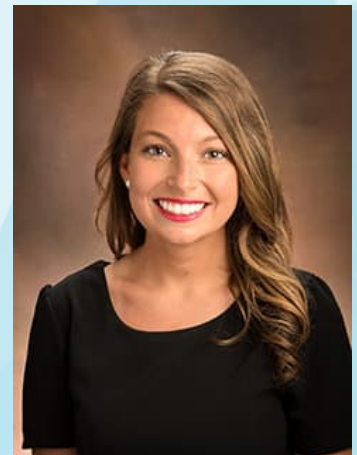
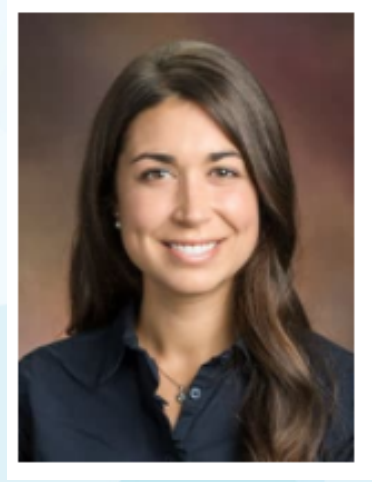


# FUELING A HEALTHY GUT FOR PEDIATRIC IBD

**Jessica Breton, MD**

**Natalie L. Stoner, RD, CSP, LDN**

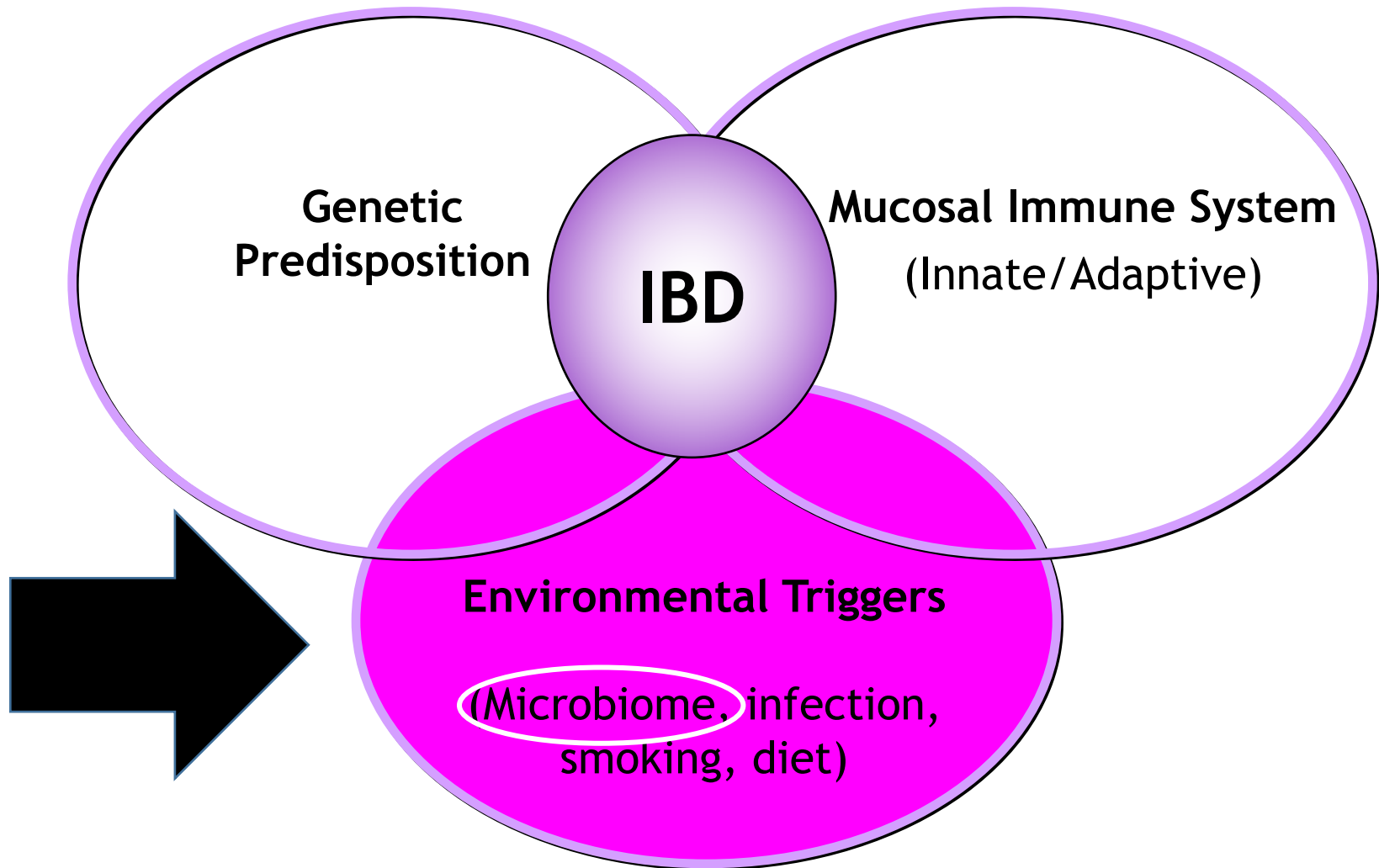
**February 21, 2021**



# Why is Nutrition Important?

- Poor nutrition can affect:
  - Disease outcomes
  - Adult height
  - Bone health
- Good nutrition can:
  - Decrease symptoms
  - Improve vitamin/mineral balance
  - Improve growth

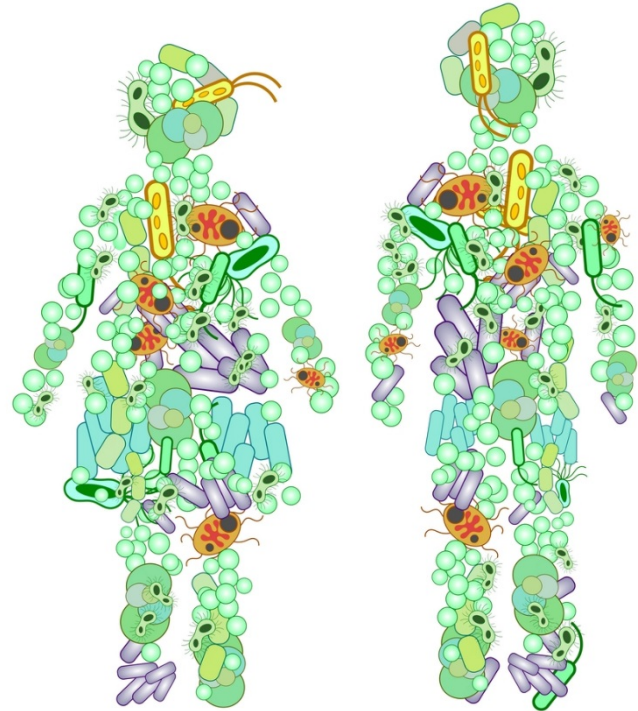
# Inflammatory Bowel Disease



# The Gut Microbiota

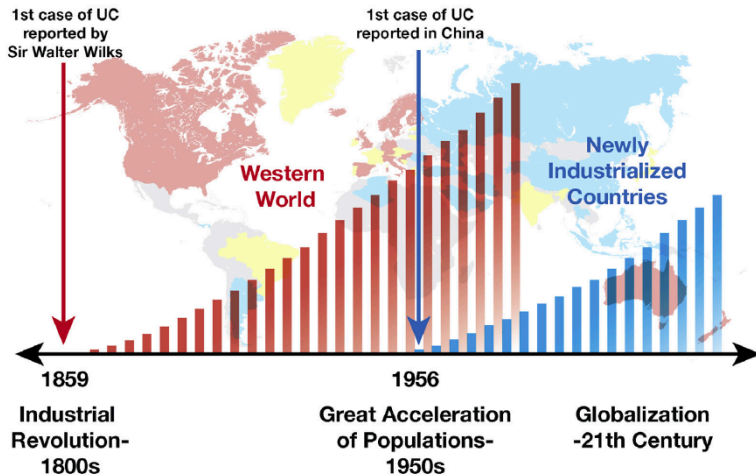
*We are more bacteria than we are human*

