

**PLEASE CONSIDER FILLING OUT  
OUR SURVEY IF YOU ARE  
PLANNING ON ATTENDING 6+  
TALKS**

[HTTPS://UBC.CA1.QUALTRICS.COM/  
JFE/FORM/SV\\_BQS3QCDSRTNZPEU](https://UBC.CA1.QUALTRICS.COM/JFE/FORM/SV_BQS3QCDSRTNZPEU)



# MINI MED SCHOOL

## Talk 5: Popular Diets

DREW SMITH, BSC, UBC MD CLASS OF 2024



a place of mind  
THE UNIVERSITY OF BRITISH COLUMBIA

Faculty of Medicine



University  
of Victoria

let's talk  science

# TERRITORIAL ACKNOWLEDGEMENT



I would like to begin by acknowledging that I am joining you from the traditional, ancestral, and unceded territory of the ləkʷəŋən (Lekwungen) speaking peoples, including the Songhees, Esquimalt, and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.

# DISCLOSURE



I am a medical student. These talks do not constitute for or substitute medical advice.

This talk is meant to provide a background of a few popular diets and some of the evidence about them; I cannot discuss all the claims surrounding them. It is not meant to suggest what diet, if any, you should be on.

Please consult with your healthcare provider or a dietician if you have questions about nutrition and diets for yourself.

# OUTLINE

- Ketogenic/Very-low Carbohydrate Diet
- Mediterranean Diet
- Paleolithic Diet
- Vegetarian/Vegan Diet
- Intermittent Fasting



# KETOGENIC DIET

- Background
- How Does it Work?
- Safety During Pregnancy
- Weight Loss and Cardiovascular Risk Factors
- Type 2 Diabetes
- Type 1 Diabetes





Which medical condition was the keto diet originally used to help treat?

- A. Type 2 Diabetes
- B. Type 1 Diabetes
- C. Schizophrenia
- D. Epilepsy



Which medical condition was the keto diet originally used to help treat?

~~A. Type 2 Diabetes~~

~~B. Type 1 Diabetes~~

~~C. Schizophrenia~~

**D. Epilepsy**



# BACKGROUND



- Been around since early 1900's as treatment for pediatric epilepsy
- More recently for obesity and Type 2 Diabetes (T2D) management\*



\*Currently no evidence-based protocols for this

# BACKGROUND



- Different macronutrient ratios
  - Pediatric epilepsy → 80-90% calories from fat
  - Obesity and T2D → 65-80% calories from fat (20-25% protein, 5-10% carbohydrates)



# BACKGROUND

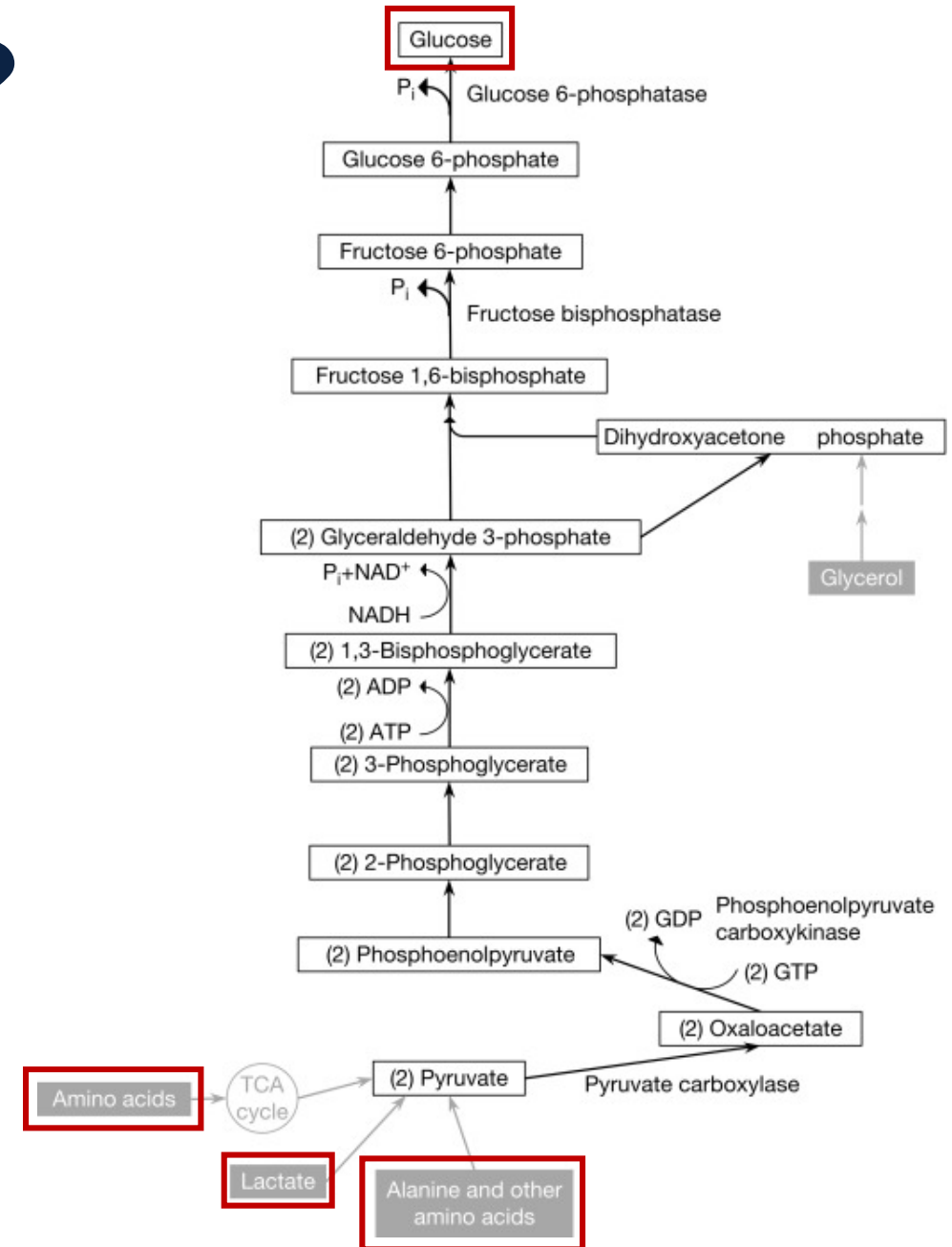
- Purpose is to transition body from mainly using glucose to mainly using fat (and amino acids) for energy
- Puts body into state called ketosis
- Achieved through consuming only 20-50g/day of carbs (or 5-10% caloric intake)
- Important to limit protein consumption to maintain ketosis





