

# Is there an anti-inflammatory diet for IBD?

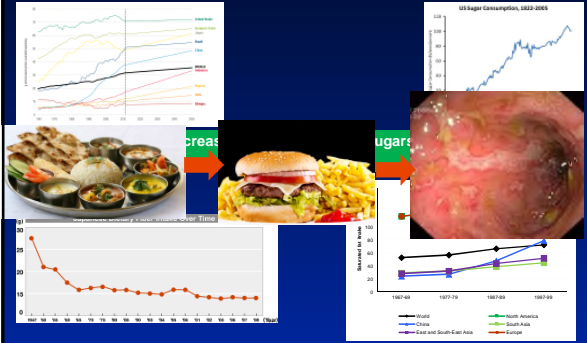
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Baylor IBD Conference  
 Dallas, April 2017



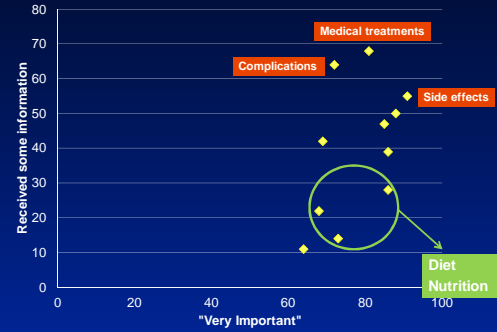
## Why diet? Global trends in diet parallel IBD



## Diet and IBD Objectives

- Identify why diet may be important in disease pathogenesis
- Recognize dietary triggers of disease onset and relapse in IBD
- Understand the role of dietary interventions in the management of Crohn's disease and ulcerative colitis

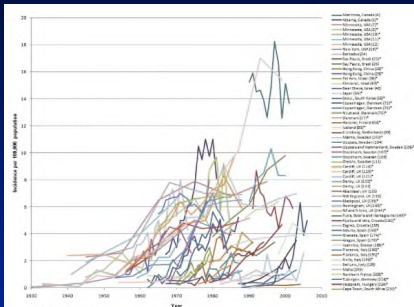
## Why diet? Patients want to know



Bernstein KI. Inflamm Bowel Dis. 2011 Feb;17(2):590-8.

