

The Connection Between Diet, Nutrition, & IBD

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Today's Objectives

- ▶ Understand the importance of diet and nutrition in inflammatory bowel disease (IBD)
- ▶ Outline dietary strategies that are helpful in controlling IBD symptoms during a flare.
- ▶ Discuss complementary nutritional therapies

Importance of Diet & Nutrition

- ▶ Diet and nutrition are important parts of IBD management
- ▶ Diet is the actual food that is consumed
- ▶ Nutrition refers to the process of providing or obtaining the food needed for health and growth.
- ▶ Incorporating nutritious food into the diet is essential

Nutrition for the IBD Patient:

- ▶ Nutritional Goals are the same for both Crohn's and Ulcerative Colitis.
- ▶ Goal: Reduce inflammation and bowel irritation through nutritionally rich foods that nourish and heal the bowel.

Nutritional Complications:

- Nutrient deficiencies due to malabsorption.
- Dehydration.
- Weight loss, bone loss, muscle loss.
- Soft or liquid diet for strictures of the bowel.
- Need for surgery/ostomies.

Nutritional Deficiencies:

IBD can cause poor digestion/absorption of carbohydrates, protein, fat, water, and a variety of vitamins and minerals.

Limited diet and low appetite can also lead to poor nutrition.

Most common deficiencies:

- Vitamin B12
- calcium
- Vitamin D
- iron
- protein
- folate/zinc

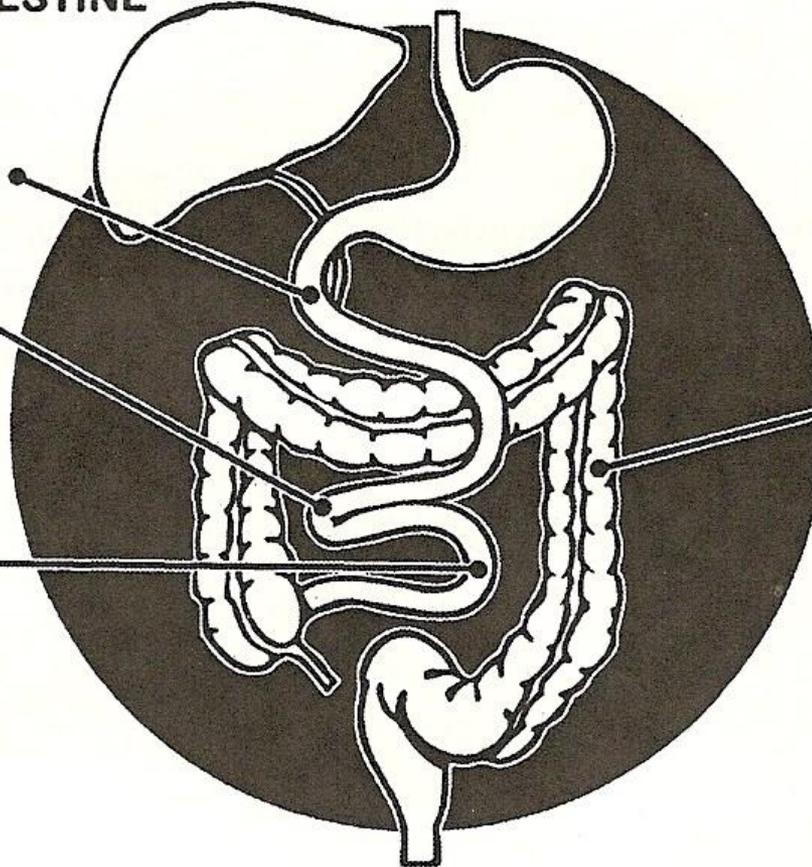
MAJOR ABSORPTIVE SITES IN THE GI TRACT

SMALL INTESTINE

DUODENUM-
Iron, Calcium,
and Magnesium

JEJUNUM-
Carbohydrates
(Sugars),
B Vitamins,
Vitamin C and
Protein
(Amino Acids)

