

Could Fermented Foods Help Your Arthritis?

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✓ Fact Checked

STORY AT-A-GLANCE

- › Eating fermented foods reduced inflammatory protein biomarkers in healthy adults, including interleukin-6, which is linked to rheumatoid arthritis (RA), Type 2 diabetes and chronic stress
- › The process of fermentation raises the level of healthy bioavailable end products, increases the vitamin content and reduces levels of toxic substances so the fermented foods have healthy benefits
- › Your gut microbiome biodiversity has a strong influence on your mental health and depression. There is a bidirectional communication between your gut and central nervous system that some have called your "psychobiome"
- › If you have RA or other chronic inflammatory ailments, reducing or eliminating sugar and eating fermented foods are key to facilitating healing. You may easily make yogurt and natto at home, and experiment with fermenting just about any vegetable to add flavor and health benefits to your diet

Recent research¹ has shown that fermented foods not only can improve gut microbiome diversity, but lower the inflammatory response in your body that affects conditions like rheumatoid arthritis (RA). While I was still in active practice, I was passionate about treating people with RA.

In fact, I **treated over 3,000 people** with this disease, 80% to 85% of whom experienced significant recovery, if not remission. One of the hallmark symptoms of RA is pain in the

proximal joints of the hands or feet.

These are the joints that are closer to the palm of your hand as opposed to joints further out in your fingers. RA is also often symmetrical, which means it affects the same joints in both hands or both feet. The condition is far less common than osteoarthritis.

In joints that are affected by RA, the lining becomes inflamed from an autoimmune and inflammatory response that literally causes your body's own immune system to attack itself.² This can trigger chronic pain, loss of balance and deformities.

Unlike osteoarthritis, which damages the cartilage between the bones in your joints,³ RA can also affect other tissues outside of the joints, such as the eyes, heart and lungs.⁴ Many people with RA experience fatigue, low-grade fever and symptoms that vary from day to day.

In a search of health care claim databases⁵ from 2004 to 2014, researchers found the prevalence of RA in the U.S. population ranged from 0.41 to 0.54%. This varied substantially in each year and by gender and age. However, the data also revealed that the rate appeared to increase during that period, which affected a conservative estimate of up to 1.36 million adults by 2014.

A later study in 2019⁶ indicated there has been a global rise in prevalence and incidence of RA. At the regional level, it appeared to be highest in the high-income areas of North America, the Caribbean and Western Europe.

The lowest rates were found in Western sub-Saharan Africa, southeast Asia and Oceania. The most recent, 2021 study⁷ offers an insight into reducing the inflammatory response and, potentially, the damage caused by RA.

Fermented Foods Lower Levels of Inflammatory Proteins

Researchers from Stanford Medicine published their data in the journal *Cell*,⁸ in which they evaluated 19 inflammatory protein biomarkers from 36 healthy adults who were randomly assigned to eating either fermented or high-fiber foods over a 10-week

intervention period.⁹ Both diets have shown an ability to impact gut microbiome in past scientific study.

In this clinical trial, researchers sought to evaluate how two microbiota-targeted diet interventions could modulate the gut microbiome.¹⁰ They found the gut microbiome and immune system effects on the participants were different.¹¹ The scientists measured stool and blood samples collected during a three-week period before the intervention diet started, during the intervention and during a four-week period after the diet ended.

The data revealed that eating foods like kefir, fermented cottage cheese, vegetable brine drinks, kombucha tea and **kimchi** in other fermented vegetables increase the overall microbial diversity in a dose-dependent manner.¹² The primary outcome of the study was a cytokine response score, which remained unchanged.¹³

However, the data also showed that a high fermented food diet increased microbial community diversity and decreased inflammatory markers,¹⁴ particularly interleukin-6¹⁵ that has been linked to conditions such as rheumatoid arthritis, chronic stress and Type 2 diabetes.¹⁶

In contrast to the reduction of **inflammatory markers** in a group eating fermented foods, those eating a high-fiber diet that consisted of legumes, seeds, whole grains, fruits, nuts and vegetables showed no change in inflammatory markers or microbial diversity. Erica Sonnenburg Ph.D., was on the research team and said in a press release:¹⁷

"We expected high fiber to have a more universally beneficial effect and increase microbiota diversity. The data suggest that increased fiber intake alone over a short time period is insufficient to increase microbiota diversity.

It is possible that a longer intervention would have allowed for the microbiota to adequately adapt to the increase in fiber consumption. Alternatively, the deliberate introduction of fiber-consuming microbes may be required to increase the microbiota's capacity to break down the carbohydrates."