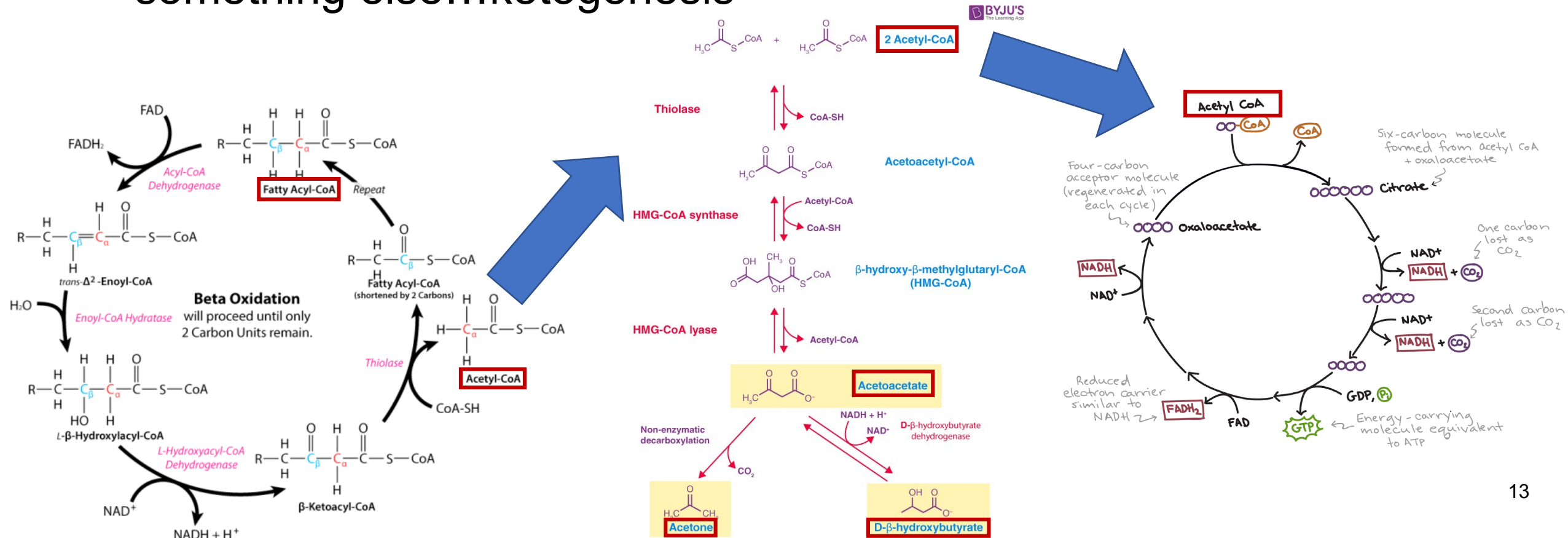
# HOW DOES IT WORK?

- After ~3 days of fasting or very low carb intake (<50g/day), body depletes carb stores and starts to rely on gluconeogenesis for energy



# HOW DOES IT WORK?

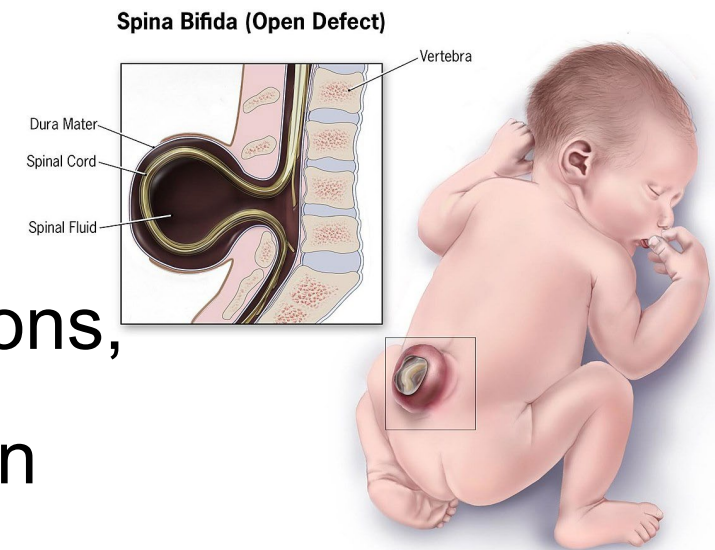
- Breaking down protein is not great, so we move onto something else...ketogenesis



# SAFETY DURING PREGNANCY



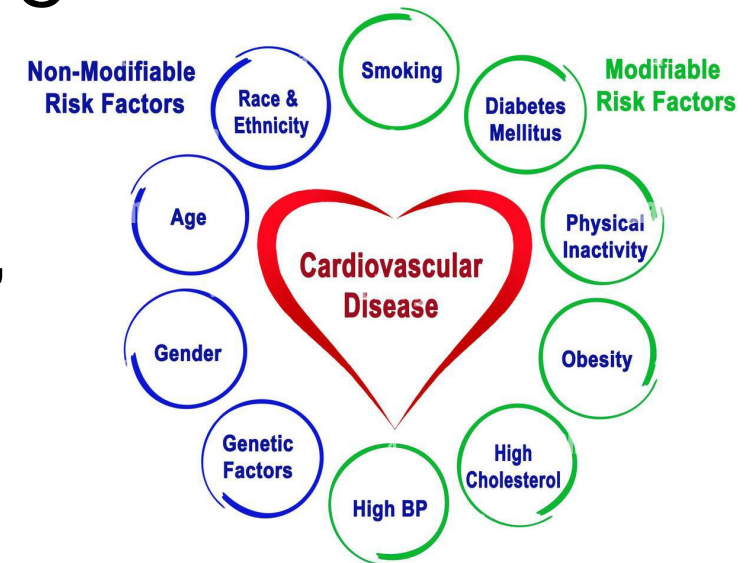
- Keto diet can be a non-pharmacologic alternative to anti-epileptic drugs, but need to weigh risks and benefits during pregnancy
- Anti-epileptics can cause congenital malformations, but safety of keto diet in pregnancy has not been established
- Potential cognitive or functional deficits in child (based on rodent studies), more research needed



# WEIGHT LOSS AND CARDIOVASCULAR RISK FACTORS



- Short-term (<6 months) may increase weight loss compared to low fat diet, but no difference by 6-12 months
- ↑ HDL-C and ↓ in triglycerides, but ↑ in LDL-C (can be extreme so need to monitor)
- No significant differences in blood pressure, insulin level or sensitivity, or glucose levels

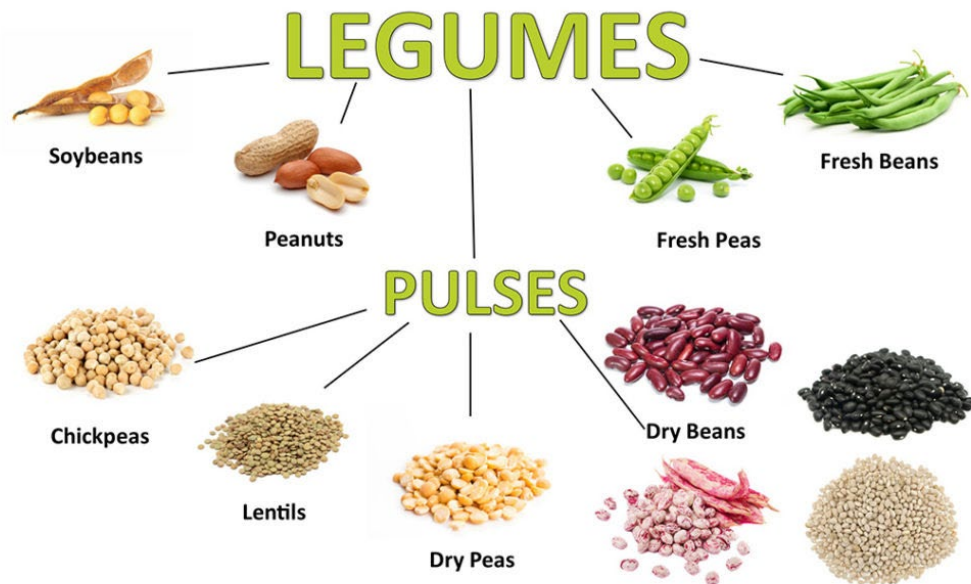




# WEIGHT LOSS AND CARDIOVASCULAR RISK FACTORS



- Foods that are known to be cardio-protective (e.g. beans, legumes, whole grains) would not be eaten because they would exceed carbohydrate requirements for diet



