Plant-Based Eating Patterns for Diabetes

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Associate Director of Diabetes Nutrition Education
The Physicians Committee for Responsible Medicine
Washington, DC
Objectives

• List various recommended eating patterns for diabetes.
• Discuss the benefits of plant-based nutrition for diabetes.
• Describe how to implement a plant-based eating in clinical practice
Diabetes Statistics

- 30.3 million have diabetes (9.4%)
- 84.1 million have pre diabetes (11.6%)
- $327 billion cost to US economy
- High intangible cost on society
Eating Patterns for Diabetes

- Mediterranean diet
- Dietary Approaches to Stop Hypertension (DASH)
- Low-carbohydrate diet
- Paleo diet
- Ketogenic diet
- Plant-based (vegetarian/vegan)

Vegetarian and Vegan Diets
Vegetarian Diets

- Vegan diet – 2%
- Vegetarian diet – 5%
“The Mediterranean, Dietary Approaches to Stop Hypertension (DASH), and plant-based diets are all examples of healthful eating patterns that have shown positive results in research....”

LIFESTYLE THERAPY
RISK STRATIFICATION FOR DIABETES COMPLICATIONS

INTENSITY STRATIFIED BY BURDEN OF OBESITY AND RELATED COMPLICATIONS

Nutrition
- Maintain optimal weight
  - Calorie restriction
- Plant-based diet; high polyunsaturated and monounsaturated fatty acids
- Avoid trans fatty acids; limit saturated fatty acids

Physical Activity
- 150 min/week moderate exertion (e.g., walking, stair climbing)
  - Strength training
  - Increase as tolerated

Sleep
- About 7 hours per night

Behavioral Support
- Community engagement
  - Screen for mood disorders

Smoking Cessation
- No tobacco products

Structured counseling
- Meal replacement
Structured program
- Medical evaluation/clearance
  - Medical supervision
Screen for obstructive sleep apnea
Refer to mental healthcare professional
- Behavioral therapy
Structured programs

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“...appropriately planned vegetarian, including vegan, diets are healthful, *nutritionally adequate*, and may provide health benefits in the prevention and treatment of certain diseases.”

Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems

“Food in the Anthropocene represents one of the greatest health and environmental challenges of the 21st century.”
Vegetarians have a Higher Diet Quality

Higher in:
- Fiber
- Vitamins A, C, E
- Calcium
- Magnesium
- Iron
- Thiamin
- Riboflavin
- Folate

Lower in:
- Calories
- Total and saturated fat
- Cholesterol
- Sodium
- Protein
- Vitamin B12
- Zinc
- Niacin

Vegetarians and Vegan Diets

Improve Risk Factors:
- Body weight
- Abdominal obesity
- Blood pressure
- Serum lipids
- Markers of inflammation
- Glucose levels

Reduce Risk of:
- Cardiovascular disease
- Diabetes
- Mortality
- Cancer
  - All
  - Colon
  - Prostate

7th Day Adventist

• Christian denomination
• Encouraged to be healthy
• Encouraged to be vegetarian (about 50% are)
• Sets up a natural experiment to evaluate eating patterns and health outcomes
  – Adventist Mortality Study (40% to 80% ↑DM risk)
  – Adventist Health Study 1
  – Adventist Health Study 2 - >100,000 (ages 30-112)

Adventist Health Study – 2 (N=60,903)

Controlled for BMI

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# Lacto-ovo Vs. Vegan AHS-2

<table>
<thead>
<tr>
<th></th>
<th>Lacto-ovo</th>
<th>Vegan</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>3 points lower</td>
<td>5 points lower</td>
</tr>
<tr>
<td>HTN</td>
<td>55% less</td>
<td>75% less</td>
</tr>
<tr>
<td>T2DM</td>
<td>38% to 61% less</td>
<td>49% to 78% less</td>
</tr>
<tr>
<td>All-Cause Mortality</td>
<td>9% lower</td>
<td>15% lower</td>
</tr>
<tr>
<td>CVD mortality</td>
<td>23% to 42% lower</td>
<td>55% lower</td>
</tr>
</tbody>
</table>

Meat Consumption and Diabetes

- Nurses Health Study I and II
- Health Professionals’ Follow up study
- European Prospective Investigation into Nutrition and Cancer
- NHANES

Sluijs et al. Diabetes Care. 2010;33:43-48
Intensive Lifestyle Intervention (NIH funded)

• 22 week RCT of 99 individuals with T2D:
  – Low-fat vegan group (N=49)
    • Consume from “4 food groups”
    • Avoid all animal produces
    • Low-fat, low glycemic index
  – **No portion control**
    – Control group (ADA: portion control of CHO, -500 kcal/day)
    – Both groups received intensive lifestyle therapy.