ILEUM-
Vitamins A, D, E, K,
Fat, Bile Salts,
B12, and
some minerals



LARGE INTESTINE

COLON-
Potassium,
Sodium, Water,
(Formation
of Vitamin K)

Effects of IBD on Digestion/Absorption

- **Crohn's Disease:**

- Inflammation or surgical resection of small intestine decreases ability to absorb nutrients.
- Malabsorption of micro nutrients, protein, fat, carbohydrate, fat soluble vitamins A,D,E,K can occur.
- Incompletely digested foods that travel through the colon may also cause diarrhea.
- Diarrhea and loss of appetite also contribute to nutrient deficiencies.

Cont...

- Ulcerative Colitis:
 - Small intestine works normally. However since diarrhea can be rapid and severe small intestine may not have time to absorb nutrients from food.
 - Inflammation of large intestine causes poor water absorption and diarrhea with possible electrolyte imbalances and decreased vitamin K production.
 - Pain can contribute to loss of appetite and poor nutrition.
 - Blood loss may be severe and iron deficiency anemia is common.

Vitamin/Mineral Supplementation:

- Multivitamin/mineral recommended.
- Calcium - 1200-1500mg daily. (Steroids increase needs).
- Vitamin D 1200-2000IU daily.
- (Study showed CD in remission 13% relapse after 1 year with Vitamin D vs 29% placebo) Jorgensen SP, Aliment Pharmacol Ther 2010
- Vitamin B12 - 1000mcg monthly injection (Crohn's ileal disease).
- Iron - 325mg 1-3 times daily. (If anemia present).
- Folic acid 1000micrograms daily (as needed).

Nutritional Supplementation:

Oral liquid nutritional supplements:

- *Commercial i.e. Ensure, Boost, Kate Farms, Orgain
- *Homemade protein drinks and smoothies.

Enteral Nutrition - Tube Feeding:

- *Formula administered through a feeding tube i.e. Osmolite, Jevity, Peptamen, Vital, Vivonex, Liquid Hope, Compleat, Real Food

Parenteral Nutrition or TPN:

- *Prolonged uncontrolled diarrhea
- *Ileus/bowel obstruction
- *Small bowel fistula
- *Short Bowel Syndrome

Diet and IBD

- Good nutrition is important to help restore and maintain good health.
- Diet can help reduce symptoms while the disease is being treated in other ways i.e. medications, surgery.
- NO one single diet is right for all IBD patients.
- More research on special diets is needed.
- Diet should be tailored individually to meet patient nutritional needs, food preferences, and lifestyle.

Diet recommendations vary according to:

Part of GI tract affected

Presence of strictures

Disease state - remission vs. flare.

Weight loss

Anorexia

-Important to work with a Registered Dietitian that can complete thorough clinical assessment of symptoms, medications, nutritional parameters, lifestyle, diet preferences, and nutrient requirements: calories, protein, vitamins and minerals.

Diet & Risk of Developing IBD

- ▶ High intake of sugar and soft drinks
- ▶ Low intake of vegetables
- ▶ High intake of animal protein and processed meats
- ▶ Food additives : maltodextrin, emulsifiers, thickeners i.e. carrageenan
- ▶ High intake of omega 6 polyunsaturated fatty acids (meat, cooking oil)

A Randomized trial of the effects of the no-carrageenan diet on UC disease activity' Sumit Bhattacharyya et al Nutr Healthy Aging 2017, 4(2) 181-192.

Dietary Intake & Risk Development of IBD: Systematic Review of the Literature. Hou JK, AM J Gastroenterology 2011;106, 563-573

Possible ways diet can affect inflammation:

- ▶ Encourage/discourage growth of particular species of bacteria in the gut (Gut microbiome)
- ▶ Promote certain metabolic pathways to be active in commensal organisms.
- ▶ Reduce the mucus layer, allowing closer interaction of microbiota with the host immune system
- ▶ Direct toxin? Does some component of food injure the epithelium?