## Why diet?

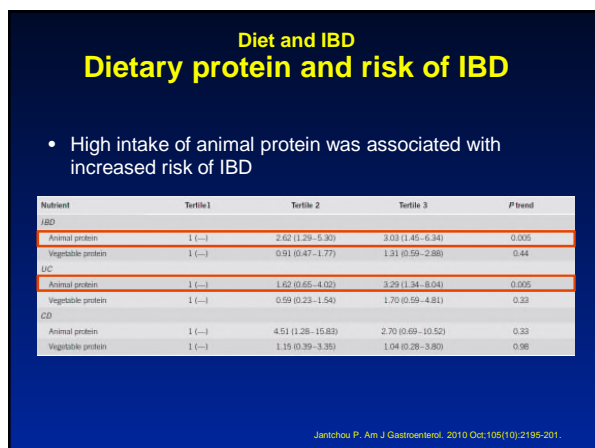
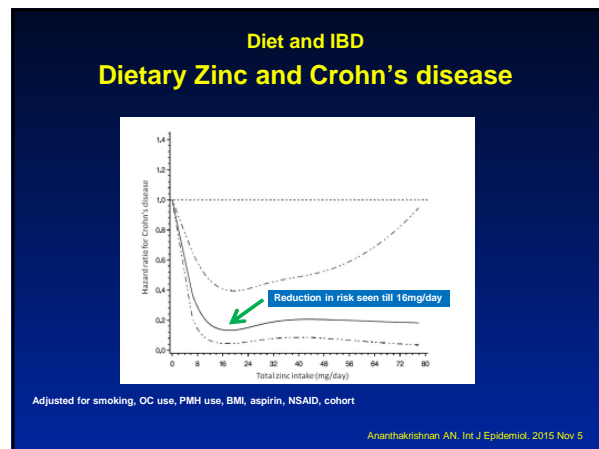
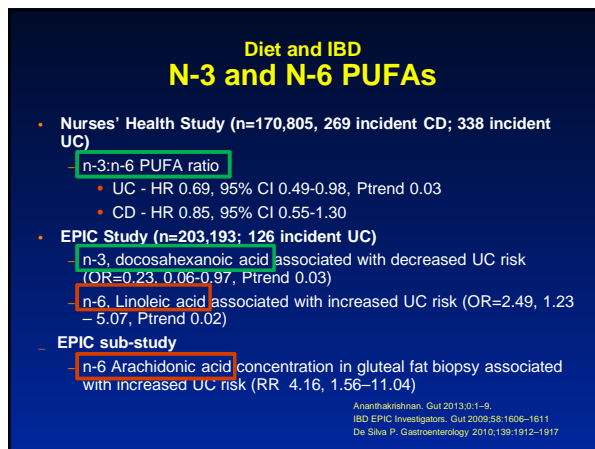
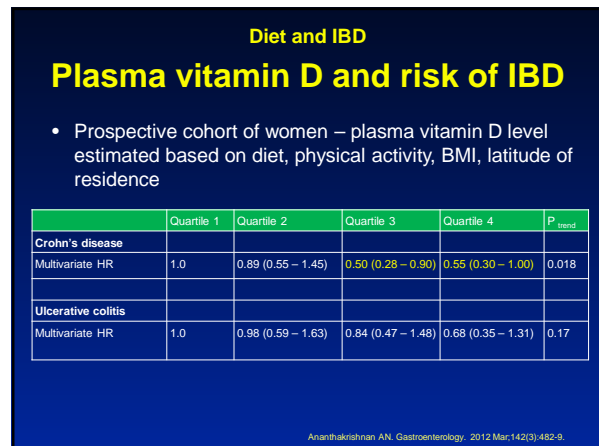
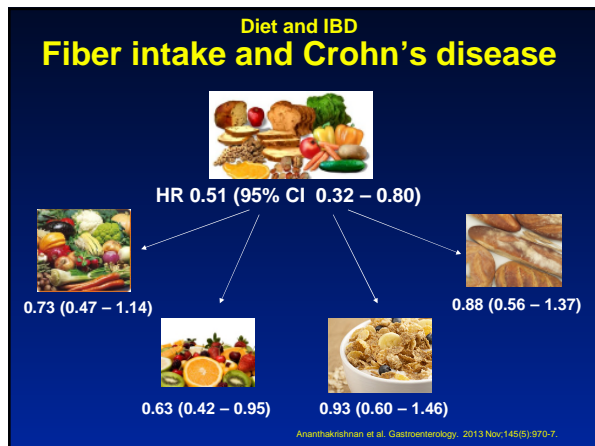
### Increasing incidence of IBD globally



## Diet and IBD

### Challenges in establishing causality

- "Diet" is complex and consists of parallel and contrasting food groups and nutrients
- Diet is modified by symptoms prior to diagnosis
- Diet varies over time in childhood and adult life
- In addition to food, "diet" may include additives and methods of food preparation



