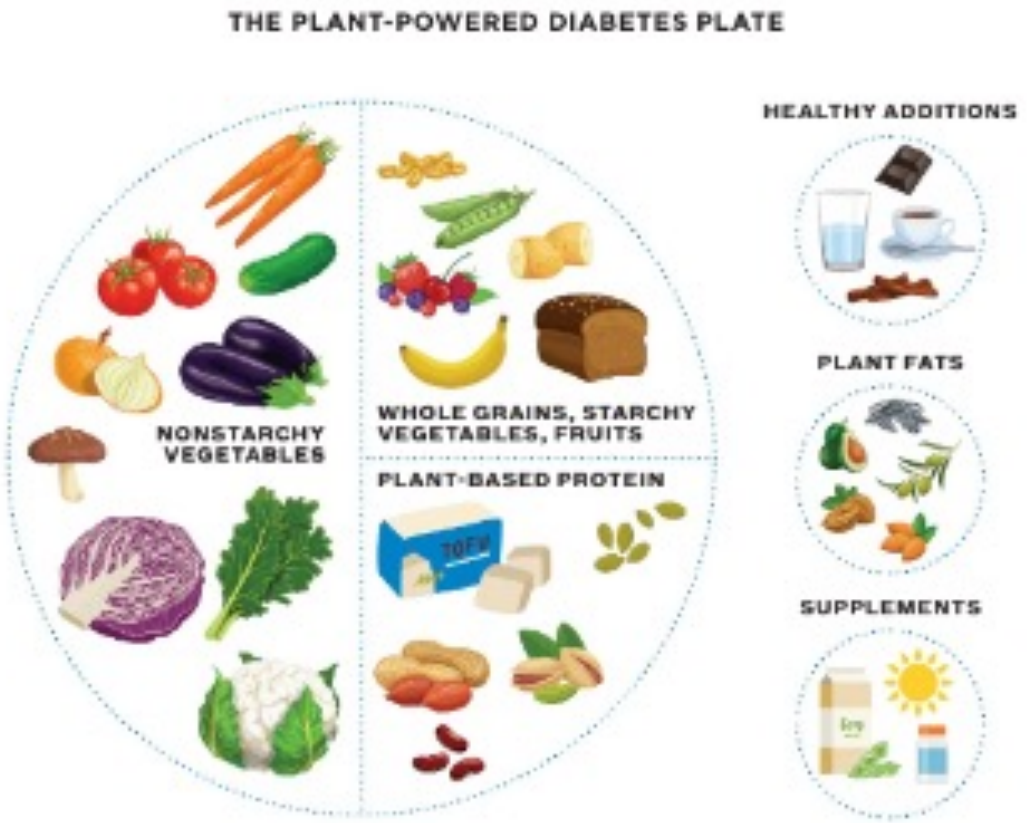
| Pulses: 15 grams of carbs per servings | Whole Grains: 15 grams of carbs per serving | Non-Starchy Vegetables: 5 grams of carbs per serving<br>Starchy Vegetables: 15 grams of carbs per serving | Fruits: 15 grams of carbs per serving | Fats: 0 grams of carbs per serving | Coffee, Tea, Herbs, Spices: 0 grams of carbs per serving<br><br>Dark Chocolate (15 grams of carbs per serving) |
|---|---|---|---|---|---|
| Serving Size:<br>½ cup cooked pulses, tofu, seitan, meat alternative<br>1 cup soymilk or yogurt<br>1 ounce nuts, seeds<br>2 tablespoons nut/seed butter | Serving Size:<br>½ cup cooked whole grains, whole grain breakfast cereal, pasta<br>1 slice whole grain bread<br>1 small tortilla | Serving Size:<br>Non-Starchy Vegetables:<br>½ cup cooked<br>1 cup raw<br><br>Starchy Vegetables:<br>½ cup cooked | Serving Size:<br>1 small whole fruit<br>½ cup chopped, frozen, canned (unsweetened)<br>3/4 cup berries<br>1 cup melon | Serving Size:<br>1/8th avocado<br>1 tablespoon nuts<br>10 small olives<br>1 teaspoon oil | Serving Size:<br>Coffee, tea, herbs, spices as desired<br><br>1 ounce dark chocolate |

# Super Vegetables

- Dark Green Leafy Vegetables: packed with vitamins A, C, E, and K, iron, calcium, potassium, phytochemicals
- Tomatoes: lycopene vitamin A, C, K; and potassium
- Mushrooms: special fibers, compounds, nutrients, bacteria, yeasts, and molds
- Cruciferous Vegetables: Broccoli, Brussels sprouts, cabbage, cauliflower, collard greens, kale, kohlrabi, mustard greens, rutabaga, turnips, bok choy, arugula, horseradish, radish, wasabi, and watercress. Possess folate, vitamin C, manganese, fiber, glucosinolates

*Vegan Cesar Salad, The Plant-Powered Plan to Beat Diabetes, Sharon Palmer*

# Plant-Powered Diabetes Plate Method



# Smart Snacking

Snack with protein, high-fiber carbs, no added sugars or grains

- Hummus with snow peas
- Nut butter with pear slices
- Protein-rich (at least 6 grams protein) plain plant-based yogurt with fresh berries
- Whole grain toast with tahini
- Small corn tortilla with baked tofu

*Olive Hummus, Sharon Palmer*

# Meet Nutrient Needs

- Calcium: (2-3 servings/day) tofu, tahini, cruciferous vegetables, pulses
- Vitamin D: sunshine, fortified foods, mushrooms
- B12: 250 mcg/day
- Iodine: seaweed, iodized salt
- Zinc: beans, nuts, whole grains
- Iron: beans, whole grains

*Lentil Walnut Bolognese, Sharon Palmer*

# Think Yes!

*"Plant-based diets, when planned properly can meet your nutritional needs, help you balance blood sugars, and manage diabetes. A well-executed plant-based meal, with whole grains for carbohydrate and energy, vegetables for vitamins and minerals, and dried beans, peas, lentils, nuts, and seeds for protein, is easy and delicious. Plant-based diets are high in fiber which helps maintain blood sugars," Madhu Gadia, MS, RD, CDE, plant-based diabetes expert.*

- 20,000 edible plant species in the planet
- Each with a story to help nourish and heal our bodies
- Start your plant-based journey!

*Beautiful Flower Salad with Rose Vinaigrette, Sharon Palmer*

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