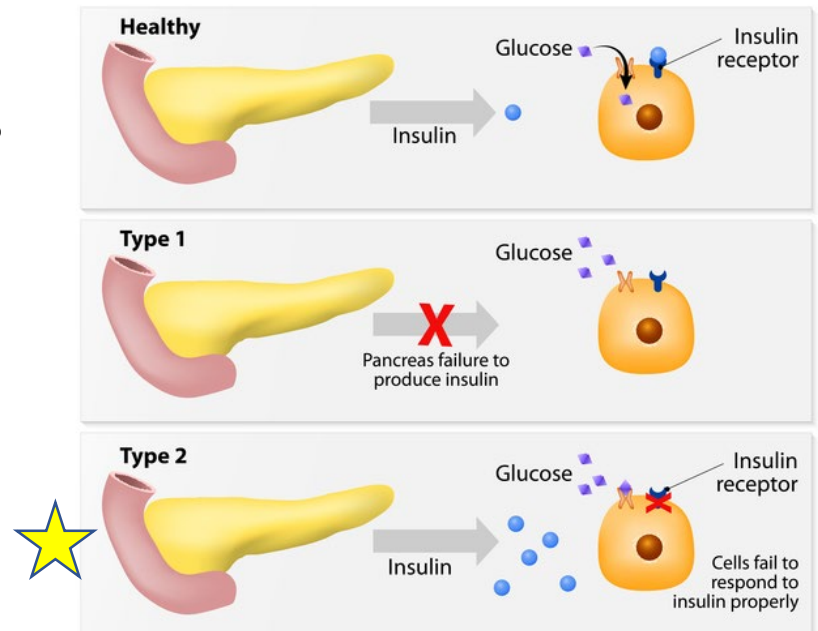


# TYPE 2 DIABETES (T2D)



- In patients with T2D, keto diet for 3-6 months may slightly decrease A1c, body mass index (BMI), and waist circumference compared to low fat diet
- Short-term (<6 months) may reduce diabetes meds and improve quality of life

## DIABETES MELLITUS



# TYPE 2 DIABETES (T2D)



- May be greater mild adverse effects (e.g. nausea, vomiting, constipation or diarrhea, and headaches), but no serious events (e.g. hypoglycemia)

## Keto Flu

### SYMPTOMS OF KETO FLU

BRAIN FOG »

« DIZZINESS

« IRRITABILITY

NAUSEA »

« CONSTIPATION

DIARRHEA »

« BODY ACHES

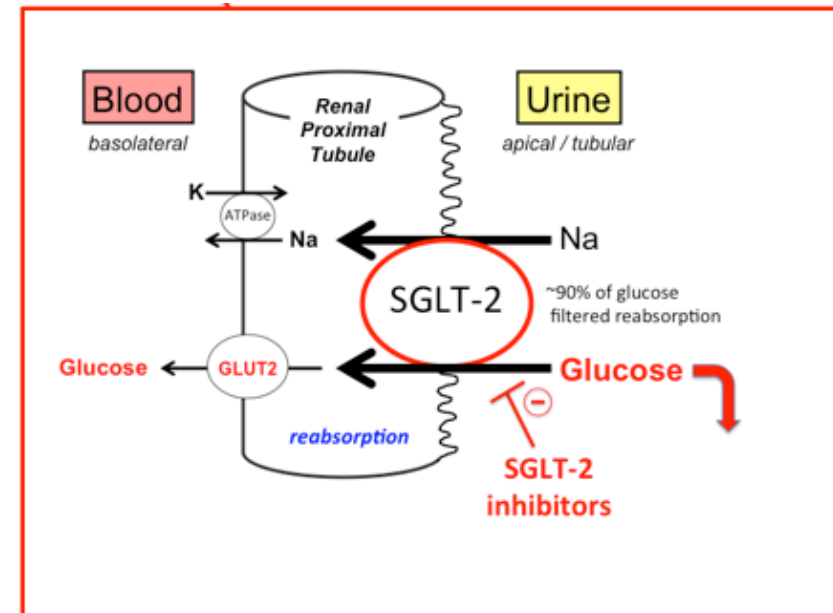
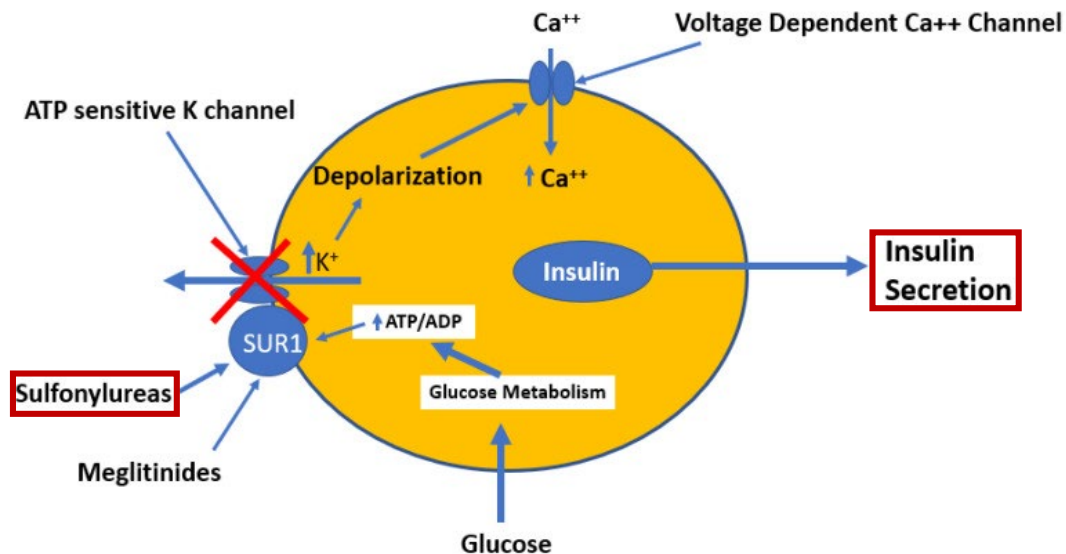
MUSCLE »  
CRAMPS



# TYPE 2 DIABETES (T2D)



- If on hypoglycemic meds (specifically sulfonylureas or insulin) need glucose monitoring for med adjustment as hypoglycemia possible
- Keto diet not recommended for people on SGLT-2 inhibitors because of risk of ketoacidosis

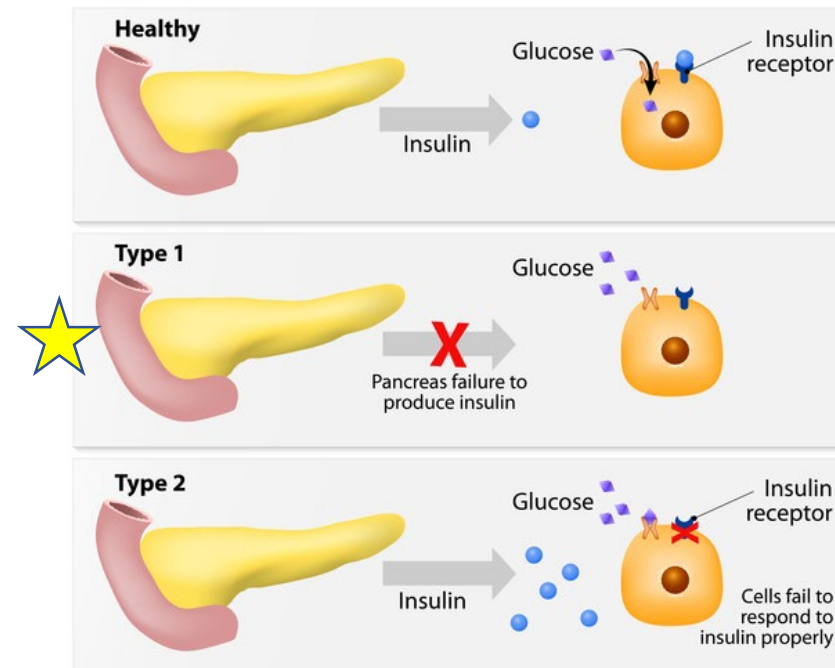


# TYPE 1 DIABETES (T1D)



- Diabetes Canada: option that may reduce A1c and provide low glucose variability, but this is based on insufficient and poor-quality evidence

## DIABETES MELLITUS



# OTHER CONSIDERATIONS



- Positives:
  - Short-term (<6 months) easy to reduce food intake because of appetite control
  - People consuming fewer calories from carbs tend to eat fewer foods high in added sugars and ultra-processed foods