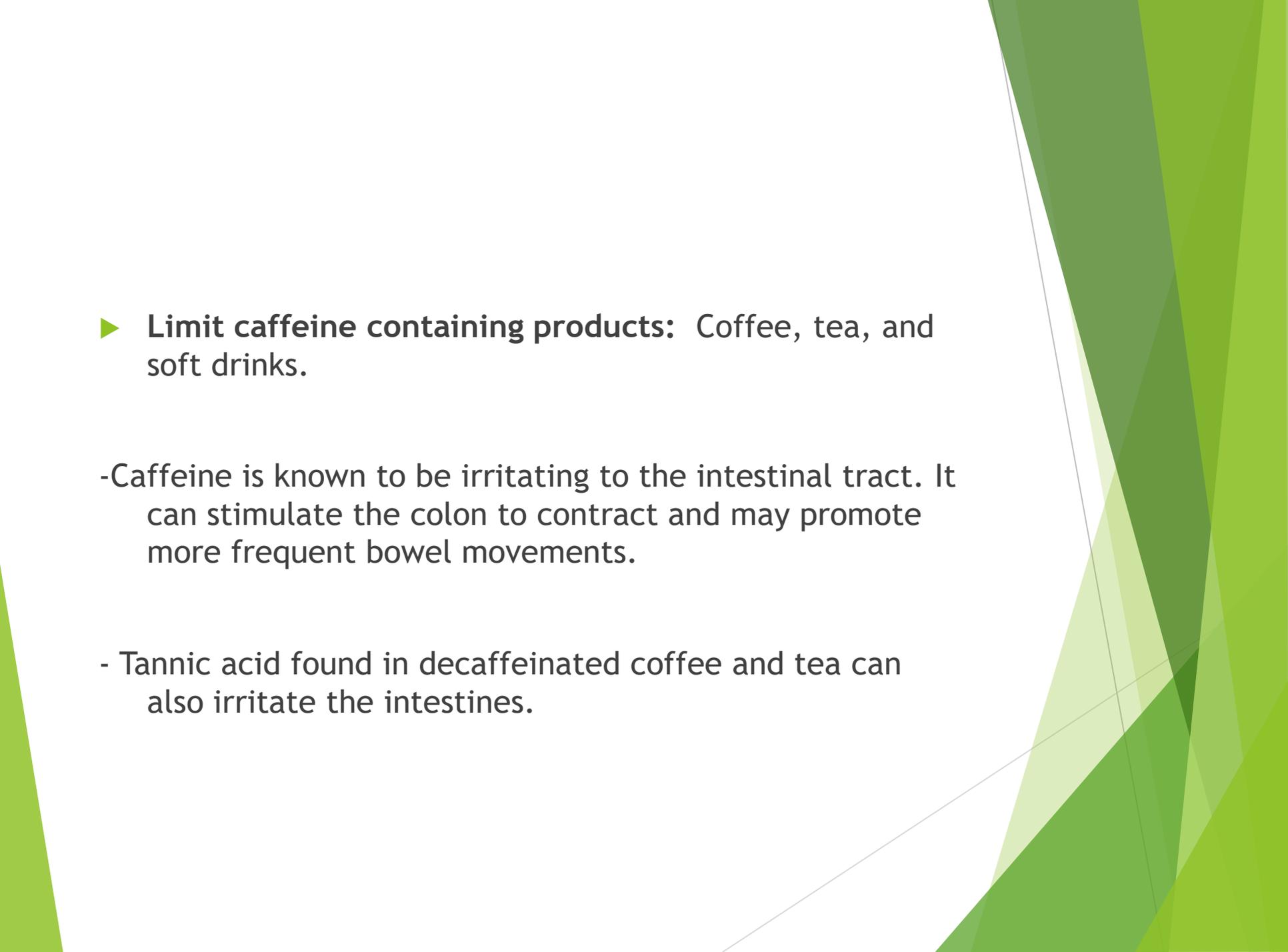
Foods that may worsen symptoms:

▶ Lactose and dairy products:

- If lactose intolerant limit the intake of foods like milk, ice cream, cheese, and yogurt.
- Try lactase fortified products like Lactaid brand milk or take lactase enzymes prior to meal containing lactose.
- A1 vs A2 milk
 - Use other calcium fortified foods to increase calcium intake such as fortified soy, almond, coconut, hemp, or rice milk, fortified fruit juices.
 - A calcium supplement with vitamin D may be prescribed.