## Results at 22 weeks

<table>
<thead>
<tr>
<th></th>
<th>Vegan Group N=49</th>
<th>Control Group N=50</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Carbohydrate Intake</strong></td>
<td>Increased</td>
<td>Decreased</td>
<td></td>
</tr>
<tr>
<td><strong>Fiber intake</strong></td>
<td>Doubled</td>
<td>unchanged</td>
<td></td>
</tr>
<tr>
<td><strong>Reduced Medications</strong></td>
<td>43%</td>
<td>26%</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Change in A1C</strong></td>
<td>↓0.96</td>
<td>↓0.56</td>
<td>0.089</td>
</tr>
<tr>
<td><strong>Change in A1C (those w/o med △)</strong></td>
<td>↓1.23</td>
<td>↓0.38</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Body Weight</strong></td>
<td>↓6.5 kg</td>
<td>↓3.1 kg</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td><strong>Change in LDL</strong></td>
<td>↓22.6 mg/dl</td>
<td>↓10.7 mg/dl</td>
<td>0.02</td>
</tr>
<tr>
<td><strong>AHEI Score</strong></td>
<td>↑↑</td>
<td>unchanged</td>
<td>P&lt;0.0001</td>
</tr>
</tbody>
</table>
How is a plant-based diet (PBD) beneficial?
Potential Mechanisms: Effects on Insulin Resistance/ Beta-cell Function

**Plant-Based Diet**
- Diet Quality
- Fiber
- Antioxidants and Phytochemicals
- Low-GI
- Polyphenols
- Anti-inflammatory
- Vitamins/Minerals

**Animal-Based Diet**
- Saturated Fats and trans fats
- Heme-iron
- Protein
- AGE
- Dysbiosis
- Nitrates/Nitrites

**Insulin Resistance Beta-cell Dysfunction**

References:
Radulian G. Nutr J. 2009;8:5.
When compared with omnivores (matched for age, BMI, body fat, energy intake, etc.), vegans have lower intramyocellular content and higher insulin sensitivity.

A Plant-Based Dietary Intervention Improves Beta-Cell Function and Insulin Resistance in Overweight Adults: A 16-Week Randomized Clinical Trial

Hana Kahleova 1,*, Andrea Tura 2, Martin Hill 3, Richard Holubkov 4 and Neal D. Barnard 1,5

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3 Institute of Endocrinology, 11364 Prague, Czech Republic; mhill@endo.cz
4 School of Medicine, University of Utah, Salt Lake City, UT 84132, USA; richard.holubkov@hsc.utah.edu
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* Correspondence: hkahleova@pcrm.org; Tel: +1-202-527-7379

Received: 19 December 2017; Accepted: 5 February 2018; Published: 9 February 2018

Abstract: The aim of this study was to test the effect of a plant-based dietary intervention on beta-cell function in overweight adults with no history of diabetes. Participants (n = 75) were randomized to follow a low-fat plant-based diet (n = 38) or to make no diet changes (n = 37) for 16 weeks. At baseline and 16 weeks, beta-cell function was quantified with a mathematical model. Using a standard meal test, insulin secretion rate was calculated by C-peptide deconvolution. The Homeostasis Model Assessment (HOMA-IR) index was used to assess insulin resistance while fasting. A marked increase in meal-stimulated insulin secretion was observed in the intervention group compared with controls (interaction between group and time, Gx, p < 0.001). HOMA-IR index fell significantly (p < 0.001) in the intervention group (treatment effect -1.0 [95% CI, -1.2 to -0.8]; Gx, p = 0.004). Changes in HOMA-IR correlated positively with changes in body mass index (BMI) and visceral fat volume (r = 0.34, p = 0.001 and r = 0.42, p = 0.001, respectively). The latter reached significant...
PBD Improves Beta Cell Function