- There are 100 trillion bacteria that live in our gut
- 10x the number of “human” cells in our body
- 100x as many genes as there are in the human genome



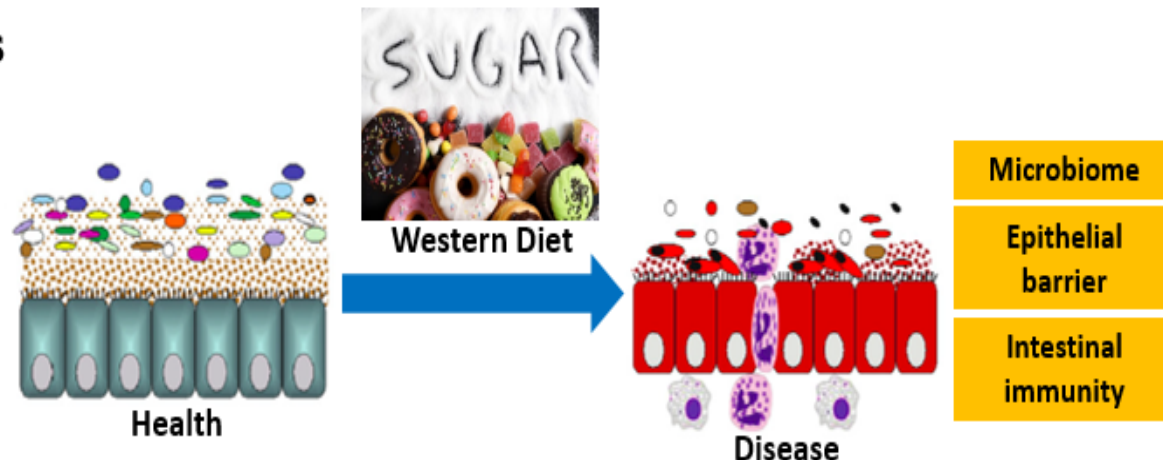
- Microbial colonization starts at birth
- This partnership has evolved over thousands of years

# Is there a relationship between diet, the gut microbiota and IBD?



Rising incidence of IBD globally parallel change in diet and lifestyle

## Hypothesis



Current evidence coming mostly from animal models and human cell lines



**What do children/adolescents with IBD typically eat?**

# Poor quality, pro-inflammatory diet in children with Crohn's disease and healthy children

## Study:

- 144 children with Crohn's disease and 57 healthy children
- 3 days diet recall
- Diet quality scored according to:
  - 1) Healthy Eating Index and 2) Dietary Inflammatory Index

## Results:

- Both children with CD and healthy children eat a Western Diet, **high in saturated fats, refined sugar, salt** and **low in fruits/veggies and in fiber** \*

*\* Even lower in children with IBD!*

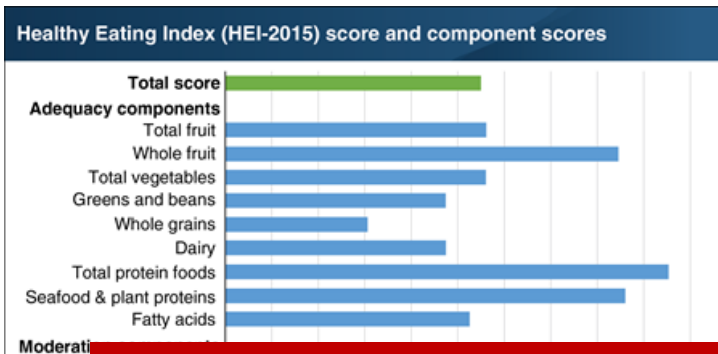


# Dietary Indices

## HEI - 2015

- Assess adherence to the Dietary Guidelines for Americans (DGA)
- 13 calorie-adjusted ‘**Adequacy**’ & ‘**Moderation**’ components