► **Greasy or fatty foods:**

- May cause diarrhea, gas, or nausea, or fat malabsorption.
- Limit intake of butter, margarine, cream sauces, cheeses, pastries, fried foods, and high fat cuts of meat such as bacon, sausage, or ribs.



► **Limit caffeine containing products:** Coffee, tea, and soft drinks.

-Caffeine is known to be irritating to the intestinal tract. It can stimulate the colon to contract and may promote more frequent bowel movements.

- Tannic acid found in decaffeinated coffee and tea can also irritate the intestines.

▶ **Other food commonly linked with symptoms:**

- ▶ Spicy food
- ▶ Alcohol
- ▶ Raw fruits/vegetables
- ▶ Carbonated beverages
- ▶ High sugar food
- ▶ Popcorn
- ▶ Red meat

*Limdi JK et al Inflamm Bowel Dis 2016;22(1):164-170.

Fiber

- ▶ Low Fiber diet is most commonly prescribed diet.
- ▶ Low fiber diets have NOT shown a definite benefit to control disease or inflammation.
- ▶ Patients often correlate increase symptoms of pain and diarrhea with high fiber diet, especially insoluble fiber.
- ▶ Study: Cohen, AB et al. 'Dietary patterns and self reported associations of diet with symptoms of IBD'. Dig Dis Sci. 2012 May, 58(5)

▶ .

- ▶ However....some studies suggest fiber may not be bothersome to all.
- ▶ A 2014 study reviewed 23 trials over a 10 year period (1296 patients)
- ▶ In greater than 50% of the studies patients with CD reported that dietary fiber had no effect on their symptoms.
- ▶ 3 of 10 studies showed that fiber supplementation reduced number and severity of flares.
- ▶ *Wedlake L, et al Inflamm bowel dis 2014;20(3):576-586.

Fiber: Insoluble vs. Soluble

Insoluble Fiber:

- Does not mix with liquids and passes through the GI tract mostly intact.
- May increase diarrhea, gas, bloating, and abdominal pain.
- Insoluble fibers include the skin, seeds, and strings of fruits and vegetables.

Sources: cellulose, bran, wheat products, whole grains, vegetables, fruits with edible seeds

Cont...

Soluble Fiber:

- Forms a gel when mixed with liquid and aids in bulking and moving food through the gut. May reduce diarrhea.
- Smoother consistency moving through the bowel.
- The inside flesh of fruits and vegetables often high in soluble fiber.

Sources: gums, oats, legumes, guar, barley, pectin, apples, citrus, strawberries, carrots.

- ▶ Hummus*
- ▶ Refried beans (smooth)*
- ▶ Pea soup*
- ▶ Instant oatmeal
- ▶ Peeled or canned pears
- ▶ Baked apples or applesauce
- ▶ Peeled plums
- ▶ * Gas forming (Bean-o may be helpful)

Fiber cont...

- ▶ Recommendation: Include as much fiber as tolerated especially soluble fiber.
- ▶ Some fibers act as pre-biotics: food for probiotics.
- ▶ Fiber will not make IBD inflammation worse, but can aggravate symptoms like gas, bloating, abdominal pain, and diarrhea.
- ▶ Fiber should be limited during a flare or if strictures present.

Diet during a flare:

- Eat smaller meals more often. Four to six small meals may be easier for the intestines than two to three large ones.
- Food choices should be high in calories, vitamins, protein.
- Intake of high fiber foods should be limited if they cause symptoms.

- If stricture present avoid nuts, seeds, corn, popcorn, stringy vegetables. (approx. 2/3 of CD pts w/ small bowel disease).
- Restrict fat if fat malabsorption present (approx. 1/3 of CD pts)
- Elimination Diet or Liquid Diet as needed.