- 16 week dietary intervention
- N=75, overweight adults randomized to:
  - Low-fat vegan diet
  - No dietary changes
- Intervention results:
  - ↑ in post meal stimulated insulin secretion occurred in the LFV group (p < 0.001)
  - ↓ in insulin resistance (HOMA-IR) (p < 0.001)

A Plant-Based Meal Stimulates Incretin and Insulin Secretion More Than an Energy- and Macronutrient-Matched Standard Meal in Type 2 Diabetes: A Randomized Crossover Study

Hana Kahleova 1,2,* , Andrea Tura 3, Marta Klementova 1, Lenka Thieme 1, Martin Haluzik 1, Renata Pavlovicova 1, Martin Hill 4 and Terezie Pelikanova 3

1 Institute for Clinical and Experimental Medicine, 14021 Prague, Czech Republic; KMarta@seznam.cz (M.K.); belenka@volny.cz (L.T.); halm@ikem.cz (M.H.); renata.pavlovicova@ikem.cz (R.P.); tepe@ikem.cz (TP)
2 Physicians Committee for Responsible Medicine, Washington, 5100 Wisconsin Ave, NW, Suite 400, Washington, DC 20016, USA
3 Metabolic Unit, CNR Institute of Neuroscience, 35127 Padua, Italy; andrea.tura@cnr.it
4 Institute of Endocrinology, 11394 Prague, Czech Republic; mhill@endo.cz
* Correspondence: hkahleova@pcrm.org; Tel.: +1-202-527-7379

Received: 4 February 2019; Accepted: 21 February 2019; Published: 26 February 2019

Abstract: Diminished postprandial secretion of incretins and insulin represents one of the key pathophysiological mechanisms behind type 2 diabetes (T2D). We tested the effects of two energy- and macronutrient-matched meals: A standard meat (M-meal) and a vegan (V-meal) on postprandial incretin and insulin secretion in participants with T2D. A randomized crossover design was used in 20 participants with T2D. Plasma concentrations of glucose, insulin, C-peptide, glucagon-like peptide-1 (GLP-1), amylin, and gastric inhibitory peptide (GIP) were determined at 0, 30, 60, 120, and 180 min. Beta-cell function was assessed with a mathematical model, using C-peptide.
Diabetes & The “Incretin Effect”

Healthy Patients

Normal Incretin Effect

Type 2 Diabetics

Reduced Incretin Effect

![Graph showing](chart.png)

- **Oral Glucose (50 g/400 ml)**
- **Isoglycemic IV Glucose Infusion**

Vegan Sandwich VS. Meat Sandwich

- Macronutrient: 44% CHO, 20% protein, 39% fat
- Vegan meal increased **post prandial GLP-1 by 30.1%**
- Outcome similar to Sitagliptin

<table>
<thead>
<tr>
<th>Kind</th>
<th>Calories</th>
<th>Fiber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegan Sandwich</td>
<td>514.9 kcal</td>
<td>7.8 g</td>
</tr>
<tr>
<td>Meat Sandwich</td>
<td>513.6 kcal</td>
<td>2.2 g</td>
</tr>
</tbody>
</table>
Fiber is Filling

Fiber tells your brain $\rightarrow$ you’re full.

Carbohydrate has 4 calories/gram
Fat has 9 calories/gram

119 kcals
WHAT 500 CALORIES LOOKS LIKE

OIL

CHEESE

MEAT

GRAINS & BEANS

FRUITS & VEGGIES
Short Chain Fatty Acids (SCFA)

Non-digestible polysaccharides

Fermented by gut bacteria

SCFA:
- Butyrate
- Propionate
- Acetate

SCFA and Health

- Enhance nutrient absorption
- Improve gut barrier function

↓ Endotoxin
↓ Inflammation
↑ Release of gut peptides
↑ Glycemic control

↑ Satiety
↓ Food intake

↑ FOX

Conlon et al. Nutrients. 2015;7:17-44
The After-Meal Calorie Burn

The After-Meal Calorie Burn

Diabetes Remission Occurs with Calorie Restriction
Reversal of Diabetes

• Metabolic surgery
• Very-low-calorie diets
  – The Counterpoint Study – 640-700 kcal/d (50% remission)
  – Primary care-led weight management for remission of type 2 diabetes (DiRECT) – 825-853 kcal/d (46% remission vs 4% in control group)
  – Insulin sensitivity occurs within days
  – Beta cell function improves within weeks

