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**SCHOOL OF PUBLIC HEALTH**



Nutritional Sciences  
UNIVERSITY OF TORONTO

# **Dietary Patterns and Risk of Type 2 Diabetes in the Women's Health Initiative**

**Andrea J. Glenn, MSc RD PhD**

Registered Dietitian & Postdoctoral Research Fellow

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# Diet is Important for Chronic Disease Prevention, including Diabetes



- *The style of eating that works well for diabetes may be described as Mediterranean, Nordic, DASH or vegetarian style diets.*



- *Adopt a healthy dietary pattern to lower CVD risk: Mediterranean, Portfolio, DASH, vegetarian*



- *Heart healthy dietary patterns include Mediterranean, DASH, Healthy US and healthy vegetarian style diets*



- *Lifestyle modification: Mediterranean or DASH style*

Sievenpiper et al. Can J Diabetes. 2018;42 (Suppl 1):S64-S79.

Anderson JT et al. Can J Cardiol. 2016;pii:S0828-282X(16)30732-2.

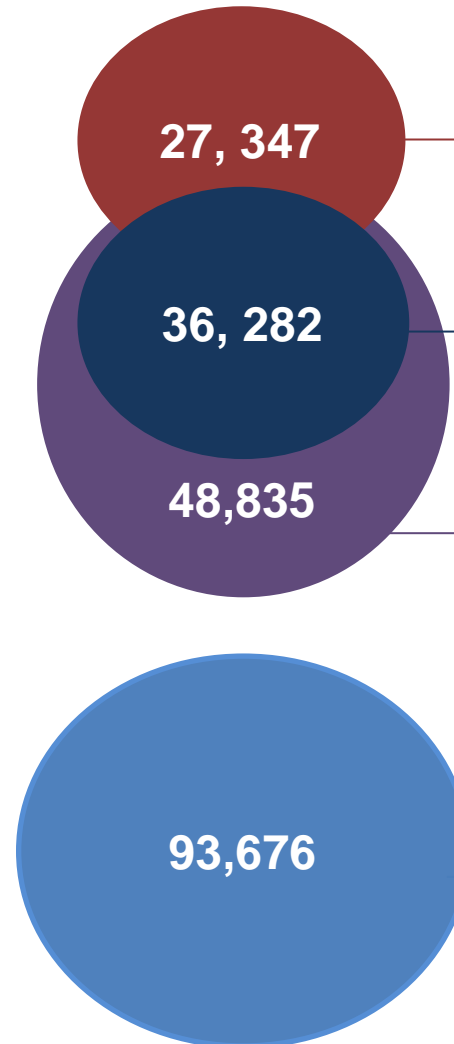
Grundy SM. Circulation 2019;139:e1082-e1143

American Diabetes Association. Diabetes Care 2020;43(Suppl. 1):S48-S65

# The Portfolio, Mediterranean, and DASH Diets and Risk of Type 2 Diabetes



Glenn et al. *Diabetes Care*, 2023; 46(1):28-37



**Hormone Therapy Trial:**  
Coronary Heart Disease & Fractures  
Adverse Effect for Breast Cancer

**Calcium & Vitamin D Trial:**  
Fractures & Colorectal Cancer

**Dietary Modification Trial:**  
Breast & Colorectal Cancer  
& Coronary Heart Disease

**Observational Study**

**N = 161,808 postmenopausal women**

# — THE — PORTFOLIO DIET

*An evidence-based eating plan for lower cholesterol*





## WHAT DOES THE PORTFOLIO DIET LOOK LIKE?

### 1 NUTS & SEEDS, 45 g DAILY

All nuts & seeds are good for your heart and cholesterol and contrary to concerns, do not contribute to weight gain. Try having nuts or seeds as a snack between meals, or try adding them to salads, cereals, or yogurt. Try nut butter on your toast as another option. 45 g is about a handful of nuts. If you are allergic to peanuts, or tree nuts, try seeds.



