

3 NATURAL STRATEGIES FOR CROHN'S AND ULCERATIVE COLITIS

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PART 3

OMEGA 3s

What Are Omega 3s?

Omega 3s and omega 6s are both types of polyunsaturated fats (PUFAs). Polyunsaturated means that the fatty acid has 2 or more “double bonds”.

Because of these double bonds, both omega 3s and omega 6s are prone to oxidative damage. However, **omega 3s can actually decrease the overall amount of oxidation** occurring in the body and in the colon.^{3,4,5}

Omega 3s accomplish this by increasing our cells’ own antioxidant defense mechanisms, so that the body is better able to fight off and deal with any oxidative stress.^{4,5,6,7}

Omega 6s are generally pro-inflammatory, while omega 3s are generally anti-inflammatory.

Omega 3s and 6s are “precursors” for prostaglandin pathways. Prostaglandins are one class of molecules in the body that is responsible for creating inflammation, however not all prostaglandins are “bad”.

NSAIDs such as ibuprofen, Advil, etc. work exclusively by shutting down virtually all prostaglandin production.

In our modern diet, we get a TON more omega 6 than omega 3. This is because how cheap it is to produce vegetable oils filled with omega 6. Most junk food, processed and packaged food, and food cooked in restaurants use omega 6 vegetable oils. Even the meat that we consume is now filled with omega 6 because of what the animals are being fed (we evolved with our meat containing omega 3s from the animals eating grass).

*“In 1909, the average American consumed about **9.5 grams of omega-6 per day**, representing **2.79% of our daily calories**. Ninety years later, in 1999, our omega-6 intake was 24.6 grams per day. Today, because of our increased consumption of omega-6-rich vegetable oils, we’re consuming closer to **40 grams of omega-6 per day**. That means that **over 10% of our calories** now come from a single type of fatty acid: omega-6.”¹⁵*

This internal imbalance between omega 6s and 3s sets the stage for our bodies to be more likely to become chronically inflamed.

While omega 6s tend to perpetuate inflammation, omega 3s can actually help inflammation **resolve** (one class of molecules that omega 3s can turn into are called “resolvins”).

Thus, increasing our omega 3 to omega 6 ratio is a great, simple strategy for helping to improve the chronic inflammation in Crohn’s and U.C.!

Omega 6 to 3 ratio in Rodents

Let's take a look at a study in which researchers gave rats a chemical that induces colitis in rats (DSS) and then gave the rats a diet in which the omega 6:3 ratio was either 215, 50, 10, or 2.¹ (*Picture below*)

Importantly, the omega 3 they used was the plant-based ALA, which comes primarily from flaxseed oil, not fish oil.

Most nutritionists believe that a ratio of omega 6:3 of 2 is ideal. Most people in developed countries consume a much higher ratio.



This image shows the colon of the rats in the different groups. CON-215 is the control group that did not have colitis. All the DSS groups had colitis, and the number after the DSS is the omega 6:3 ratio.

As you can see, the colon of the DSS-215 rat looked inflamed, swollen, and shorter. This is what severe colitis looks like. Every time the 6:3 ratio was lowered, the colon looked better and better. When the 6:3 ratio was "2", the colon appeared nearly just as healthy as the control group without colitis!

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Importantly, the “type” of omega 3 that was used in this study was alpha-linolenic acid (ALA), the plant form of omega 3 that usually comes from flaxseed (but also from ground chia, walnuts, hempseed, and grass fed meat). We’ll get more into the different “types” in a moment.

While we can’t form any conclusions based off of one study, it does mean that we should look further into the effects of omega 6s and 3s on colon inflammation, considering the huge effects on these rats.

Omega 6s and Omega 3s

In my online course, “Ultimate Freedom from Crohn’s and Colitis”, we dive a lot deeper into how to lower omega 6s in your diet (because they are found in almost everything nowadays).

In this short video series, we are only going to have time to focus on how to increase your omega 3 intake - and what the best type of omega 3 to consume is!

Be aware though, the research clearly shows that the best results will be gotten by increasing your omega 3 **AND** decreasing your omega 6 intake. The ratio is very important.