# OTHER CONSIDERATIONS



- Negatives:
  - Long-term consumption of extreme carb intakes (low or high) associated with higher all-cause, cardiovascular, and cancer-related mortality
  - More carb restriction → higher risk for poor nutrient uptake (e.g. calcium, vitamin D, selenium, magnesium, zinc, and phosphorus)



# MEDITERRANEAN DIET

- Background
- Cardiovascular Disease (CVD) Primary Prevention
- Cardiovascular Disease (CVD) Secondary Prevention
- Weight Loss



# BACKGROUND



## Mediterranean Diet Pyramid

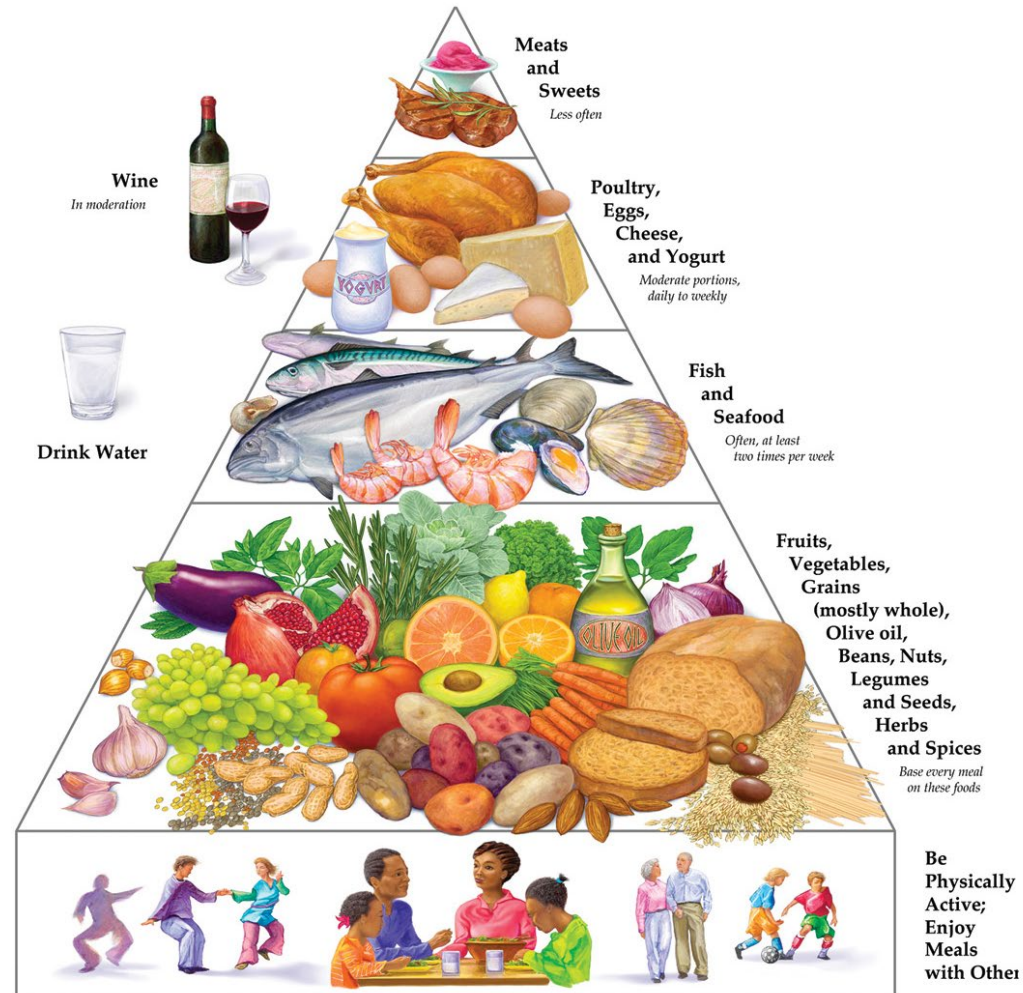


Illustration by George Middleton

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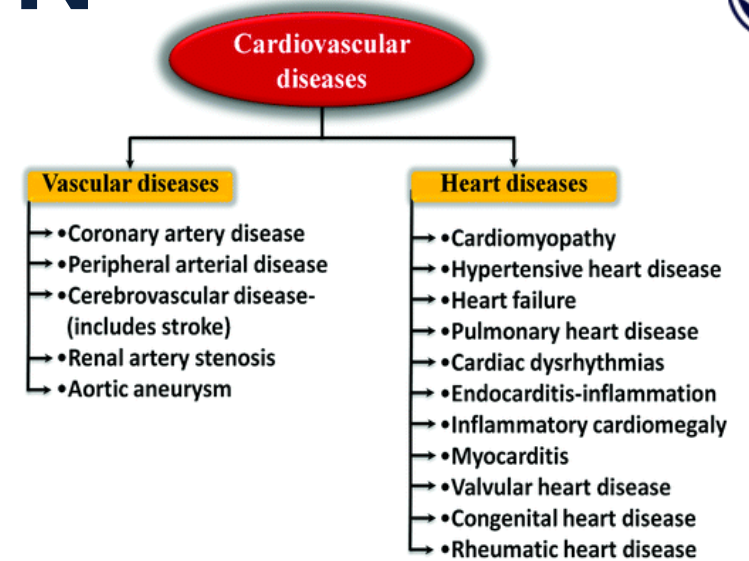
[www.oldwayspt.org](http://www.oldwayspt.org)



# CVD PRIMARY PREVENTION



- Prevention of CVD in healthy or at-risk individual
- PREDIMED:
  - Mediterranean diet vs control
  - Cardiovascular risk (measured by incidence of heart attack, stroke, and death) reduced by 30% in those who had the Mediterranean diet



1. Olive oil as the main culinary fat	Yes
2. Olive Oil	≥ 4 tbsp/day
3. Tree nuts and peanuts	≥ 3 servings/week
4. Fresh fruit	≥ 3 servings/day
5. Vegetables	≥ 2 servings/day
6. Fatty fish and seafood	≥ 3 servings/week
7. Legumes	≥ 3 servings/week
8. <i>Sofrito</i> tomato sauce (made with herbs and garlic)	≥ 2 servings/week
9. White meat instead of red & processed meats	Yes
10. Wine (optional, with meals)	≥ 7 glasses/week
11. Sugar-sweetened beverages	< 1 beverage/day
12. Baked goods (sweets, pastries, etc)	< 3 servings/week
13. Fat spreads (butter, margarine, etc)	< 1 serving/day
14. Red or processed meats	< 1 serving/day

# CVD PRIMARY PREVENTION



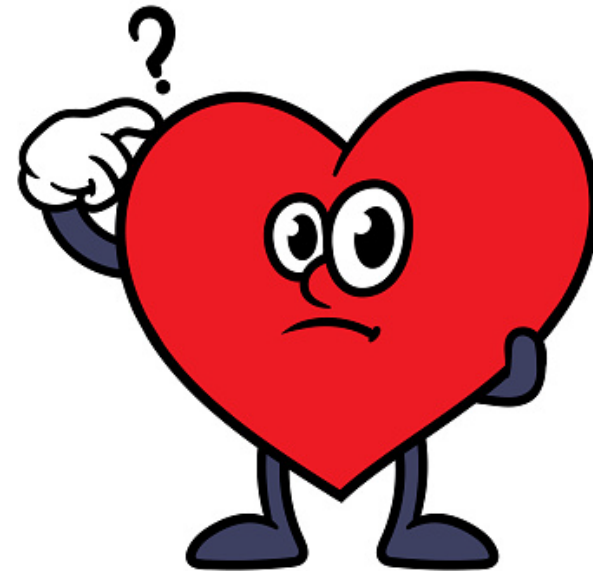
- 2016 Canadian Cardiovascular Society guidelines strongly recommend Mediterranean diet to lower CVD risk
- Other studies show slight reduction of LDL-C and triglycerides, but no clear effect on HDL-C and blood pressure