Effect of High-Fiber, Low-Fat Diet Without Weight Loss

- N=20 men with T2DM on insulin
- Metabolic ward
  - Control diet 7 days
  - Near-vegetarian diet (70% carbohydrate, 65 g fiber) 16 days
- Designed to maintain body weight

Anderson JW. Am J Clin Nutr. 1979;32:2312-2321
Results

• No changes in body weight
• 9 out of 20 patients discontinued insulin
• Insulin was reduced: $26 \pm 3$ units/day to $11 \pm 3$ units per day ($P<0.001$)
• Fasting and 3-hour postprandial glucose levels decreased significantly
• Cholesterol was reduced: $206 \pm 10$ mg/dL to $147 \pm 5$ mg/dL ($P<0.001$)
• No significant increase in TG

Plant-Based Nutrition Summary

- Healthy weight
- Diet quality
- May restore beta-cell function
- High in fiber
- Incretin effect
- Healthy microbiota
- Enhances thermogenesis
Plant-Based Nutrition for Diabetes Implementation
Whole Grains 5-8 servings

- Intact grains: bran, endosperm, and germ
- Brown rice, wild rice, corn, oats, barley, rye, whole wheat, whole grain pasta, teff
- Pseudo grains: amaranth, quinoa, buckwheat, millet
Whole Grains

- ↓ Inflammation
- ↓ Body weight
- ↑ Insulin sensitivity
- ↓ T2DM risk

- ↓ Mortality (CV and DM)
- ↓ Cancer risk
- Improves microbiota: increases in healthy species and diversity
- Enhances the release of SCFAs

Legumes 2 + servings

- Nutrient dense
- Low glycemic index
- “Second-meal effect”
- Reduce adiposity

In 4.3 years of follow up, individuals in the highest quartile of legume and lentil consumption had a 35% lower risk of diabetes than those in the lowest quartile.
Fruits 3-4 servings
Vegetables 4-5 servings
Nuts and Seeds 1oz per day

- High in antioxidants
- High in polyphenols
- Source of essential fatty acids
- Inversely associated with diabetes

Principles of Plant-Based Nutrition

• Limit added vegetable oils and other high fat foods.
• Low glycemic index (GI) such as oatmeal, barley, quinoa, sweet potatoes, whole grains, rye or pumpernickel bread, beans, fruits, and vegetables.

Principles of Plant-Based Nutrition

- Avoid all animal products (e.g., meat, chicken, fish, eggs, all dairy)
- Take a Vitamin B12 supplement
- Choose high-fiber foods

<table>
<thead>
<tr>
<th></th>
<th>Fiber Intake (g/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Intake of Americans</td>
<td>15</td>
</tr>
<tr>
<td>Recommendations</td>
<td>25-38</td>
</tr>
<tr>
<td>Plant-Based Nutrition</td>
<td>40</td>
</tr>
</tbody>
</table>
Macronutrient Mix

- Vegan: CHO, 60% to 70%; Fat, 10% to 20%; Pro, 20%
- DASH: CHO, 53%; Fat, 27%; Pro, 20%
- PWD: CHO, 45%; Fat, 38%; Pro, 17%
- Medit: CHO, 38%; Fat, 46%; Pro, 16%
- LCD: CHO, 30%; Fat, 43%; Pro, 27%
- Ketogenic: CHO, 11%; Fat, 69%; Pro, 20%

References:
Low-Carbohydrate/High-Fat Diets

- Short term studies show significant ↑ in post prandial glucose (OGTT) compared to a low fat diet (69% vs. 22%).
- Prospective studies show ↑ in CVD and all-cause mortality.
- Fat displaces high-fiber foods, ↓ quality.
- Increases proinflammatory species in gut

Shouldn’t we limit carbohydrate consumption in diabetes?
Rice and Rye in Asia

Corn and Sweet Potatoes in North, Central, and South America

Barley, Oats, Wheat in Middle and Far East

Millet and Sorghum in Africa

Legumes in America, Europe, and Asia

Rice and Rye in Asia

Historical Eating Patterns
Unrefined vs. Refined Carbohydrates

High in fiber, micronutrients, phytochemicals, and water

Highly processed, low in fiber, micronutrients, and phytochemicals
Okinawa Longevity Diet