### 2 PLANT PROTEIN, 50 g DAILY

Plant protein is becoming the easy option. It's a way to take action for your heart and the planet. Start by trying to get 10 g daily which could look like 1 ¼ cup soymilk, ½ cup chickpeas, ⅓ cup ground soy, or ½ big veggie burger. You could also try ½ cup edamame. Try replacing cow's milk with silky soymilk, ground beef with hearty ground soy or lentils, or meat with tasty tofu strips in a stir-fry.



### 3 VISCOUS (STICKY) FIBRE, 20 g DAILY

Choose bread and cereals high in oats, barley, and/or psyllium to get your viscous fibre (2-4 g per slice of bread or 4-6 g per cup of dry cereal). Emphasize specific fruits (apples, oranges, berries, persimmons) and vegetables (eggplant, okra) (1-2 g per serving). The easiest way to add viscous fibre is a supplement (psyllium, PGX, pectin). Try adding 1-2 tsp of a psyllium product to water or pure psyllium husk to smoothies, soy yogurt, or apple sauce (2-4 g per tsp).



### 4 PLANT STEROLS, 2 g DAILY

These occur naturally in plant foods (e.g. nut, soybeans, peas, canola oil) but to get this amount will require a supplement or fortified foods like spreads, juices, or yogurts.



### 5 OILS (MUFAs), 45 g DAILY

Try heart-healthy oils rich in monounsaturated fatty acids (MUFAs). Extra-virgin olive oil should be the first choice. Other choices include canola, soybean, or "high-oleic" sunflower and safflower oils. Aim for "extra-virgin" or "cold-pressed" oils (15 g per 1 tbsp of oil). Avocados are also an excellent source of MUFAs (9 g per ¼ fruit).