Best foods during a flare:

- Milk & Substitute Group:* nonfat milk, reduced fat cheeses i.e. 1% cottage cheese, part skim mozzarella, sherbet, low fat frozen yogurt, reduced fat yogurt, calcium fortified rice, coconut, hemp, almond, or soy milk, A2 milk.

*(Lactaid may be helpful in those with Lactose intolerance)

- Meat & Substitute Group: fish, (especially oily fish i.e. salmon) water packed tuna, shellfish, eggs, chicken, turkey, lean ground beef (grass fed) tofu, beans*, lentils*
- *May need to pureed into soups or refried beans/hummus.
- *If gas forming - try Beano

Foods Cont...

- ▶ Vegetables: canned or well cooked: asparagus tips, beets, cauliflower*, broccoli*, winter squash i.e. butternut, zucchini, mushroom, carrots, pumpkin, white potato, sweet potato, tomato sauce, tomatoes without seeds or skin, vegetable juices. Soups, dips.
- ▶ Caution with thick skinned or stringy vegetables and those that cause gas production*. Lettuce, spinach, and other greens may be tolerated in small amounts.

Foods Cont...

- ▶ Fruits: Choose canned or cooked fruits without skins or seeds i.e. fruit juice without pulp, canned fruits like apricots, applesauce, mandarin oranges, peaches, pears, or raw bananas, soft seedless melon, papaya, mango, and peeled pears, plums, or peaches.
- ▶ Avoid raw apples, berries, dried fruit, oranges, kiwi, pineapple. (OK to blend in smoothies and strain out seeds and skins).

Foods Cont...

- ▶ Grain Group: white bread i.e. enriched french or sour dough, potato, sweet potato without skin, instant oatmeal, seedless rye bread, white enriched pasta, white rice, instant brown rice, couscous, saltine crackers, rice crackers, water crackers, Cheerios, Rice Krispies, Rice Chex, Kix, Life, puffed rice, cream of wheat or rice, and fortified cereal i.e. Total.
- ▶ Caution with whole grains, bran, granola, quinoa, whole wheat crackers, breads with nuts or seeds.
- ▶ If you opt out of the grain group i.e. SCD or Gluten Free be sure to add carbohydrate rich fruits, vegetables and legumes as tolerated.

What about “FODMAPS”

- ▶ Folks with IBD often have symptoms of IBS (Irritable Bowel Syndrome)
- ▶ “FODMAPs” (Fermentable Oligo, Di- and Mono-saccharides and Polyols) can aggravate IBS symptoms.

FODMAPS are: Fructose, Lactose, fructans, galactans, polyols i.e. sugar alcohols: sorbitol, mannitol, isomalt, xylitol.

- ▶ FODMAPS cause Food intolerance not Food Allergy

High FODMAP Foods:

- ▶ Fruits: apples, pears, mango, watermelon, blackberries
- ▶ Vegetables: onions, garlic, snap peas, asparagus, cauliflower, mushrooms, broccoli, beets
- ▶ Grains: wheat, barley, rye, pasta, bread, cookies, cake
- ▶ Lactose: milk, yogurt, kefir, cottage cheese, ice cream*
- ▶ Honey, agave, chicory root/inulin

**Most cheeses are low lactose

Low FODMAP Foods:

- ▶ Fruit: banana, blueberries, strawberries, cantaloupe, oranges
- ▶ Vegetables: lettuce, green beans, carrots, tomato, potatoes, sweet potatoes, spinach
- ▶ Grains: oatmeal, quinoa, rice, corn
- ▶ Meats, Fish, Poultry - all OK
- ▶ Milk group: Most cheese ok
- ▶ Other: almond milk, coconut milk, maple syrup, sugar (small amounts)

FODMAPS

- ▶ Follow FODMAPs elimination diet for 1-2 weeks
- ▶ Assess symptoms: same, better, worse?
- ▶ Challenge each FODMAP group one at a time
- ▶ FODMAP tolerance often portion dependent
- ▶ Find your individual FODMAP threshold
- ▶ Important to work with a Registered Dietitian to ensure best results and help maintain nutritional status while eliminating foods from diet

Is There a Special Diet to Cure IBD?