The researchers concluded that fermented foods could be a valuable strategy to counteract a decreasing microbial diversity and increasing inflammatory response that

is ubiquitous in Western Society.¹⁸

Additionally, another of the researchers postulated that other means of targeting the gut microbiome may include probiotics, prebiotics and dietary interventions that could affect bacterial health, and therefore your immune health.¹⁹

Fermentation Creates Healthy Bioavailable End Products

Historically, the primary reason for **fermenting foods** was to preserve it. Over time, many cultures incorporated these foods into their daily diet and were shared with the world. For example, Japanese natto, Korean kimchi and German sauerkraut are popular in many areas outside the respective places of origin.²⁰

The process is controlled by microorganisms and the type of food being fermented. There's a growing consensus that the fermentation process has nutritional benefits by transforming the food and forming bioavailable end products, including an increase in density of vitamins.^{21,22}

When you consumer fermented foods, live cultures give you the **primary benefits**. Unfortunately, fermented foods in the grocery store don't usually contain live cultures. Instead, before packaging, they may be baked, pasteurized, filtered or smoked. During the fermentation process, biologically active peptides are formed. In one paper published in *Nutrients*, the authors wrote:²³

“Fermentation was found to increase antioxidant activity of milks, cereals, fruit and vegetables, meat and fish. Anti-hypertensive peptides are detected in fermented milk and cereals. Changes in vitamin content are mainly observed in fermented milk and fruits.

Fermented milk and fruit juice were found to have probiotic activity. Other effects such as anti-diabetic properties, FODMAP [fermentable oligosaccharides, disaccharides, monosaccharides, and polyols] reduction, and changes in fatty acid profile are peculiar of specific food categories.”

According to authors of a paper published in *Clinical Reviews in Food Science and Nutrition*,²⁴ the bacteria in fermented foods produce peptides have multiple health benefits. The authors say:

“Among these peptides, conjugated linoleic acid (CLA), which have shown the ability to lower blood pressure, exopolysaccharides exhibit prebiotic properties, bacteriocins show anti-microbial effects, sphingolipids have anti-carcinogenic and anti-microbial properties, and bioactive peptides exhibit anti-oxidant, anti-microbial, opioid antagonist, anti-allergenic, and blood pressure lowering effects ...

As a result, fermented foods provide many health benefits such as antioxidant, anti-microbial, anti-fungal, anti-inflammatory, anti-diabetic and anti-atherosclerotic activity.”

Gut Bacteria Affect Mental Health and Depression

Scientific evidence has demonstrated that your [gut microbiome](#) plays a leading role in your mental health. Researchers have found there is a bidirectional communication between your gut microbiome and your central nervous system.²⁵ It's called the gut-brain axis and mounting evidence has demonstrated that dysbiosis is associated with triggering mental health conditions such as anxiety and depression.

Some have coined the term “psychobiome” to describe the crucial connection between your gut bacteria and how you think, feel and act.²⁶ A small start-up lab in Cambridge, Massachusetts, is researching human stool samples with a focus on brain drugs.

As *Science Magazine* reports, the small company hopes to capitalize on the mounting scientific evidence from animal studies and epidemiological studies that your gut microbiome is linked to health conditions such as anxiety, Alzheimer's disease and autism.

As of 2020, the company had developed “one of the world’s largest collections of human gut microbes” over a short five years. When talking to reporters from *Science*, the

company CEO said the initial targets were depression, insomnia and visceral pain conditions that are typical of irritable bowel syndrome.²⁷

Two types of gut bacteria, in particular Coprococcus and Dialister bacteria, have been shown to be “consistently depleted” in individuals diagnosed with clinical depression. According to the authors of a study published in the April 2019 issue of Nature Microbiology:²⁸

“Surveying a large microbiome population cohort (Flemish Gut Flora Project, n = 1,054) with validation in independent data sets, we studied how microbiome features correlate with host quality of life and depression.

Butyrate-producing Faecalibacterium and Coprococcus bacteria were consistently associated with higher quality of life indicators. Together with Dialister, Coprococcus spp. were also depleted in depression, even after correcting for the confounding effects of antidepressants.”

Other studies have also identified microbial profiles associated with better or worse mental health conditions. For example, a 2016 research study²⁹ found the relative abundance of Actinobacteria was higher and Bacteroidetes was lower in depressed individuals compared to healthy controls.

Another study³⁰ in 2015 found patients diagnosed with major depressive disorder had higher amounts of Bacteroidetes, Proteobacteria and Actinobacteria, and lower amounts of Firmicutes than healthy controls.