Expected LDL-cholesterol lowering

Endorsed for heart health\*

5-10 %

5-10 %

5-10 %

5-10 %

5-10 %<sup>†</sup>



TOTAL: ~30%



Health  
Canada

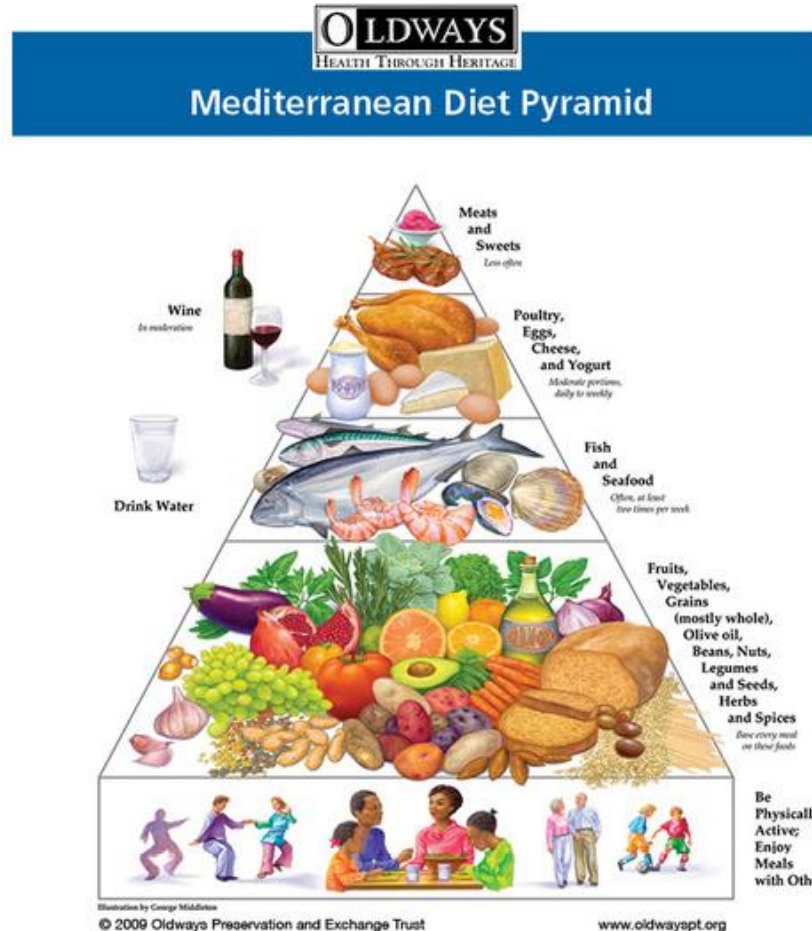
Santé  
Canada



U.S. FOOD & DRUG  
ADMINISTRATION



# The Mediterranean Diet



















*“A **Mediterranean diet** primarily refers to a plant-based diet first described in the 1960s. General features include **high** consumption of **fruits, vegetables, legumes, nuts, seeds, cereals and whole grains**; **moderate-to-high** consumption of **olive oil** (as the principal source of fat); **low-to-moderate** consumption of **dairy products, fish and poultry**; **low** consumption of **red meat**; and low-to-moderate consumption of **wine**, mainly during meals.”*

<https://oldwayspt.org/traditional-diets/mediterranean-diet>

# Dietary Approaches to Stop Hypertension (DASH) Diet

*The DASH diet was originally developed to lower blood pressure*

**The Benefits:** Lowers blood pressure & LDL “bad” cholesterol.


 <b>Eat This</b>	 <b>Limit This</b>
 Vegetables	 Fatty meats
 Fruits	
 Whole grains	 Full-fat dairy
 Fat-free or low-fat dairy	
 Fish	 Sugar sweetened beverages
 Poultry	
 Beans	 Sweets
 Nuts & seeds	
 Vegetable oils	 Sodium intake

# Adherence to Dietary Patterns was assessed using the Food Questionnaire

Form 60 OMB #0925-0414 Exp: 4/06

**FOOD QUESTIONNAIRE**

WOMEN'S HEALTH INITIATIVE



Name \_\_\_\_\_

Date \_\_\_\_\_

Public reporting burden for this collection of information is estimated to average 40 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: NIH, Project Clearance Branch, 6705 Rockledge Drive, MSC 7974, Bethesda, MD 20892-7974, ATTN: PRA (0925-0414). Do not return the completed form to this address.

**OFFICE USE ONLY**

1. Date Completed:

Month Day Year M D Y

2. Reviewed By:

3. Contact Type:

Phone  
Mail  
Visit  
Other

4. Visit Type:

Screening  
Semi-Annual  
Annual  
Non Routine

5. Form Administration:

Self  
Group  
Interview  
Assistance

6. Language:

☒ E ☐ S

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- Foods were put into different categories based on each dietary pattern and everyone received a score for each dietary pattern
- Portfolio: 6-30 points
- DASH: 8-40 points
- Mediterranean: 0-9 points

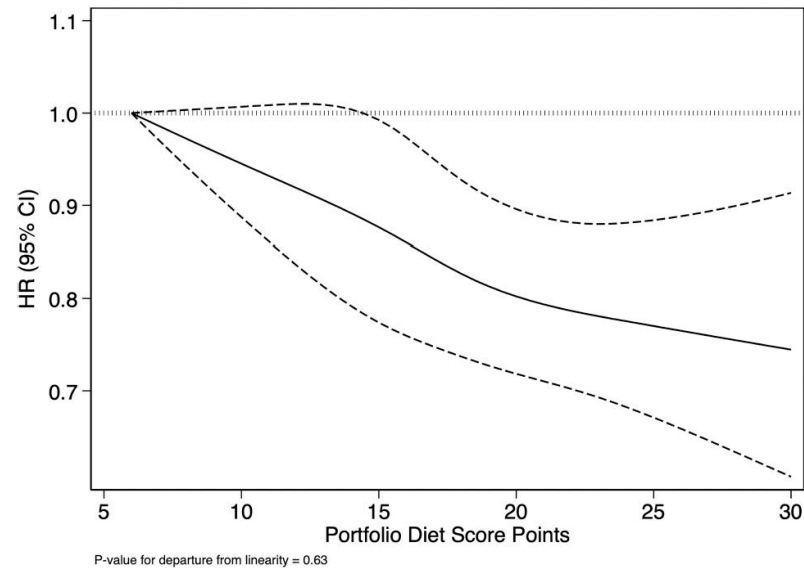
# All Three Dietary Patterns were Associated with a Similar Lower Risk of Diabetes