- 70% Sweet potatoes (carbs)
- 12% Rice
- 7% Grains & Wheat
- 6% Soy & legumes
- 4% Additional vegetables
- 3% Fruit
- 2% Oils
- 1% Nuts (Protein)
- 1% Other potatoes
- 1% Seaweed
- 1% Sugars
- 1% Fish
- 1% Dairy
- 1% Eggs
- 1% Pork Meat
- 1% Flavorings & Alcohol

- 85% carbs
- 09% Protein
- 06% Fat
- 85-10-5

1785 Calories


Note: These are the Actual Food Measurements of the Centenarians, not the diet of All island Okinawans or the ones who died, but the ones who lived.
Blue Zones

- Lomo Linda, USA
- Nicoya, Costa Rica
- Sardinia, Italy
- Ikaria, Greece
- Okinawa, Japan
Blue Zones

“Power 9®”
1. Move naturally
2. Purpose
3. Downshift
4. 80% Rule
5. Plant slant
6. Wine at 5
7. Belong
8. Loved ones first
9. Right tribe

Buettner D, Skemp S. Blue Zones: Lessons from the world’s longest lived. 2016.
https://doi.org/10.1177%2F1559827616637066
Case Study
Pre Plant-Based Diet

Diagnosed with Type 2 DM in 2002

Medications (2011)
Lantus, Simvastatin, Lisinopril, Metformin, and Januvia

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Total Cholesterol (mg/dL)</td>
<td>164</td>
<td>104</td>
</tr>
<tr>
<td>Triglycerides (mg/dL)</td>
<td>192</td>
<td>111</td>
</tr>
<tr>
<td>HDL-C (mg/dL)</td>
<td>39</td>
<td>38</td>
</tr>
<tr>
<td>LDL-C (mg/dL)</td>
<td>87</td>
<td>44</td>
</tr>
<tr>
<td>A1C (%)</td>
<td>10.5</td>
<td>8.1</td>
</tr>
</tbody>
</table>

PBD 12/3/11
Changes after 26 days
2011 to 2019

- Lost 50 lbs
- A1C=5.5%
- Medication-free
Marc’s Key to Success:
- 4 food groups
- No animal product
- Low-fat
- Low GI foods

http://www.chickpeaandbean.com/
Meal Planning for Success
Test Driving a Plant-Based Diet

• Introduce during your assessment
• Ease into it slowly/Spectrum approach
• 3-week trial of 100% plant-based eating:
  – Take 2 weeks to plan and try meatless meals and learn a few new recipes
  – Short-term commitment
  – Motivating results
Foods to Try

Breakfast

Lunch

Dinner

Snacks
Healthy Breakfasts
Lunches and Dinners
Phase 1  Dates: ___________ to ___________

In Phase 1, you’ll focus on the basics: fruits, vegetables, and beans. These foods have lots of fiber that lowers blood glucose and helps you to lose weight.

Check off the items as you go. Get at least the indicated number of servings each day for each group. You can eat other foods and beverages too, but be sure to get these foods, plus exercise, in the recommended amounts every day.

<table>
<thead>
<tr>
<th></th>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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</thead>
<tbody>
<tr>
<td>Fruit</td>
<td></td>
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<tr>
<td>(1 medium-sized fruit or 1 cup cut)</td>
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<td>☐ ☐</td>
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<td>☐ ☐</td>
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<tr>
<td>Vegetables</td>
<td></td>
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<tr>
<td>(1 cup raw, large pieces; ½ cup chopped raw or cooked)</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
<td>☐ ☐</td>
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<tr>
<td>Beans &amp; lentils</td>
<td></td>
<td></td>
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<tr>
<td>(½ cup cooked beans, lentils)</td>
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<td>☐</td>
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<tr>
<td>Water</td>
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<tr>
<td>(One 12-ounce glass)</td>
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<td>Exercise</td>
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<td>(30 minutes, 3+ days/week)</td>
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</tbody>
</table>
Phase 2  Dates: _____________ to _____________

In Phase 2, you’ll add berries and leafy greens to your daily routine.