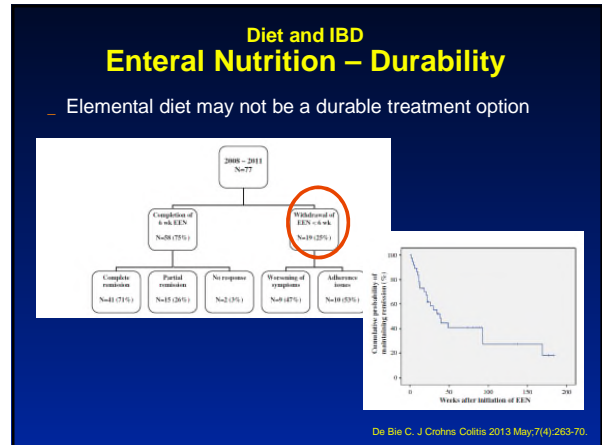
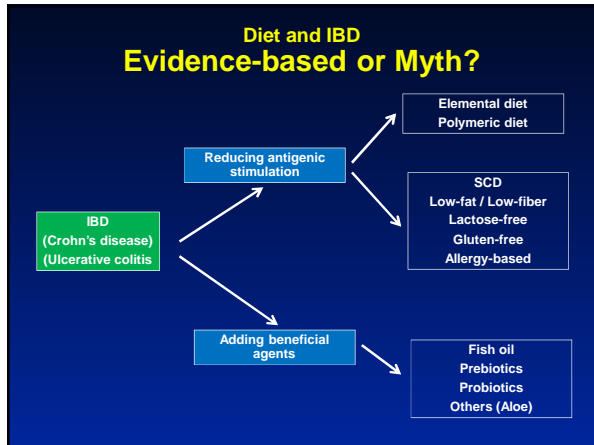
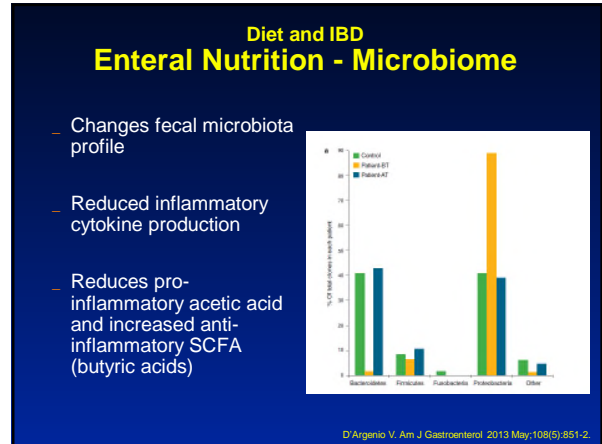
### Diet and IBD Components of an anti-IBD diet?

Direction	Crohn's disease	Ulcerative colitis
<b>Reduced Risk</b>	Fiber	Long-chain n-3 PUFA
	Fruits and Vegetables	
	N-3 PUFA (pediatric)	
	Zinc	
	Vitamin D	
<b>Increased risk</b>	Sugar	Animal protein
		N-6 PUFA
		Total carbohydrates
		Sulfur, Iron

### Diet and IBD What about diet and relapse?

Food Items	CD (n=1121) (B, W)	UC (n=597) (B, W)
<b>Improved Symptoms</b>		
Yogurt	108, 7*	54, 3*
Rice	59, 3*	30, 3*
Bananas	NR	NR
<b>Worsened Symptoms</b>		
Non-Leafy Vegetables	28, 221*	29, 81*
Spicy Foods	1, 145*	3, 79*
Fruit	50, 136*	40, 63
Nuts	3, 120*	1, 33*
Leafy Vegetables	6, 115*	2, 50*
Fried Foods	0, 105*	0, 53*
Milk	6, 105*	0, 49*
Red Meat	6, 103*	7, 47*
Soda	11, 99*	0, 46*
Popcorn	2, 97*	NR
Dairy	3, 94*	1, 56*
Alcohol	0, 90*	0, 54*
High Fiber	19, 87*	19, 35†
Corn	0, 77*	0, 31*
Fatty Foods	0, 62*	NR
Seeds	NR	NR
Coffee	NR	4, 37*
Beans	NR	5, 30*

B = better, W = worse  
Cohen AB Dig. Dis. Sci. 2012



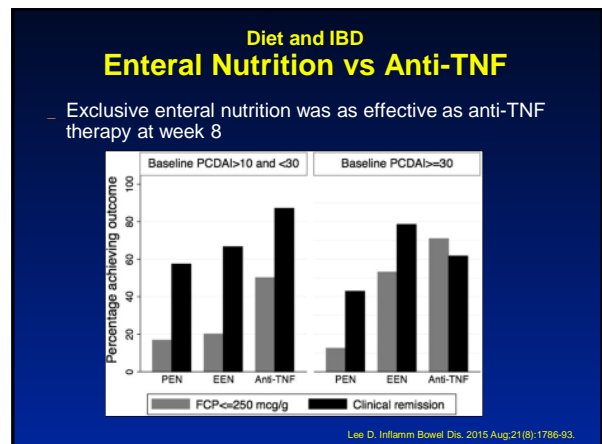
### Diet and IBD Enteral Nutrition - Evidence

- Enteral nutrition for induction of remission in CD
- Consensus: Not as effective as corticosteroids