Types of Omega 3s

There are two different types of omega 3s: Plant and animal/fish omega 3s

- **Plant omega 3s** include primarily flaxseed, chia, walnuts, hempseeds, and grass fed meat, which have **ALA** (alpha-linolenic acid) in them.
- **Animal omega 3s** include primarily fish and cod liver oil (though algae oil is now another option) which have **EPA and DHA** in them.

While most people automatically are told that fish oil is better than flaxseed oil, this is based on the **outdated concept** that the prostaglandins are the only thing responsible for inflammation.

We now know that there are other metabolites of omega 3s and 6s - called **oxylipins** - that drastically influence the inflammatory response.⁸

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- Both fish oil and flaxseed oil directly generate their own distinct oxylipins.
- Oxylipins from omega 3s are anti-inflammatory, while those from omega 6s are generally pro-inflammatory
- Flaxseed oil can inhibit an enzyme called “soluble epoxide hydrolase” which is responsible for creating mainly pro-inflammatory oxylipins.² Thus, flaxseed oil helps to “shut down” the generation of pro-inflammatory oxylipins!

Thus, let's look at what the research actually shows about fish oil vs. flaxseed oil for Crohn's and U.C.!

Human Studies With Fish Oil for Crohn's and U.C.

- A 2014 large Cochrane Systematic Review found that fish oil was largely **ineffective** at maintaining remission in Crohn's Disease. 37% of patients in the n-3 group relapsed at 12 months compared to 42% of placebo patients, which was statistically insignificant.⁹
- A 1996 study also showed that 5g/day of concentrated fish oil was **not able** to prolong remission in Crohn's Disease patients.¹⁰
- A 2005 study in kids with Crohn's Disease (average age was 10 years old) showed that 3g per day of fish oil in “gastro-resistant capsules” as an add-on to mesalazine **was able** to significantly prolong the time the kids stayed in remission over two years compared to mesalazine alone.¹¹
- A 2011 Systematic Review and Meta-Analysis found **no clinical benefit** for fish oil for maintaining remission in both Crohn's and U.C.¹²

So far, it's not looking too good for fish oil... as many patients with Crohn's and U.C. have found out themselves.

However, there are two very interesting studies that point us in a slightly different direction:

- A diet with an omega 6:3 **ratio** of 2 (i.e. relatively high in omega 3s, lower in omega 6 compared to usual diets) **was able** to reduce CRP, allow Crohn's patients to wean off of an elemental diet without a flair up, and **significantly prolong the time the patients were able to stay in remission**.¹³

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- While not a human study, a very important rodent study was performed which induced experimental Crohn's Disease in rats and gave them either an elemental diet plus plant-based omega 3 (ALA) or fish-oil-based omega 3 (EPA & DHA). **The results showed that the plant-based omega 3 significantly protected the rats from severe Crohn's Disease compared to the fish-oil-based omega 3.**¹⁴

These studies point towards these key distinctions:

1. It is the ratio of omega 6 to 3 that matters most. **Simply sprinkling in a few grams of omega 3 while still consuming dozens of grams of omega 6** (i.e. the "fish oil" research above) will produce minimal effects.
2. Specifically for Crohn's / U.C., it appears that **the plant-based omega 3 (ALA) works better than the fish-based omega 3s (EPA / DHA)**. Also, due to the higher stability of ALA, we are actually able to consume a **higher quantity** of ALA compared to the "fish oils", thus helping to increase our omega 3:6 ratio more!

Now let's take a look at some clinical trials that have been done with flaxseed and flaxseed oil

Flaxseed oil Randomized Clinical Trials (RCTs)

(Both studies were by the same group.)

Study 1

In 2019, 90 patients with U.C. were assigned to take either flaxseed oil (10g a day), ground flaxseed (30g a day), or a control group that only received medical advice and standard medications, for 3 months.¹⁶

After 3 months, the Inflammatory Bowel Disease symptom score (subjective component) improved by 22.76% for the ground flaxseed and by 20.20% for the flaxseed oil group, compared to no change for the control group.