Berries are incredibly rich sources of anthocyanins, compounds that fight diabetes, cancer, and inflammation. Dark green leafy vegetables are the healthiest foods on the planet.

<table>
<thead>
<tr>
<th></th>
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<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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</thead>
<tbody>
<tr>
<td>Berries (¼ cup fresh or frozen)</td>
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<td>Other fruit (1 medium-sized fruit or 1 cup cut)</td>
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<tr>
<td>Leafy greens (1 cup raw; ½ cup cooked)</td>
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<tr>
<td>Other vegetables (1 cup raw, large pieces; ¼ cup chopped raw or cooked)</td>
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<tr>
<td>Beans &amp; lentils (¼ cup cooked beans, lentils)</td>
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<td></td>
<td></td>
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<tr>
<td>Water (One 12-ounce glass)</td>
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<tr>
<td>Exercise (30 minutes, 4+ days/week)</td>
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</tbody>
</table>

For use with permission of Peggy Kraus, CDE, RCEP  Erasing Diabetes — winning without meds
Phase 3 Dates: ____________ to ____________

You're doing great! You're ready for the final additions: cruciferous vegetables, whole grains, and ground flax seeds.

Oatmeal, brown rice, and whole grain pasta can fill you up and keep you satisfied because they are terrific sources of fiber. Sprinkle ground flax seeds on your oatmeal or salad. They'll help to fill you up and help protect against cancer too.

<table>
<thead>
<tr>
<th></th>
<th>Sunday</th>
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<th>Tuesday</th>
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<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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</thead>
<tbody>
<tr>
<td>Berries</td>
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<tr>
<td>(1/4 cup fresh or frozen)</td>
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<tr>
<td>Other fruit</td>
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<tr>
<td>(1 medium-sized fruit or 1 cup cut fruit)</td>
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<tr>
<td>Leafy greens</td>
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<tr>
<td>(1 cup raw; 1/2 cup cooked)</td>
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<td>Cruciferous vegetables</td>
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<tr>
<td>(1/4 cup chopped, 1 tbsp horseradish)</td>
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<td>Other vegetables</td>
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<tr>
<td>(1 cup raw; 1/2 cup chopped raw/cooked)</td>
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<tr>
<td>Beans &amp; lentils</td>
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<tr>
<td>(1/4 cup cooked beans, lentils)</td>
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<td>Whole grains</td>
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<tr>
<td>(1/4 cup cooked grains, hot cereal; 1 cup cold cereal; 1 slice bread)</td>
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<tr>
<td>Flax seeds</td>
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<tr>
<td>(1 tbsp ground)</td>
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<td>Water</td>
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<td>(One 12-ounce glass)</td>
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<td>Exercise</td>
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<td>(30 minutes, 5+ days/week)</td>
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</tbody>
</table>

For use with permission of Peggy Kraus, CDE, RCEP  Erasing Diabetes — winning without meds
B12 Recommendations

• Fortified foods contain B12
• Vegans should have a reliable source:
  – 500 to 1,000 µg several times per week
  – Based on 1% (passive) absorption

Vitamin B12

• B12 Deficiency:
  – Elevated homocysteine: CVD risk
  – Macrocytic anemia: fatigue
  – Nerve damage: tingling in fingers and toes
  – Poor cognition, digestion, FTT
  – Stroke, dementia, and poor bone health

• Metformin is associated with vitamin B12 deficiency: periodic testing is recommended.

Diabetes Care 2018;41:S1-159.
What Should Patients Expect?

• Blood glucose changes:
  – Hypoglycemia – review prevention, recognition, and treatment
  – Slow decrease in glucose over time
  – Hyperglycemia – focus on low-GI carbohydrates

• Reduction in blood pressure
• Reduction in cholesterol
• Medication changes may be needed
Why Do People Like It?

• No portion sizes
• No carbohydrate counting – except in T1D
• Major health benefits – addresses root cause
• Saves money
Websites and Books

- NutritionCME.org
- ForksOverKnives.com
- NutritionFacts.org
- https://www.pcrm.org/
Being a Healthy Role Model

• Problem-solving
• Social support
Today’s Recipes

Yes You Can Black Bean Chili

Taste of Asia Cole Slaw

Tofu Scramble
Q & A
Thank you!