- ▶ Several diets advertised specifically for managing IBD
- ▶ Many claims are supported by small numbers of subjects or patient testimony
- ▶ Most have not been proven scientifically and benefits have not been seen in formal studies.

Is There a Special Diet to Cure IBD?

- ▶ The Specific Carbohydrate Diet (SCD)
- ▶ Developed in the 1930's and popularized by Elaine Gottschalls book 'Breaking the Vicious Cycle'.
- ▶ SCD excludes all grains, sugars, except honey, processed foods and milk. Considered "illegal".
- ▶ SCD claims that decreased carbs reduce intestinal inflammation by restoring the balance of bacteria within the bowels.

SCD Pros:

- ▶ A number of studies evaluating SCD have shown clinical improvement and decreases in intestinal inflammation.
- ▶ Seattle Children's leading the way with research on SCD*:
 - ▶ 5-10% (80-100 patients) following SCD
 - ▶ 30-40% of the SCD'ers are on No Meds.
- ▶ Less research in Adults
 - DINE-CD Trial of Specific Carbohydrate and Mediterranean Diets to Induce Remission in Crohns Disease (CCFA and PCORI)

*Suskind DL, et al, JPGN. 2014 Jan;58(1):87-91.

SCD Cons:

- ▶ Very restrictive
- ▶ Confusing without clear guidance of how or when to liberalize diet.
- ▶ High fiber/residue foods may increase symptoms of pain and diarrhea.
- ▶ Should **NOT** be chosen in favor of medication therapy in cases of moderate to severe inflammation.
- ▶ May not be good choice for those with malnutrition
- ▶ Discuss SCD with doctor and seek help from a Registered Dietitian familiar with SCD before starting.

SCD Resources

- ▶ ‘Breaking the Vicious Cycle’ Elaine Gottschall, BA, N.Sc. www.breakingtheviciouscycle.info
- ▶ ‘Nutrition in Immune Balance’ (NiMBAL), David Suskind, MD www.nimbal.org
- ▶ Website: www.pecanbread.com
- ▶ Support Groups/Social Media

Anti-inflammatory Diet for IBD

- ▶ Based on SCD
- ▶ Encourages use of omega-3 fatty acids
- ▶ Utilizes food-based prebiotics and probiotics
- ▶ Includes some SCD “illegal” foods such as oatmeal, soy milk, flax and chia seeds, hummus. (Rice?)

- ▶ **Studied in adults At Univ Massachusetts
- ▶ 100% of pts able to decrease meds. 100% had reduced symptoms including bowel frequency

An anti-inflammatory diet as treatment for inflammatory bowel disease: a case series report. Olendski, B et al Nutr J 2014;13:5.

Exclusive Enteral Nutrition is equivalent to steroids for pediatric IBD.

- ▶ Exclusive Enteral Nutrition (EEN) (100% formula)
- ▶ Participants given formula for 8-12 weeks
- ▶ Equivalent remission rates with EEN vs steroids
- ▶ EEN better than partial enteral nutrition (PEN)
- ▶ EEN superior to steroids in achieving mucosal healing

▶ Dziechciarz P, Aliment Pharmacol Ther 2007

▶ Borrelli O, Clin Gastroenterol Hepatol 2006

Crohns Disease Exclusion Diet (CDED)

- ▶ Goal to reduce intake of foods which may cause intestinal inflammation and alter the gut microbiome or alter the mucous layer in the gut.
- ▶ Include: fruits, vegetables, meats, carbohydrates.
- ▶ Avoid: gluten, gluten free baked goods, dairy products, animal fats, processed meats, emulsifiers, canned goods, pre-packaged convenience foods.
- ▶ Remission in 70% of children and 69% of adults
- ▶ Reduction of CRP in 21/30 (70%)