# CVD SECONDARY PREVENTION



- Prevention of further disease in someone who has history of CVD
- May reduce risk of CVD mortality, but little to no effects on blood pressure and lipid levels



# WEIGHT LOSS



- Meta-analyses show Mediterranean diet with calorie restrictions is as effective or more effective compared to low carb and low fat diets with or without calorie restrictions amongst overweight/obese adults

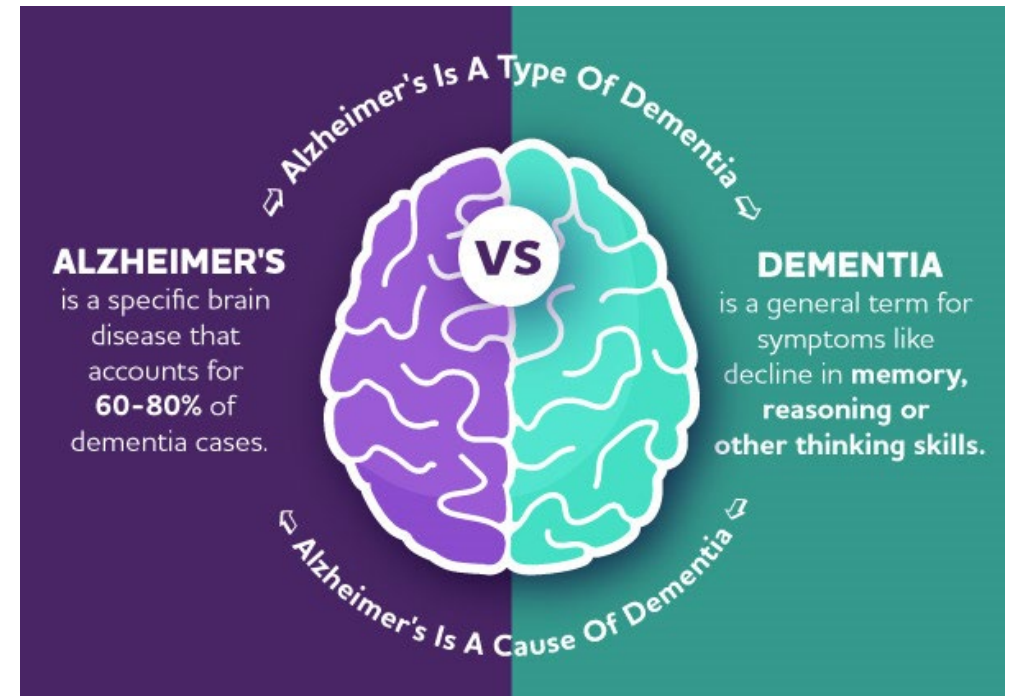
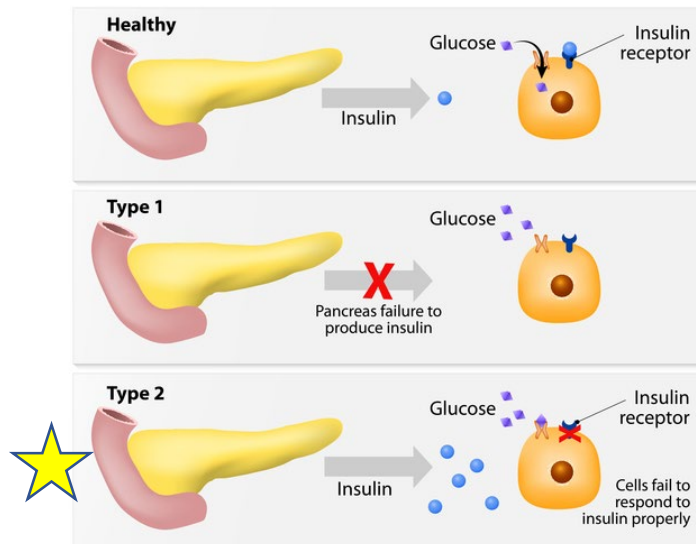


# OTHER POSITIVES



- May reduce risk of developing T2D and improve glucose control for people with T2D
- May delay development of cognitive disorders such as dementia and Alzheimer's disease

## DIABETES MELLITUS



**BREAK TIME FOR 10 MIN!**

**FILL OUT OUR RESEARCH SURVEY  
IF YOU HAVEN'T ALREADY!**

[HTTPS://UBC.CA1.QUALTRICS.COM/  
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# PALEOLITHIC DIET

- Background
- Weight Loss
- Waist Circumference and Fat Mass
- CVD Risk Factors
- Glucose Tolerance
- Satiety





Which type of food are you not supposed to eat while on a Paleo diet?

- A. Grains
- B. Red meat
- C. Fish
- D. Fruit





Which type of food are you not supposed to eat while on a Paleo diet?