Their Mayo Score (which measures stool frequency, rectal bleeding, endoscopic findings and physician's global assessment; objective score) improved by 31% in the ground flaxseed group and by 26.66% in the flaxseed oil group!

Other markers of inflammation such as ESR, IL-6, INF-gamma, TGF-beta, and Calprotectin all significantly improved in both groups as well!

Study 2

In 2021, 90 patients with UC took 30g of ground flaxseeds, 10g of flaxseed oil, or placebo each day for 12 weeks.¹⁷

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After both the ground flaxseeds and flaxseed oil, but not placebo, markers of inflammation (hsCRP) decreased significantly along with a decrease in overall disease score (larger decreases in disease scores occurred in those with more severe disease). Both flax groups also had a significant increase in the quality of their life!

These are promising initial studies, and agrees with the rodent evidence that we had previously. Furthermore, **these results would likely have been a ton better if the participants had also reduced their omega 6 intake at the same time!**

How to Take Omega 3s

Based on the research, if you are looking to get an omega 3 supplement, **you'd be better off buying flaxseed oil rather than fish oil**. Considering the benefits that have been observed with the lignans³⁹ in flaxseed besides just the oil, it may be **a good idea to buy the one with the lignans included in the oil**. However, always listen to your body. If you find that regular, lignan-free flaxseed oil works best for you, that's completely fine.

1 Tbsp per day of flaxseed oil, or 30 grams of freshly ground flaxseeds, is a perfectly fine amount to take on a daily basis for most people. Store in the refrigerator or freezer so it doesn't spoil, and take during a mealtime. Never heat or cook with the oil.

References

1. Tyagi, Anupama & Putcha, Uday & Reddy, Suryam & Santosh, Vadakattu & Mohammed, Saazida & Ehtesham, Nasreen & Ibrahim, Ahamed. (2012). Attenuation of colonic inflammation by partial replacement of dietary linoleic acid with α -linolenic acid in a rat model of inflammatory bowel disease. *The British journal of nutrition*. 108. 1-11. 10.1017/S0007114511007197.
2. Caligiuri SP, Aukema HM, Ravandi A, Guzman R, Dibrov E, Pierce GN. Flaxseed consumption reduces blood pressure in patients with hypertension by altering circulating oxylipins via an α -linolenic acid-induced inhibition of soluble epoxide hydrolase. *Hypertension*. 2014;64(1):53-59. doi:10.1161/HYPERTENSIONAHA.114.03179
3. Higdon JV, Du SH, Lee YS, Wu T, Wander RC. Supplementation of postmenopausal women with fish oil does not increase overall oxidation of LDL ex vivo compared to dietary oils rich in oleate and linoleate. *J Lipid Res*. 2001 Mar;42(3):407-18. PMID: 11254753.
4. Pingali, Usharani et al. "Evaluation of the Effect of Fish Oil Alone and in Combination with a Proprietary Chromium Complex on Endothelial Dysfunction, Systemic Inflammation and Lipid Profile in Type 2 Diabetes Mellitus - A Randomized, Double-Blind, Placebo-Controlled Clinical Study." *Diabetes, metabolic syndrome and obesity : targets and therapy* vol. 13 31-42. 7 Jan. 2020, doi:10.2147/DMSO.S220046
5. Kenar L, Karayilanoglu T, Aydin A, Serdar M, Kose S, Erbil MK. Protective effects of diets supplemented with omega-3 polyunsaturated fatty acids and calcium against colorectal tumor formation. *Dig Dis Sci*. 2008 Aug;53(8):2177-82. doi: 10.1007/s10620-007-0107-8. Epub 2007 Nov 28. PMID: 18041586.
6. Ishikado A, Morino K, Nishio Y, et al. 4-Hydroxy hexenal derived from docosahexaenoic acid protects endothelial cells via Nrf2 activation. *PLoS One*. 2013;8(7):e69415. Published 2013 Jul 23. doi:10.1371/journal.pone.0069415
7. Anderson EJ, Thayne K, Harris M, Carraway K, Shaikh SR. Aldehyde stress and up-regulation of Nrf2-mediated antioxidant systems accompany functional adaptations in cardiac mitochondria from mice fed n-3 polyunsaturated fatty acids. *Biochem J*. 2012;441(1):359-366. doi:10.1042/BJ20110626
8. Diab J, Al-Mahdi R, Gouveia-Figueira S, et al. A Quantitative Analysis of Colonic Mucosal Oxylipins and Endocannabinoids in Treatment-Naïve and Deep Remission Ulcerative Colitis Patients and the Potential Link With Cytokine Gene Expression. *Inflamm Bowel Dis*. 2019;25(3):490-497. doi:10.1093/ibd/izy349