*Sigall—Boneh R et al Inflamm Bowel Dis 2014;20(8):1353-1360

Semi-vegetarian Diet in CD

- ▶ Semi-vegetarian Diet:
- ▶ Meat once every 2 weeks
- ▶ Fish once a week
- ▶ Dairy, eggs, fruits, vegetables, legumes, brown rice, and potatoes daily.
- ▶ Patients on semi-vegetarian diet were less likely to relapse after 2 years
- ▶ Evaluated on symptoms only (no EGD eval)
- ▶ Chiba, M et al World J Gastroenterol 2010;16(20):2484-2495

Gluten Free Diet

- ▶ CCFA Partners survey: 1647 patients.
- ▶ 19% of participants had tried a gluten free diet
- ▶ 8.2% currently following gluten free diet.
- ▶ 65.6% reported improvement in symptoms
- ▶ 38.3% reported fewer or less severe flares of IBD
- ▶ Improvement of fatigue was reported.

- ▶ Herfarth, HH et al *Inflamm Bowel Dis* 2014;20(7):1194-1197

Other therapies:

- Probiotics: pills vs. fermented foods.
- Good bacteria that restore balance to the intestines
- VSL#3 best studied probiotic in IBD. May improve pouchitis and may help treat mildly active UC and prevent relapses.
- No conclusive studies for CD

Derwa Y et al Aliment Pharmacol Ther 2017;46(4):389-400

Probiotic Food Sources

- ▶ Yogurt
- ▶ Kefir
- ▶ Kombucha & probiotic drinks i.e. Kevita
- ▶ Sauerkraut & other fermented vegetables
- ▶ Tempeh
- ▶ Miso
- ▶ Fermented cheese

Other therapies:

- ▶ Curcumin (turmeric and ginger)

Small study: Less relapse in UC patients using 1 gram curcumin after Breakfast and Dinner

- ▶ Omega 3 fatty acids - fish oil supplements

- ▶ Studies: Mixed results.

* Food sources: salmon, tuna, shellfish, halibut, flax seeds, flax oil, pumpkin seed, omega 3 eggs, grass fed beef.

‘Curcumin has bright prospects for the treatment of IBD’ Hanai et al Curr Pharm Des 2009;15(18):2087-94.

Omega 3 free fatty acids for the maintenance of remission in CD: the EPIC randomized controlled trials. Feagan, BG et al. JAMA 2008 Apr 9 ;299(14) 1690-7

Putting it all together:

- Eat healthy, nutrient rich foods that are easily digested.
- Experiment to determine foods that work for you.
- Include foods high in protein.
- Include calcium rich foods.
- Include omega 3 rich foods.
- Reduce portions of meat, especially processed meats.

- Include fiber as tolerated, especially soluble fiber.
- Choose antioxidant rich foods.
- ▶ Drink 8 to 12 cups of fluid to maintain hydration.
- ▶ Consume adequate calories to maintain weight.
- ▶ Choose minimally processed foods most of the time.
- ▶ Add anti-inflammatory spices to food.

- ▶ Take supplements to replace lost nutrients as needed.
- ▶ Work with MD and RD to design comprehensive treatment plan.
- ▶ Adjust diet to symptoms i.e. low FODMAPS, low fiber
- ▶ Consider alternate diets such as SCD or AID
- ▶ Research Studies: [ClinicalTrials.gov](https://clinicaltrials.gov), CCFA DINE-CD
- ▶ Connect with others: Social media, support groups

Thank You!

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Other References:

-Crohn's and Colitis Foundation of America inc.

www.ccfa.org

-"What to Eat with IBD" by Tracie Dalessandro, MSRD

-Nutrition Issues in Gastroenterology, Series #31 & #53

Carol Rees Parrish, RD, MS

www.medicine.virginia.edu

-"The IBS Elimination Diet and Cookbook" by Patsy Catsos,
MSRD

-'Fresh and Fermented' Julie O'Brien & Richard Climenhage
(Firefly Kitchens)