**A. Grains**

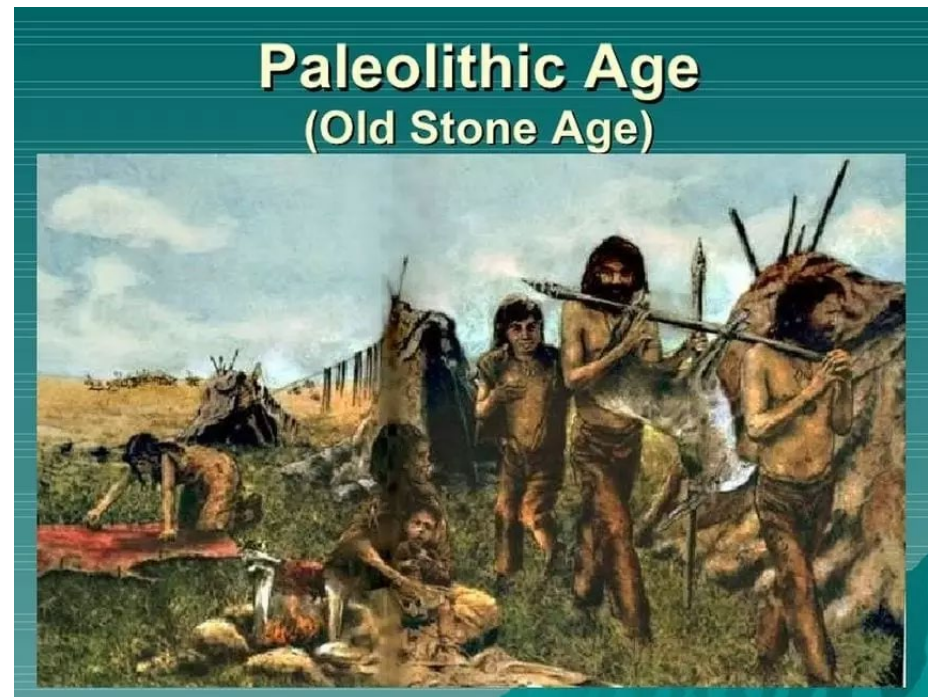
~~B. Red meat~~

~~C. Fish~~

~~D. Fruit~~

# BACKGROUND

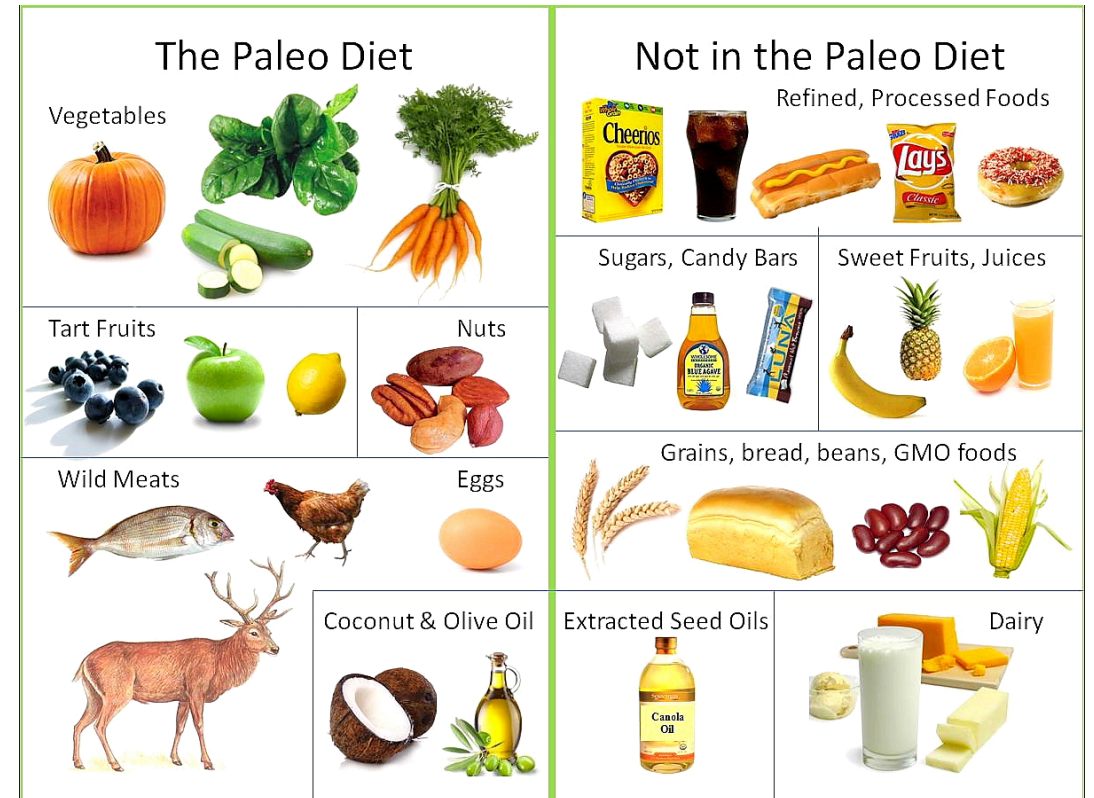
- Basic premise: our genetics haven't changed since development of agriculture 10,000 years ago and modern diets = chronic disease, so we should eat like our Paleolithic ancestors



# BACKGROUND

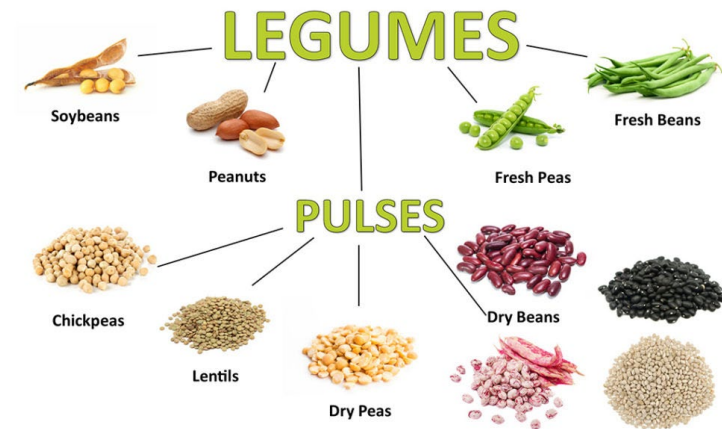


- Diet contains meat, fish, vegetables, fruit, and nuts, but no grains, dairy, sugar, salt, or processed foods
- Proportions vary where you look
- Also, legumes considered “toxic”



# BACKGROUND

- However...
  - Evidence that paleolithic ancestors did eat grains such as wild barley
  - Legumes are fine as long as they are cooked properly
  - Several populations have developed a tolerance for lactose





# BACKGROUND

- Other considerations:
  - Hunter gatherer lifestyle
  - Shorter life expectancy
  - Possible obesity based on artifacts

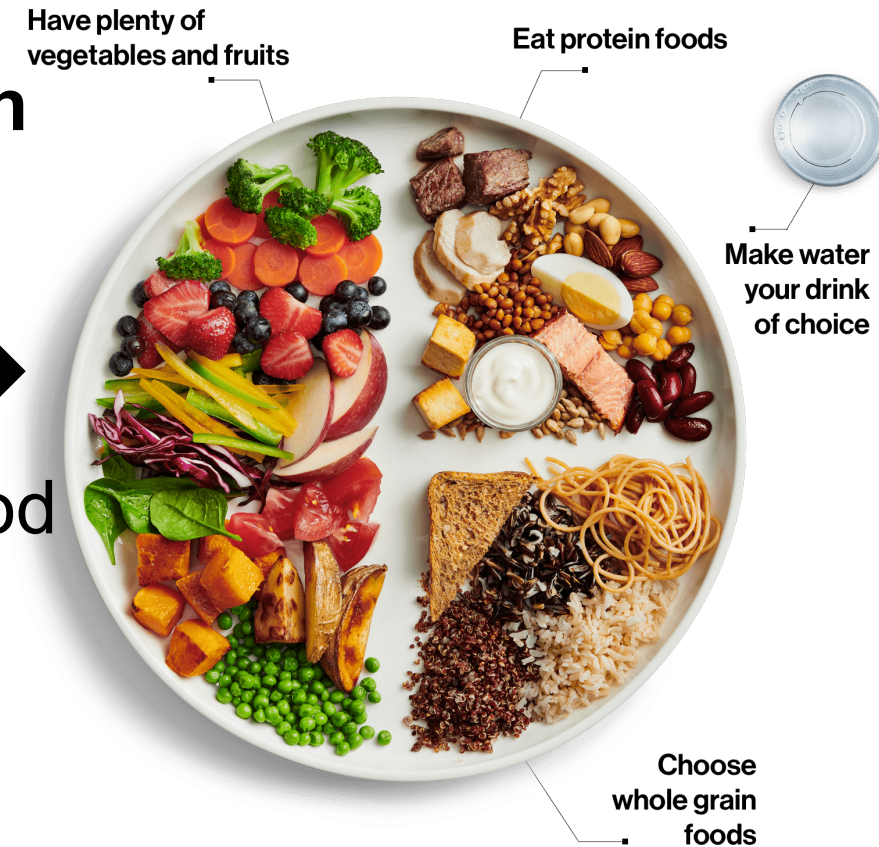
<https://www-pennutrition-com.eu1.proxy.openathens.net/docviewer.aspx?id=11294>



# SUMMARY OF STUDIES



- Following information based on three studies:
  - Paleo vs Mediterranean diet in **men with ischemic heart disease, obesity, and glucose intolerance**
  - Paleo vs diabetic diet (think Canada Food Guide) in **adults with T2D**
  - Paleo vs low fat/high fiber diet in **obese, post-menopausal women**



# WEIGHT LOSS

- Greater weight loss compared to diabetic diet at up to 3-6 months, no difference after
- Greater weight loss compared to low fat/high fiber diet at up to 18 months, no difference after
- No better than Mediterranean diet at any point



# WAIST CIRCUMFERENCE AND FAT MASS



- Lower waist circumference at 3 months compared to Mediterranean and diabetic diets, 6 months compared to low fat/high fiber diet, but no difference by 24 months
- No difference in fat mass or lean body mass compared to Mediterranean diet
- Greater loss of both fat mass and lean body mass compared to low fat/high fiber diet, but no difference by 24 months