	Q1 HR (95% CIs)	Q2 HR (95% CIs)	Q3 HR (95% CIs)	Q4 HR (95% CIs)	Q5 HR (95% CIs)	Per 1-SD increase	Trend p-value	
Portfolio	1.00 [ref]	0.99 (0.94, 1.04)	0.94 (0.89, 0.99)	0.88 (0.83, 0.94)	0.87 (0.82, 0.93)	0.94 (0.93, 0.96)	<0.001	13% ↓ risk
DASH	1.00 [ref]	0.93 (0.88, 0.98)	0.88 (0.84, 0.93)	0.81 (0.77, 0.86)	0.78 (0.72, 0.83)	0.92 (0.90, 0.93)	<0.001	22% ↓ risk
Mediterranean	1.00 [ref]	0.99 (0.94, 1.05)	0.97 (0.92, 1.02)	0.93 (0.88, 0.99)	0.88 (0.83, 0.94)	0.94 (0.93, 0.96)	<0.001	12% ↓ risk

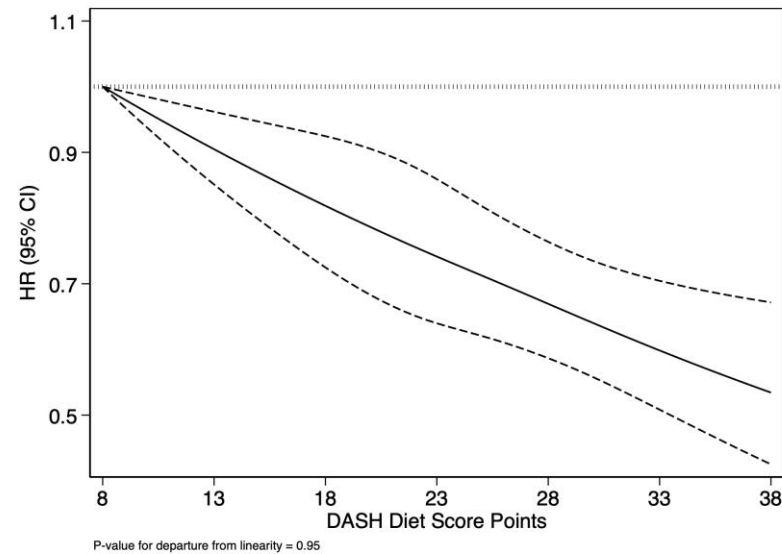
Adjusted for age, region, smoking status, study arm, ethnicity, education, marital status, physical activity, alcohol intake, energy intake, hypertension status, family history of diabetes, hormone therapy use, cholesterol lowering medication use, BMI