Score 0-100, ↑ Score = Healthier



## DII

- Literature-derived index
- 45 food parameters based on their relationship with serum inflammatory markers in published studies through 2010

↑ Score = ↑ Inflammatory



Anti-

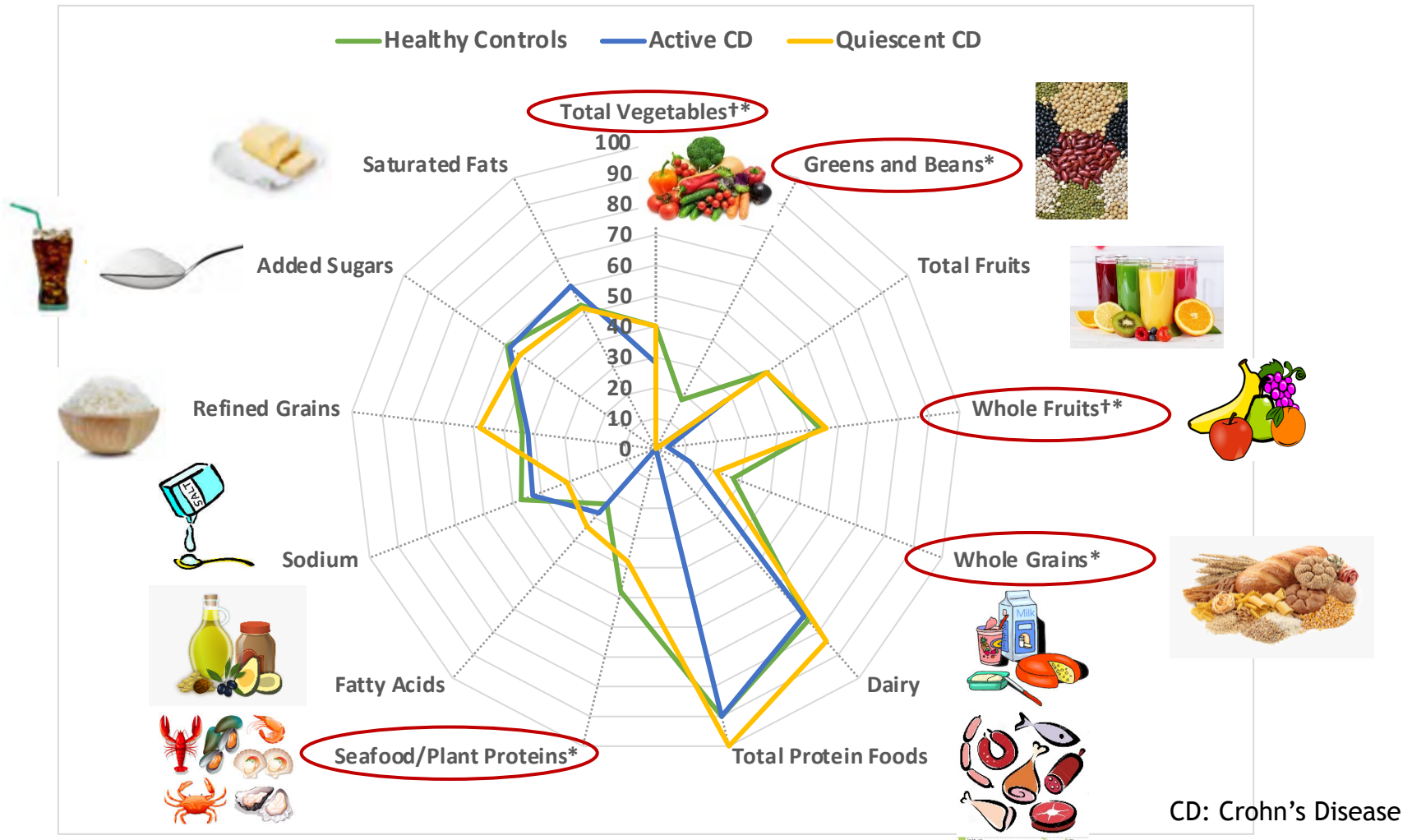


Pro-

Both children with CD and healthy children score low on the HEI and high on the DII



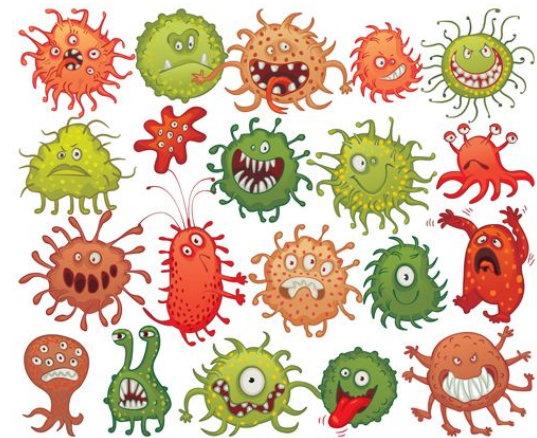
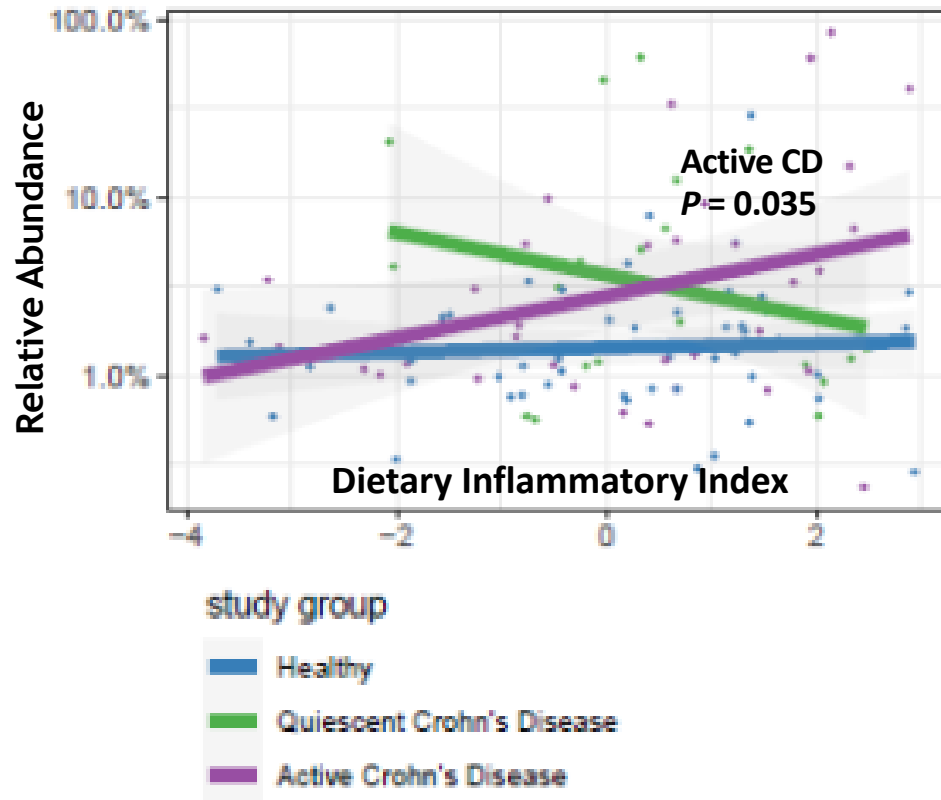
# Healthy Eating Index-2015: Radar Plot