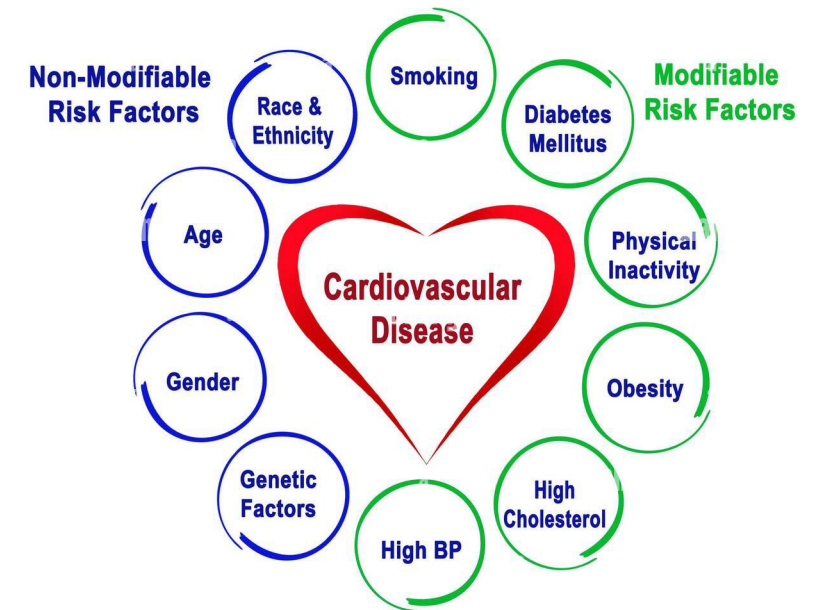




# CVD RISK FACTORS



- Decrease in triglycerides compared to diabetic and low fat/high fiber diets
- No difference in total cholesterol, LDL-C, C-reactive protein (CRP), or systolic blood pressure
- Conflicting evidence surrounding HDL-C and diastolic blood pressure



# GLUCOSE TOLERANCE



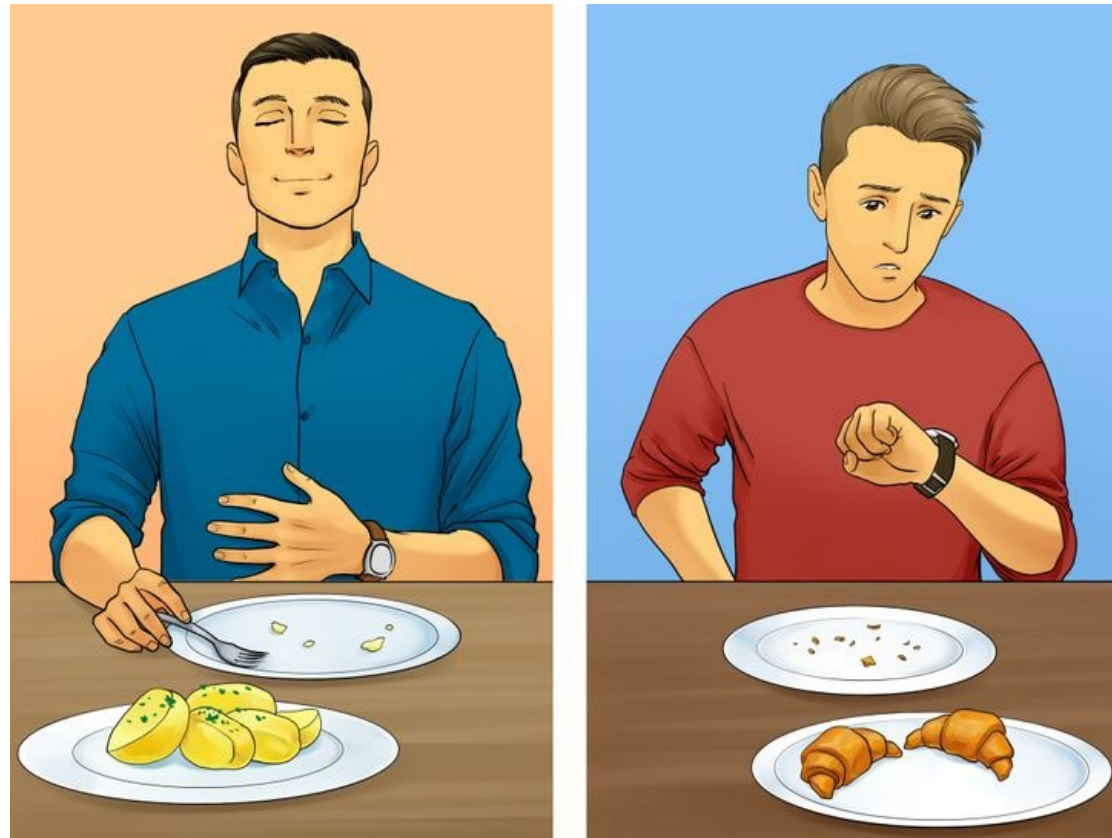
- Similar insulin levels, but conflicting results on glucose control when compared to Mediterranean and diabetic diets
- No difference in insulin levels or glucose control when compared to low fat/high fiber diet



# SATIETY



- Higher satiety compared to diabetic diet
- No difference compared to Mediterranean diet



# VEGETARIAN/VEGAN DIET

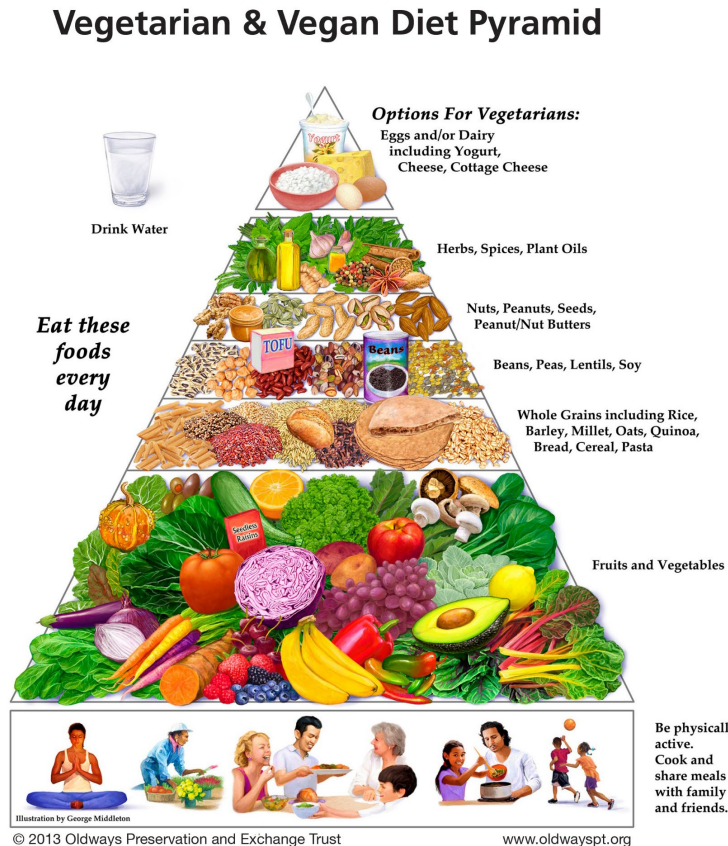
- Background
- Pregnancy Outcomes
- Life Cycle
- Cancer Risk
- T2D Risk
- Bone Health



# BACKGROUND



- Vegetarian diet → no meat, fish, or poultry
- Vegan diet → no food that comes from animals, including dairy and eggs





# PREGNANCY OUTCOMES



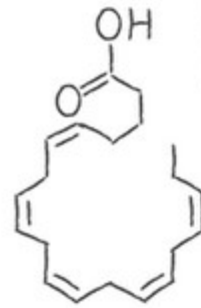
- As long as diet contains vegetables, fruit, whole grains, legumes, nuts, and seeds, and provides all required nutrients → then vegetarian/vegan diet is fine during pregnancy and breastfeeding
- Birth weight of newborn and duration of pregnancy not different compared to non-vegetarian



# NUTRIENTS OF CONCERN

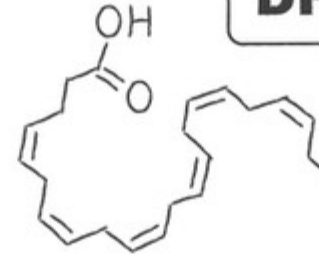


- Iron
- Zinc
- Vitamin B12
- Omega-3 fatty acids DHA and EPA



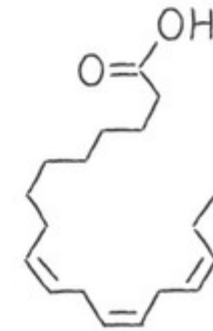
**EPA**

Eicosapentaenoic Acid (EPA) (20:5, n-3)