Kimchi Is a Fermented Food That Can Help You Get Vitamin K2

One of the benefits from the fermenting process is that it can improve the nutritional value of a particular food. For example, kimchi has antioxidant properties associated with lipid-lowering cardiovascular benefits, antimicrobial action, immune system activity and anti-atherogenic activity.³¹

Fermented plants also provide high concentrations of vitamin K2.³² Vitamin K is a fat-soluble vitamin that is an important element for your heart health. In fact, results from the Rotterdam study³³ published in 2004 looked at causes of diseases in the elderly, and determined that those who had consumed the highest amount of vitamin K2 were less likely to experience severe calcification in their arteries and die from heart disease.

K2 is also [important for bone health](#) and osteoporosis prevention. However, vitamin K doesn't store well in your body, so it's depleted quickly if you don't get it regularly from your food. But what kinds of foods are the best ones to get the vitamin K2 you need? One thing the Rotterdam study made clear was there is a difference between vitamin K1 and K2 content in foods.

While K1 was found to be present in high amounts in green leafy vegetables such as spinach, kale, broccoli and cabbage, K2 was only present in high amounts in fermented foods. K2, or menaquinone, is produced by bacteria in your gut and can be found in some animal products, a few plants³⁴ such as spinach, radish leaves and spring onions, and fermented foods, particularly kimchi and cheeses.

Although natto is a soy product that is also high in K2, I [don't promote soy products](#) because most of the soy sold and eaten in the West is genetically modified and grown with highly toxic herbicides.

Tips to Making Fermented Food at Home

If you have RA or other chronic ailments that are rooted in inflammation, your diet is an important first step to facilitate healing. In "[Rheumatoid Arthritis Medication Implicated in Death of Popular Musician – How Natural Treatment Options May Help You Avoid the Same Fate](#)," I outline many of the recommendations that I used for patients who had RA when I was in practice. Among those recommendations is eating fermented foods.

It's becoming more popular to eat fermented foods at home, yet preparing them has largely become a lost art. Probiotic rich foods, like fermented vegetables and homemade yogurt, will boost the population of beneficial bacteria, which then reduces potentially pathogenic colonies.

Since many of the yogurts sold in grocery store shelves are fruit flavored and sweetened with sugar, they don't help promote an overall healthy gut flora. To make yogurt at home you only need a high-quality starter culture and raw, grass-fed milk. You'll find simple step-by-step instructions in "[Benefits of Homemade Yogurt Versus Commercial.](#)"

One of the few soy products that I recommend is natto, if you can obtain the soybeans organically grown. Natto is a fermented soy you can easily make at home. The fermentation process removes the disadvantages of eating raw or cooked soy, so you're left with a dish that's filled with probiotics and nutrients. If you haven't tried natto before, I urge you to give this "[Fresh, Homemade Natto Recipe](#)" a try.

You can also experiment with fermenting just about any vegetable. Some of the more popular are cucumbers (pickles) and cabbage (sauerkraut). Once you have the basic method down it's not difficult. In the video below, Julie and I review how to do this. As I discuss in "[Tips for Fermenting at Home,](#)" there are several steps that you can do to make the whole process a little easier.

Sources and References

- ^{1, 7, 8, 10, 13, 14, 18, 19} [Cell](#), 2021; doi.org/10.1016/j.cell.2021.06.019
- ² [Centers for Disease Control and Prevention, Rheumatoid Arthritis](#)
- ³ [Mayo Clinic Osteoarthritis](#)
- ⁴ [Arthritis Foundation, Rheumatoid Arthritis](#)
- ⁵ [Rheumatology International](#), 2017;37(9)
- ⁶ [Rheumatology Advisor](#), October 17, 2019
- ^{9, 11, 12} [Science Daily](#), July 12, 2021
- ¹⁵ [Science Daily](#), July 12, 2021, Para 3
- ¹⁶ [News Medical Life Sciences, IL-6 and Inflammation](#)
- ¹⁷ [Science Daily](#), July 12, 2021, Para 5, 13
- ²⁰ [Chris Kresser](#), June 25, 2020
- ²¹ [Soul Food Salon](#), April 6, 2018
- ²² [J. Sci. Res.](#) 6 (2), 373-386 (2014)
- ²³ [Nutrients](#), 2019;11(5)
- ²⁴ [Clinical Reviews in Food Science and Nutrition](#) 2019, 59(3):506
- ²⁵ [Clinics and Practice](#), 2017;7(4)
- ^{26, 27} [Science](#), May 7, 2020
- ²⁸ [Nature Microbiology](#) 2019 Apr;4(4):623
- ²⁹ [Molecular Psychology](#) 2016;21(6):786

- ³⁰ Brain, Behavior and Immunity 2015;48:186
- ³¹ Food Industry and Nutrition 2004
- ³² Intech Open March 22, 2017
- ³³ The Journal of Nutrition 2004: 134(11);3100 Last lines of the abstract
- ³⁴ Nutrition Research and Practice December 2013