# The More Foods Eaten from Each Dietary Pattern, the Lower the Risk of Type 2 Diabetes

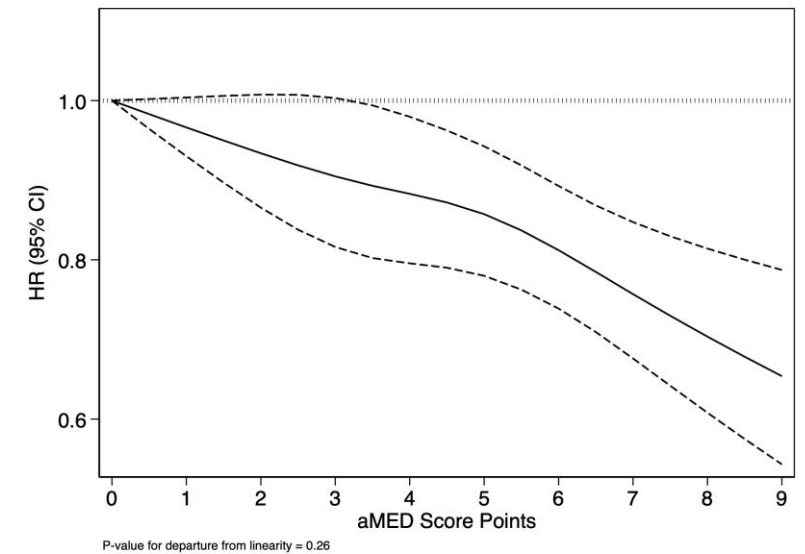
*The Portfolio Diet*



*The DASH Diet*



*The Mediterranean Diet*



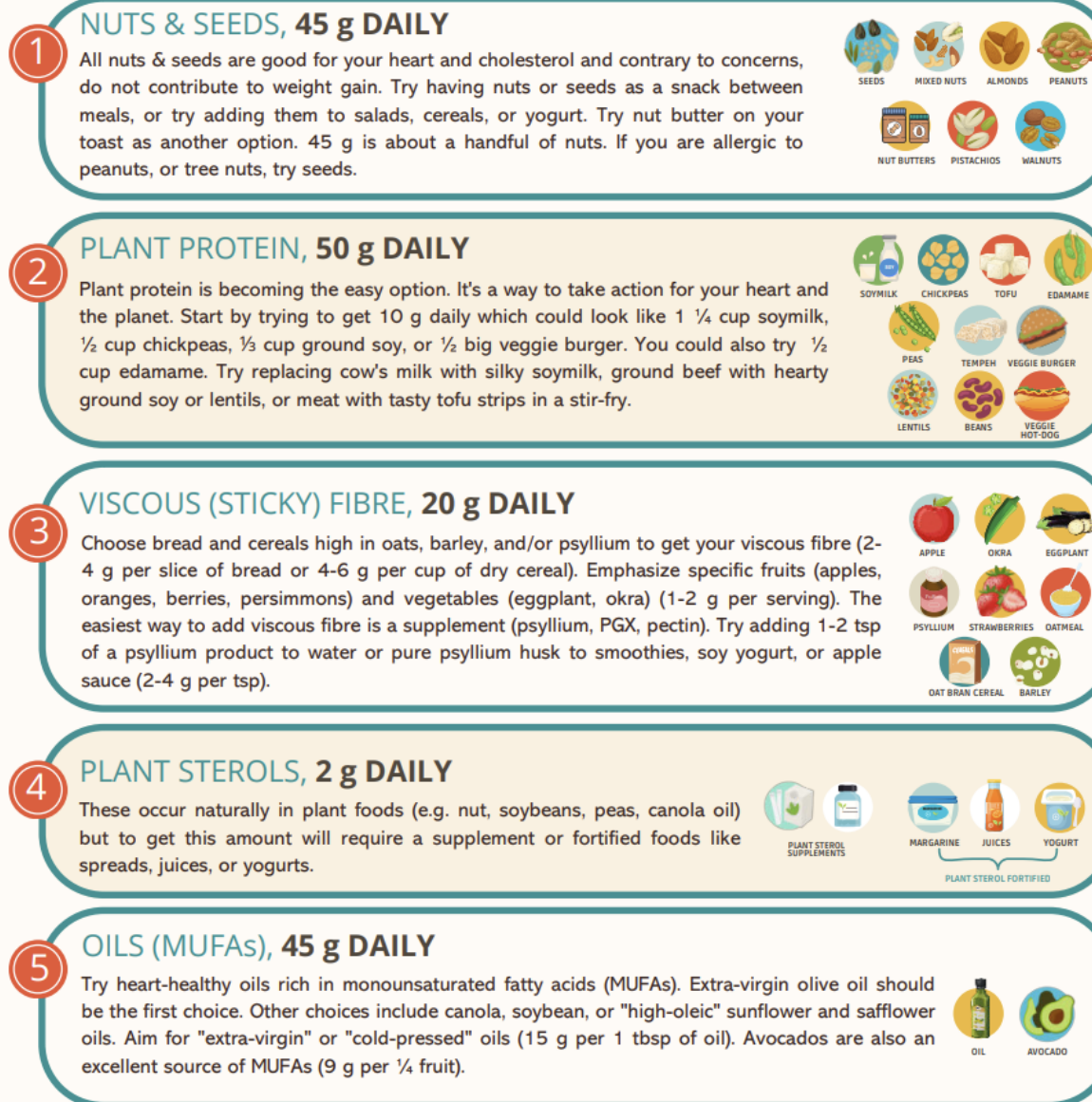
# What Did We Learn From This Study?