	Quiescent CD	Active CD	Healthy Controls	P-value
HEI-2015, median [IQR]	51.6% (42.0-60.1)	42.4% (35.4-51.2)	47.0% (41.4-58.5)	0.003

A **pro-inflammatory diet** (high DII) is associated with a **↓ in microbiome richness**, **↑ bad (pro-inflammatory) Proteobacteria**

### Proteobacteria



# What should we eat?



**# 1 question  
we get**

Added Sugar  
Artificial Ingredients  
Saturated Fats  
Red Meat

Variety  
Dense Foods



# There is no “IBD Diet”...yet!

- No specific diet for IBD
- General recommendation for patients with IBD
  - Mediterranean-Style Diet
- Dietary approaches for treating IBD:
  - Exclusive Enteral Nutrition (EEN)- Crohn’s disease
  - Exclusion diets:
    - Specific carbohydrate diet (SCD)
    - Crohn’s disease exclusion diet (CDED)
  - Other diet therapies under research protocol

# Mediterranean-Style/ “Anti-Inflammatory” Diet

## Promote intake of :

- Fresh fruits + vegetables
- Whole grains
- Legumes/Beans
- Nuts and seeds
- Olive oil as a primary fat source
- Dairy products, eggs, fish and poultry



## Limited intake of:

- Added/refined sugar
- Artificial sweeteners & sugar alcohols
- Salt
- Highly processed & long shelf-life foods
- Saturated fats
- Red meats, processed meats



**Avoid the  
middle aisles!**

---



# Food Label Reading Tips

Words to Look for	Words to Avoid
Organic, pasture raised	Carrageenan
Raw	Hydrogenated Oils
Antibiotic-free	Monosodium Glutamate (MSG)
Hormone-free	Added sugar
Unsweetened	Artificial sweeteners (sucralose, aspartame, saccharin)
Whole grains, fibers	
Wild-caught	Sugar alcohols (sorbitol, xylitol, erythritol, maltitol)



# Nutrition Facts

Serving Size 2 bars (42g)  
Servings Per Container 6

Amount Per Serving	2 bars	1 bar
<b>Calories</b>	190	90
Calories from Fat	60	30

	%DV*		%DV*	
<b>Total Fat</b>	6g	9%	3g	5%
Saturated Fat	0.5g	3%	0g	0%
Trans Fat	0g		0g	

<b>Cholesterol</b>	0mg	0%	0mg	0%
<b>Sodium</b>	160mg	7%	80mg	3%

<b>Total Carbohydrate</b>	29g	10%	15g	5%
Dietary Fiber	2g	8%	1g	4%
Sugars	12g		6g	

<b>Protein</b>	4g		2g	
<b>Iron</b>		4%		2%

Not a significant source of vitamin A, vitamin C and calcium.

\*Percent Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

		Calories 2,000	2,500
Total Fat	Less Than	65g	80g
Sat Fat	Less Than	20g	25g
Cholesterol	Less Than	300mg	300mg
Sodium	Less Than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Ingredients: Whole Grain Oats, Sugar, Canola Oil, Yellow Corn Flour, Honey, Soy Flour, Brown Sugar Syrup, Salt, Soy Lecithin, Baking Soda, Natural Flavor.  
**CONTAINS SOY; MAY CONTAIN PEANUT, ALMOND AND PECAN INGREDIENTS.**

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GENERAL MILLS SALES, INC.  
MINNEAPOLIS, MN 55440 USA  
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Carbohydrate Choices: 2

3202646161

\*16g of whole grain per serving.  
At least 48g recommended daily.