Study	No. of patients		Time of enteral nutrition (weeks)	Patients achieving remission (%)		Difference in remission rate (95% CI)	Odds ratio (95% CI)	Response to EN (2 patients)	
	EN	Steroids		EN	Steroids				
EN vs corticosteroids									
Levine et al. <sup>10</sup>	55	52	4	CDM	53	45	-8	0.32 (0.01-3.96)	13
Mahboob et al. <sup>11</sup>	53	44	6	CDM	41	71	-30	0.28 (0.13-0.62)	20
Reinisch et al. <sup>12</sup>	15	17	4	EN	80	89	-9	0.52 (0.09-3.05)	0
Ullrich et al. <sup>13</sup>	9	30	4	CDM	22	50	-28	0.32 (0.09-1.09)	33
Griffiths et al. <sup>14</sup>	22	26	4	EN	42	46	-4	0.91 (0.09-9.99)	41
O'Mahony et al. <sup>15</sup>	13	32	4	EN	82	80	+2	1.13 (0.13-9.40)	56
Reinisch et al. <sup>16</sup>	30	9	5	CDM	80	97	-17	1.52 (0.26-8.96)	0
Seidman et al. <sup>17</sup>	40	38	8-8	CDM	75	70	+5	0.58 (0.12-3.25)	8

EN 40-70%      Steroids 70-90%

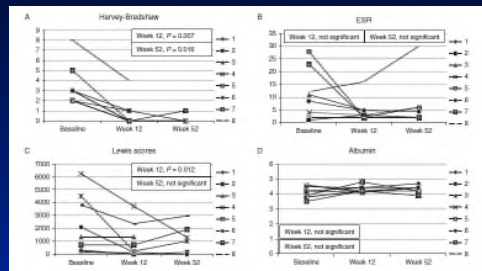
Griffiths AM. Gastroenterology 1995 Apr;108(4):1056-67.



## Diet and IBD Specific Carbohydrate Diet

- Originally developed by Sidney Hass as a treatment for celiac disease
- Exclude complex carbohydrates from the diet
- Interest in IBD began after anecdotal report of improvement in a case of UC (Elaine Gottschall) → "Breaking the vicious cycle"

## Diet and IBD Specific Carbohydrate Diet



Cohen SA. J Pediatr Gastroenterol Nutr. 2014 Oct;59(4):516-21.

## Diet and IBD Specific Carbohydrate Diet

- **Exclude:** All grains, starchy tubers, bread and starchy foods, canned and processed meats, canned vegetables, lactose containing foods including milk
- **Include:** Unprocessed meats, fish, some legumes (lentils, split peas), fresh or frozen raw or cooked vegetables and fruits, honey

## Diet and IBD Paleo Diet

- Introduced in 1975
- "The human gut is poorly evolved to handle diet from modern agricultural methods" → hence modern diseases
- **Emphasis:** Lean, non-domesticated meats, non-cereal plant-based foods (Fruits, roots, legumes, nuts)
- Low n-6:n-3 ratio (2:1)
- Approximately 30-35% of caloric intake from lean protein
- **High fiber intake: 45-100g/day**
- Avoid all dairy (monitor for vitamin D deficiency)

**No evidence of benefit in IBD**

Hou JK. Clin Gastroenterol Hepatol. 2013 Oct 6.

## Diet and IBD Specific Carbohydrate Diet

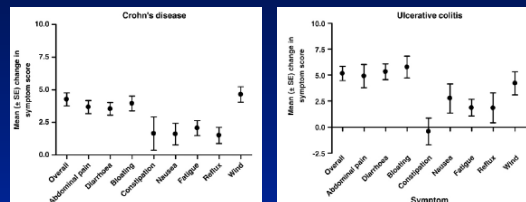
### Nutritional Therapy in Pediatric Crohn Disease: The Specific Carbohydrate Diet

- Seven children treated with SCD
- Duration of therapy 5-30 months
- All had resolution of symptom within 3 months
- Improvement of fecal calprotectin in 4 patients

Suskind DL. J Pediatr Gastroenterol Nutr 2014 Jan;58(1):87-91.