- All three dietary patterns resulted in a similar lower risk of developing type 2 diabetes
- Even small changes to include more foods from the dietary patterns may lower your risk of type 2 diabetes
- Findings align with current clinical practice guidelines for diabetes: Choose the dietary pattern based on values and preferences and that you can stick with in the long-term

IT'S NOT ABOUT ONE BIG CHANGE. IT'S NOT ALL OR NOTHING.  
JUST START BY INTRODUCING ONE COMPONENT  
TO YOUR DIET AND BUILD FROM THERE.

# Where can I learn more about the Portfolio Diet?

## WHAT DOES THE PORTFOLIO DIET LOOK LIKE?



**TOTAL:** ☑ ~30%

1 <

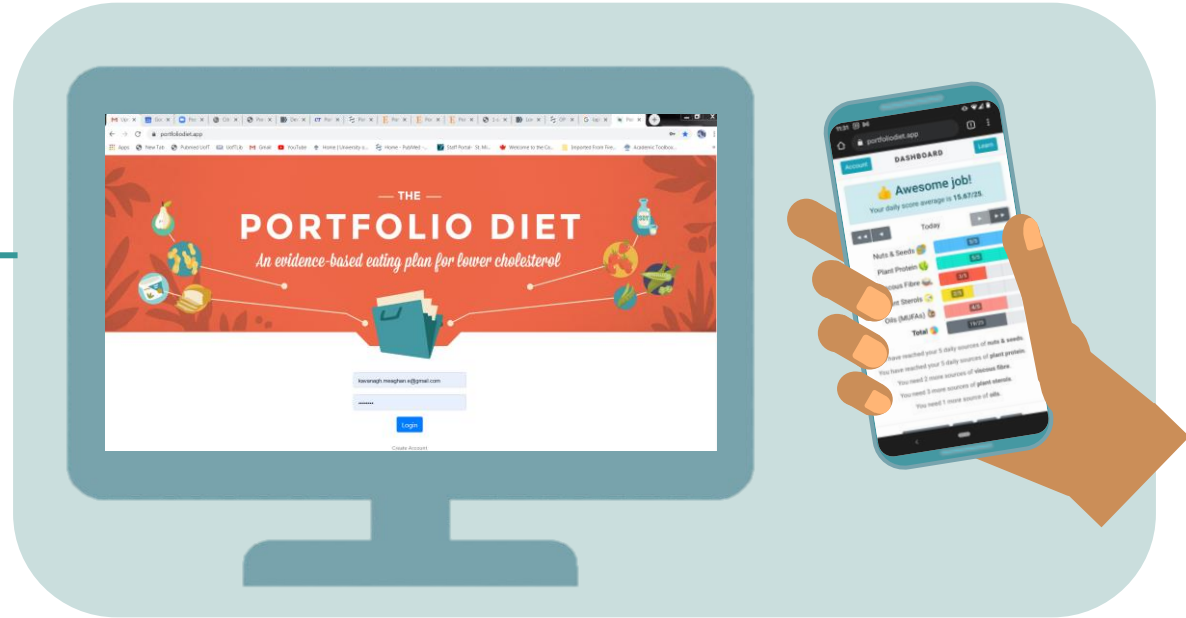
\*Health Canada and/or the Canadian Cardiovascular Society as well as the U.S. Food and Drug Administration (FDA) and/or European Food Safety Authority (EFSA).  
 † When replacing foods high in saturated fat like butter.