9. Lev-Tzion R, Griffiths AM, Leder O, Turner D. Omega 3 fatty acids (fish oil) for maintenance of remission in Crohn's disease. *Cochrane Database Syst Rev*. 2014 Feb 28;(2):CD006320. doi: 10.1002/14651858.CD006320.pub4. PMID: 24585498.

10. Lorenz-Meyer H, Bauer P, Nicolay C, Schulz B, Purrmann J, Fleig WE, Scheurlen C, Koop I, Pudel V, Carr L. Omega-3 fatty acids and low carbohydrate diet for maintenance of remission in Crohn's disease. A randomized controlled multicenter trial. Study Group Members (German Crohn's Disease Study Group). *Scand J Gastroenterol*. 1996 Aug;31(8):778-85. doi: 10.3109/00365529609010352. PMID: 8858747.

11. Romano C, Cucchiara S, Barabino A, Annese V, Sferlazzas C. Usefulness of omega-3 fatty acid supplementation in addition to mesalazine in maintaining remission in pediatric Crohn's disease: a double-blind, randomized, placebo-controlled study. *World J Gastroenterol*. 2005;11(45):7118-7121. doi:10.3748/wjg.v11.i45.7118

12. Turner D, Shah PS, Steinhart AH, Zlotkin S, Griffiths AM. Maintenance of remission in inflammatory bowel disease using omega-3 fatty acids (fish oil): a systematic review and meta-analyses. *Inflamm Bowel Dis*. 2011 Jan;17(1):336-45. doi: 10.1002/ibd.21374. PMID: 20564531.

13. Tsujikawa T, Satoh J, Uda K, Ihara T, Okamoto T, Araki Y, Sasaki M, Fujiyama Y, Bamba T. Clinical importance of n-3 fatty acid-rich diet and nutritional education for the maintenance of remission in Crohn's disease. *J Gastroenterol*. 2000;35(2):99-104. doi: 10.1007/s005350050021. PMID: 10680664.

14. Shoda R, Matsueda K, Yamato S, Umeda N. Therapeutic efficacy of N-3 polyunsaturated fatty acid in experimental Crohn's disease. *J Gastroenterol*. 1995 Nov;30 Suppl 8:98-101. PMID: 8563904.

15. <https://www.jeffnobbs.com/posts/why-is-vegetable-oil-unhealthy>

16. Morshedzadeh N, Shahrokh S, Aghdaei HA, et al. Effects of flaxseed and flaxseed oil supplement on serum levels of inflammatory markers, metabolic parameters and severity of disease in patients with ulcerative colitis. *Complement Ther Med*. 2019;46:36-43. doi:10.1016/j.ctim.2019.07.012

17. Morshedzadeh N, Shahrokh S, Chaleshi V, Karimi S, Mirmiran P, Zali MR. The effects of flaxseed supplementation on gene expression and inflammation in ulcerative colitis patients: An open-labelled randomised controlled trial. *Int J Clin Pract*. 2021 May;75(5):e14035. doi: 10.1111/ijcp.14035. Epub 2021 Feb 11. PMID: 33482045.

18. Wang Z, Chen T, Yang C, Bao T, Yang X, He F, Zhang Y, Zhu L, Chen H, Rong S, Yang S. Secoisolariciresinol diglucoside suppresses Dextran sulfate sodium salt-induced colitis

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through inhibiting NLRP1 inflammasome. Int Immunopharmacol. 2020 Jan;78:105931.
doi: 10.1016/j.intimp.2019.105931. Epub 2019 Dec 5. PMID: 31812068.