## Diet and IBD FODMAP diet

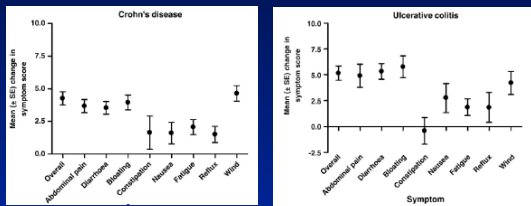
- Reduced intake of poorly absorbed carbohydrates → reduced bacterial overgrowth
- Similar to the SCD except for fruits and vegetables
- 72 IBD patients (52 CD) given dietary instructions



Gearty RB. J Crohns Colitis. 2009 Feb;3(1):8-14.

### Diet and IBD FODMAP diet

- Reduced intake of poorly absorbed carbohydrates → reduced bacterial overgrowth
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Geary RB. J Crohns Colitis. 2009 Feb;3(1):8-14.

### Diet and IBD Crohn's disease exclusion diet

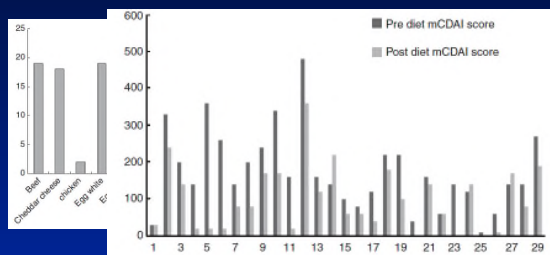
- Israeli group: 47 patients with active CD x 12 weeks
- 50% of calories from polymeric formula
- 50% from exclusion diet: Excluded gluten, dairy, gluten-free baked goods and breads, animal fat, processed meats, emulsifiers, canned goods and all packaged products. Includes 18-20g fiber per day.

	Baseline	Week 6	
HBI	6.4	1.9	< 0.001
PCDAI	28	5	< 0.001
CRP	2.9	0.9	< 0.001
ESR	29.3	17.0	< 0.001
Hemoglobin	12.2	12.3	0.5

Sigall-Borush R. Inflamm Bowel Dis. 2014 Aug;20(8):1353-60.

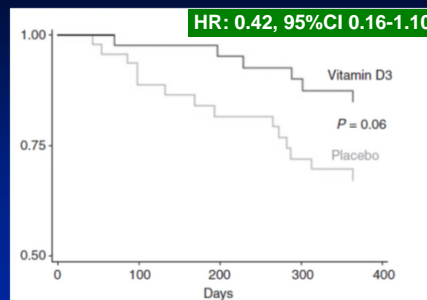
### Diet and IBD Allergy-based diet

- 40 patients with symptomatic CD → sera tested for IgG4 to 14 specific food antigens → 4 most reactive fluids excluded for 4 weeks
- 29 / 40 patients completed the study; 90% reported improvement



Rajendran N. Colorectal Dis 2011 Sep;13(9):1009-13.

### Diet and IBD Vitamin D as a treatment



Jorgensen SP. Aliment Pharmacol Ther. 2010 Aug;32(3):377-83.

### Diet and IBD IBD-Anti-inflammatory diet

- Case series of 27 consecutive patients with IBD
- Diet: Series of phases of exclusion of foods
  - Can eat: Lean meats, poultry, fish, omega-3 eggs, select fruits and vegetables, nut and legume flours, fresh cultured yogurt, honey, prebiotics (soluble fiber).
  - Modifies texture (start with soft or pureed foods). Avoid stems and seeds.
- Results: 24 patients had good or very good response.
- Among 11 patients with disease activity scores – all were able to discontinue at least one prior IBD medications.
  - ΔHBI: -9.5 (11→1.5)
  - Δ MTLWSI: 7 (7→0)

Olezenki BC. Nutr J. 2014 Jan 16;13:5.

### Diet and IBD Summary of evidence

Diet	Improves symptoms (case series)	Improves inflammation (case series)	RCT evidence of efficacy
Elemental Diet	+	+	+
SCD	+	+	No
Gluten free diet	+	No	No
FODMAP diet	+	No	No
Paleo diet	No	No	No
Vitamin D	No	? +	? +
n3 PUFA	? +	? +	? -
CD exclusion diet	+	+	No
IBD-AID	+	No	No

## Diet and IBD False dichotomy



## Diet and IBD Summary

- Diet plays a role in disease pathogenesis and relapse but influences appear heterogeneous
- Limited data on efficacy of dietary changes are primary therapy for induction or maintenance of remission
- Stay tuned!