# The Portfolio Diet App

Research

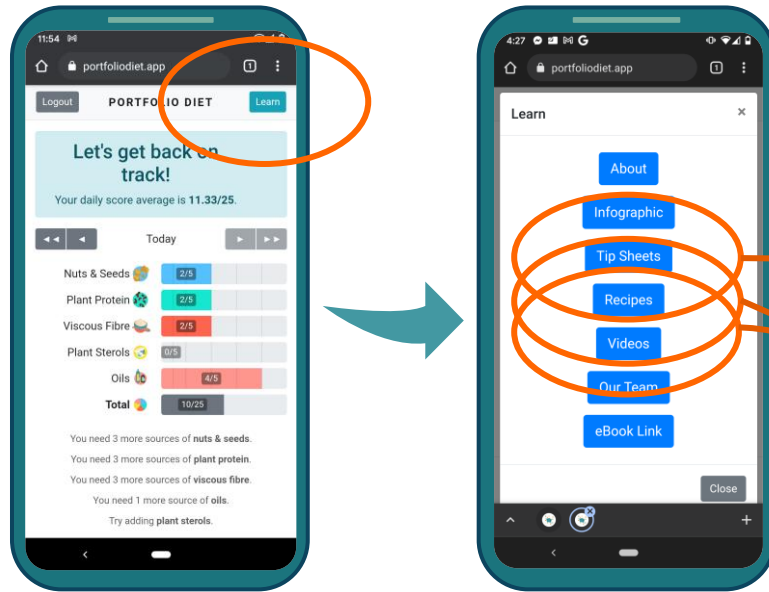


Clinical Practice guidelines



<https://portfoliodiet.app/>

# Videos, Tip Sheets, and Recipes



## All about Nuts and Seeds

Nuts and seeds are rich sources of **heart-healthy fats**, protein, vitamins & minerals. They can help **lower LDL-cholesterol**.

### Adding nuts to your diet can be quick and simple!

- Take them to go as a snack
- Top your salad or oatmeal with nuts
- Pair 2 tsp of any nut butter with fruits, vegetables or on oat bran bread as a snack

### Choosing types of nuts

- Choose a variety of nuts and seeds to benefit from the range of nutrients they provide
- Choose "all natural" or "just the nuts" versions of nut butters
- Choose plain, unsalted nuts
- Choose coated or **flavoured** nuts less often
- If choosing Brazil nuts, limit to 2 - 4 nuts/day among a mix of other nuts as they are very high in selenium

### Aim for 5 servings of nuts each day (45g/d = 1/3 cup)

- 9 almonds, peanuts & other small nuts (9 g)
- 5 walnut halves (9 g)
- 2 tsp nut butter
- 1 Tbsp seeds (flax, sunflower, chia, pumpkin, hemp)

### Tailoring to your tastes

- Flavour your own nuts with cumin, garlic or chili powder
- Try different nuts- buy small amounts at a bulk food store

For ideas on including nuts and seeds in your diet, check out our recipe ideas under the recipe tab.

See the **Peanut or Tree Nut Allergy Tip Sheet** for more information if you are allergic to nuts and/or tree nuts.

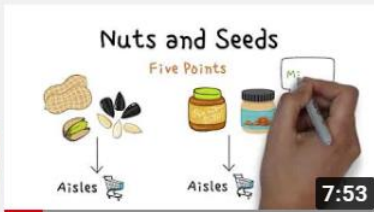
**Limit to 5 Portfolio servings** to make room for other Portfolio foods in your diet

Uploads ▶ PLAY ALL



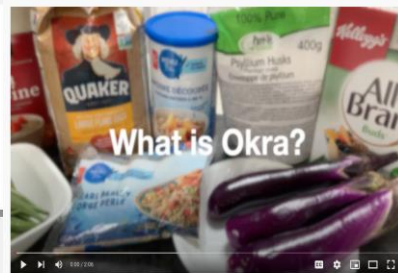
How to Choose Plant-based Meat Alternatives on the...

59 views • 3 months ago



The Portfolio Diet Grocery Store Tour

83 views • 3 months ago



All about Okra

76 views • 3 months ago



Peanut Tofu Satay

15 mins Beginner



Mushroom Barley Soup

1 hr Beginner





**Thank you to all  
the WHI  
participants!**