## DAILY GOALS

### Fiber:

Age + 5g or 25-30g (adults)

### Added Sugar:

≤10% of Energy



### Saturated Fat:

≤10% of Energy



# Can you spot the difference between these two plant based milk alternatives?

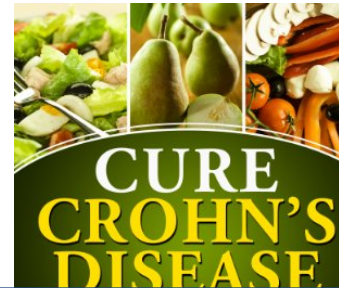
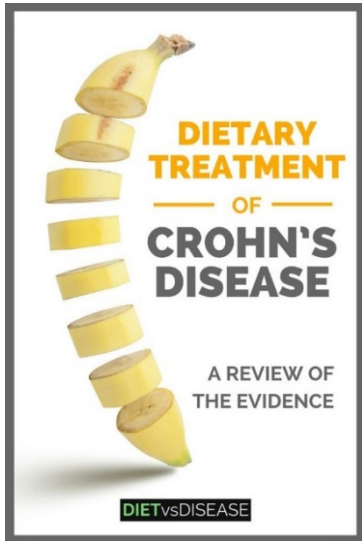


Nutrition Facts	
Serving Size 1 Cup (240mL) Servings Per Container 8	
Amount Per Serving	
<b>Calories</b> 30	Calories from Fat 25
% Daily Value*	
<b>Total Fat</b> 2.5g	4%
Saturated Fat 0g	0%
Trans Fat 0g	
Polyunsaturated Fat 0.5g	
Monounsaturated Fat 1.5g	
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 160mg	7%
<b>Potassium</b> 35mg	1%
<b>Total Carbohydrate</b> <1g	0%
Dietary Fiber <1g	2%
Sugars 0g	
<b>Protein</b> 1g	
Vitamin A 10% • Vitamin C 0%	
Calcium 45%	Iron 2%
Vitamin D 25%	Vitamin E 20%
Riboflavin 4%	Magnesium 4%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Potassium	3,500mg 3,500mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g

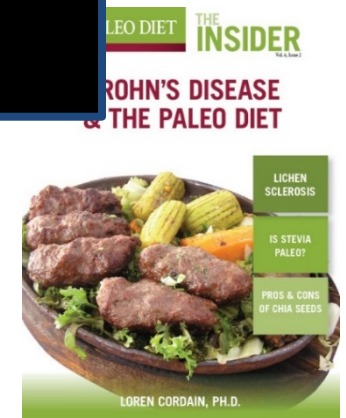
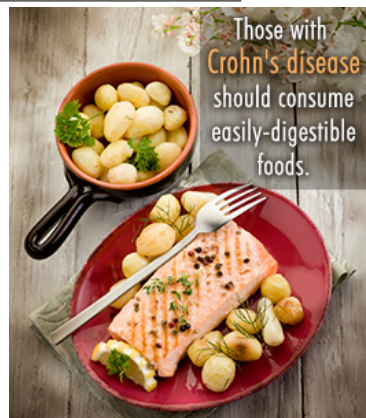


Nutrition Facts	
3.5 servings per container	
<b>Serving size</b>	<b>8 oz. (226g)</b>
Amount Per Serving	
<b>Calories</b>	<b>100</b>
% Daily Value*	
<b>Total Fat</b> 9g	12%
Saturated Fat 0.84g	4%
Trans Fat 0g	
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 75mg	3%
<b>Total Carbohydrate</b> 2g	1%
Dietary Fiber 1g	4%
Total Sugars < 1g	
Includes 0g Added Sugars	0%
<b>Protein</b> 4g	8%
Vitamin D 0mcg	0%
Calcium 38.5mg	2%
Iron 0mg	0%
Potassium 123mg	2%
*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.	