**DHA**

Docosahexaenoic Acid (DHA) (22:6, n-3)



**ALA**

Alpha-linolenic Acid (ALA) (18:3, n-3)





# LIFE CYCLE



- If same criteria met as in pregnancy/breastfeeding, then vegetarian/vegan diet appropriate for all stages of life
- Do not cause eating disorders in children or adolescents



# CANCER RISK

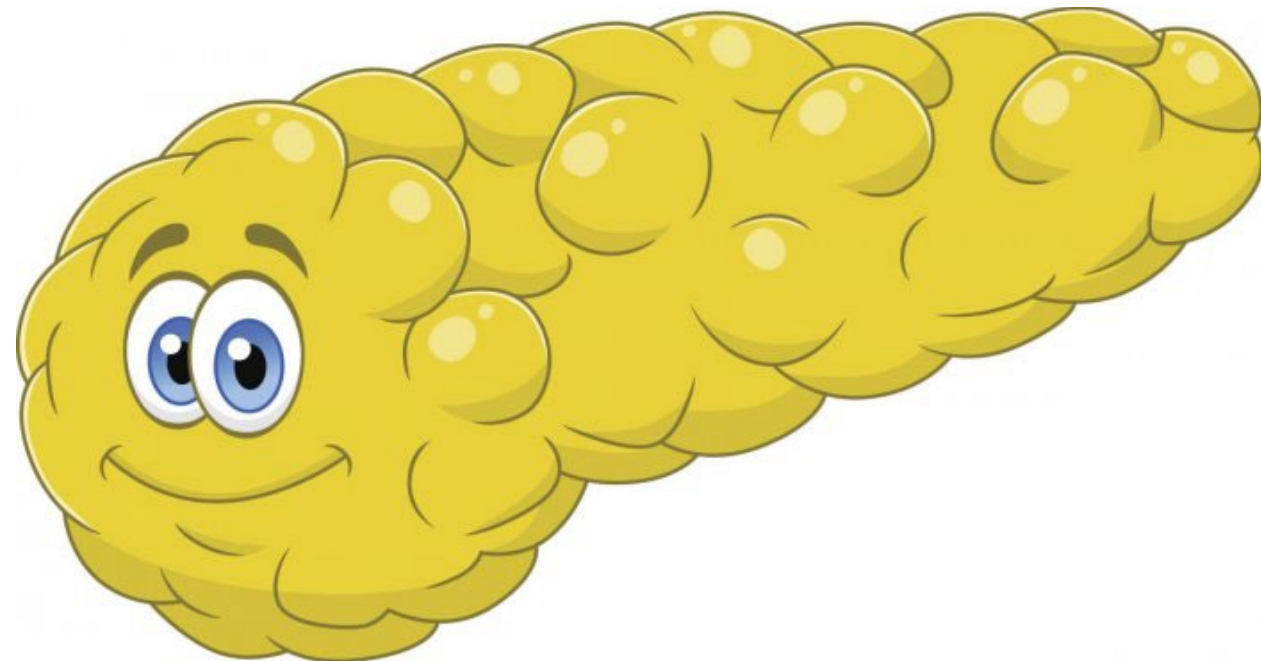


- Meta-analysis showed 8% reduced incidence of total cancer among vegetarians vs non-vegetarians and 15% reduction when comparing vegans to non-vegetarians
- Lower risk of colorectal cancer in pesco-vegetarian and semi-vegetarian vs non-vegetarian, suggesting small amount of fish or meat in a plant-based diet may help

# TYPE 2 DIABETES (T2D) RISK

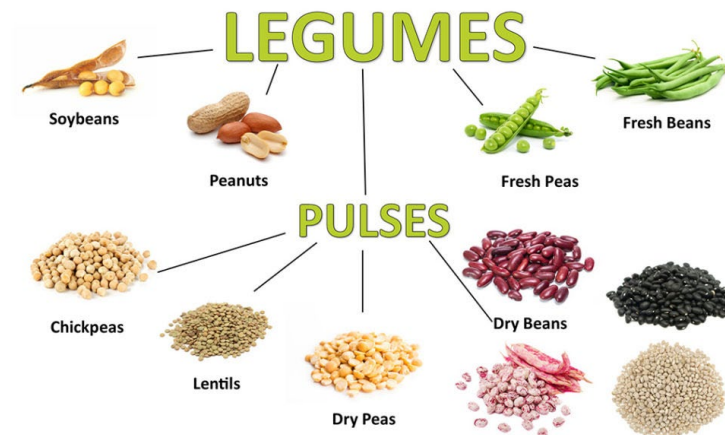


- Vegetarians at lower risk of developing T2D and have better glucose control
- Suggest vegetarian diet could be good for preventing and managing T2D



# BONE HEALTH

- Slightly lower bone mineral density (BMD) and higher fracture risk among vegetarians and vegans (more so vegans) compared to non-vegetarians over age of 50
- Need to ensure diet adequate in bone-supporting nutrients (e.g. calcium, vitamin D, protein, and vitamin B12)





True or False? A vegan diet should not be adhered to during pregnancy, breastfeeding, or childhood.

- A. True
- B. False



True or False? A vegan diet should not be adhered to during pregnancy, breastfeeding, or childhood.

~~A. True~~

**B. False**



# INTERMITTENT FASTING

- Background
- What does the evidence say?
- Some questions remaining



# BACKGROUND

- 16:8 method most popular
- 2-3 meals during 8-hour window
- Encouraged to have coffee, zero-calorie beverages, or water during fasting to help with hunger pangs
- Encouraged to eat healthy foods during feeding time (another plug for Canada Food Guide)

**THE 16/8 METHOD**

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
Midnight							
4 AM	FAST	FAST	FAST	FAST	FAST	FAST	FAST
8 AM							
12 PM	First meal	First meal	First meal	First meal	First meal	First meal	First meal
4 PM	Last meal by 8pm	Last meal by 8pm	Last meal by 8pm	Last meal by 8pm	Last meal by 8pm	Last meal by 8pm	Last meal by 8pm
8 PM							
Midnight	FAST	FAST	FAST	FAST	FAST	FAST	FAST



# WHAT DOES THE EVIDENCE SAY?



- Not much right now...
- Lack of data to assess cardiovascular outcomes
- Short-term (<3 months) improvement in body weight compared to no treatment/diet, but medium-term (3-12 months) no effect compared to continuous calorie management
- Uncertain effect on glucose control



# SOME QUESTIONS REMAINING



- Does it affect well-being? (e.g. not eating with family members)
- Does it trigger disordered eating?
- Are any of the benefits seen having to do with intermittent fasting or something else? (e.g. late night junk food cut out because not eating at that time anymore)



# HELPFUL RESOURCES

- Your healthcare provider or a dietitian (dial 811)
- Canada Food Guide <https://food-guide.canada.ca/en/>
- Health Link BC <https://www.healthlinkbc.ca/>
- UnlockFood.ca <https://www.unlockfood.ca/en/default.aspx>
- Practice-based Evidence in Nutrition (PEN)  
<https://www.pennutrition.com/index.aspx>
- Diabetes Canada <https://www.diabetes.ca/nutrition---fitness>
- StatPearls on NCBI <https://www.ncbi.nlm.nih.gov/books/NBK430685/>
- Mayo Clinic, Cleveland Clinic, etc. (.gov, .org)



# FUTURE TALKS

- Sunday Jan 30: The biology of stress
- Sunday Feb 6: Stress management
- Sunday Feb 13: How to avoid a drug interaction
- Sunday Feb 20: Supplements



We hope to see you there!





THE UNIVERSITY OF BRITISH COLUMBIA

Thank you!

Any questions?