# Diet Therapy and IBD: What's out there?



**# 2 question we get**



# Dietary Therapies

- Use of nutrition as primary or adjunctive therapy with the goal of improving symptoms and heal the mucosa/gut lining (remission)
- Not every patient may be a candidate for diet therapy
  - Talk with your GI doctor/medical team
- Progress is evaluated using the same outcomes/standards as medication
  - Growth & weight gain
  - Symptoms
  - Laboratory work
  - Endoscopy, imaging

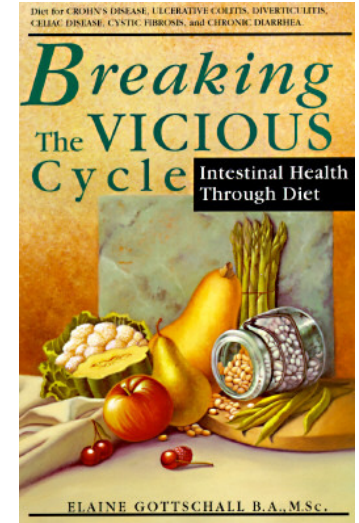
# EEN for Induction of Remission in CD

- How exclusive?
  - 80-100% of calories from formula
  - May require naso-gastric tube
- Efficacy not associated with a specific formula
- Duration: 6-8 weeks most common (range 4-12 weeks)
  - Improvement in symptoms by week 4
- Effective therapy for pediatric Crohn's
  - Induction of remission->75% (= steroids)
  - Achieves mucosal (gut lining) healing (steroids don't!)
  - Improves nutrition & bone status and lean mass
- Limited long-term benefit -Exit strategy?



# The Specific Carbohydrate Diet (SCD)

- Encourages wholesome foods that are easily digested
- Restricted “illegal” foods on the SCD:
  - All grains besides nut based flours
  - Refined sugars (honey is allowed)
  - Cow’s milk products (fully fermented yogurt ok)
  - “Processed foods”
- Evidence for efficacy in IBD is limited
  - Small, non-randomized studies - larger clinical trials needed
- Concerns: Elimination of whole food groups from the diet, inadequate calories, emotional well-being
  - Calcium/Vitamin D supplement required
- Close monitoring by medical team and dietitian



# Crohn's Disease Exclusion Diet (CDED)

- Pediatric Randomized Controlled Trial published in 2019

Dietary Therapy: Crohn's Disease Exclusion Diet + Partial Enteral Nutrition vs. Exclusive Enteral Nutrition

EEN

CDED+PEN

**CDED**  
Remove  
Animal Fat

## Great...but:

- All participants had mild disease with short disease duration (<36 mos)
- No endoscopic/mucosal healing endpoint, but significant ↓ in stool calprotectin
- Long term outcomes unknown

Will patients achieve mucosal healing with diet alone by 6 months?

Is the diet sustainable long term?

### Secondary endpoints:

**Both CDED+PEN and EEN are effective to achieve remission at week 6**

**CDED+PEN is superior to sustain remission and reduce inflammation at week 12**

**CDED+PEN: associated with reduction in Proteobacteria and Intestinal Permeability**

# Crohn's Disease Exclusion Diet

## Phase 1

- 50% calorie needs met through formula
- Mandatory, Allowed, Disallowed Foods
- Weeks 0-6

## Phase 2

- 25% calorie needs met through formula
- Mandatory, More Allowed, Disallowed Foods
- Weeks 7-12

## Phase 3

- Maintenance Phase
- Allows for “Cheat Meals” & 2 days off formula
- Ongoing

# Diet and IBD

- Integral part of IBD management
- No specific IBD diet
  - Mediterranean-Style Diet
- Dietary therapy
  - EEN is effective therapy for Crohn's
  - Restriction diets involving regular food have shown promise
  - Following objective outcomes closely are critical
  - Further studies on dietary therapy needed





**THANK YOU!**

# TO MAKE AN APPOINTMENT WITH AN IBD DIETITIAN, CALL 215-590-PIBD (7423)

- IBD Dietitian: Natalie Stoner, RD, LPN
  - Main campus
- Registered Dietitians available in:
  - Abington
  - Chalfont
  - Exton
  - King of Prussia
  - Lancaster
  - Princeton
  - Voorhees