

Fermented Foods May Be a Key Component of an Anticancer Menu

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✓ Fact Checked

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STORY AT-A-GLANCE

- › Beneficial bacteria found in fermented foods have been shown particularly effective for suppressing colon cancer, but may also inhibit cancers of the breast, liver, small intestine and other organs
- › Microbial metabolism may affect your cancer risk for better or worse by influencing DNA repair, carcinogen metabolism and detoxification, hormone regulation, apoptosis, microbial proliferation and differentiation
- › Microbial metabolism also influences inflammation and immune function, both of which play important roles in cancer. Inflammation and the composition of your microbiome may also influence your risk of type 1 diabetes

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Slowly but surely, scientists are increasingly starting to focus on the influence of nutrition on cancer. Mounting evidence supports the notion that a diet high in healthy fats and low in net carbohydrates (total carbs minus fiber, i.e., nonfiber carbs) may significantly lower your risk by improving mitochondrial and metabolic function.

Fermented foods are also gaining recognition as an important anticancer adjunct. The beneficial bacteria found in fermented foods have been shown particularly effective for

suppressing colon cancer, but may also inhibit cancers of the breast, liver, small intestine and other organs.

For example, butyrate, a short-chain fatty acid created when microbes ferment dietary fiber in your gut, has been shown to induce programmed cell death of colon cancer cells,¹ and cultured milk products may reduce your risk of bladder cancer by about 29 percent.²

Cultured Raw Milk Does Your Body Good

In the case of cultured dairy, lactobacillus and bifidobacterium are primary sources of probiotics in cultured milk products, and these beneficial bacteria have been shown to induce changes reflecting an increase in carbohydrate metabolism.

Both of these bacteria also facilitate excretion of toxins such as Bisphenol A (BPA), and lactobacillus strains in particular may help prevent heavy metal toxicity by binding and excreting these metals.

They've even been shown to reduce the toxicity of heterocyclic aromatic amines (HCA) – cancer causing compounds found in charred meats.³

Kimchi (a Korean fermented cabbage dish) contains probiotics shown to help with the detoxification of organophosphorus pesticides. It also breaks down sodium nitrate, a food preservative associated with increased cancer risk.⁴

Microbial Metabolism Can Influence Your Cancer Risk

Research by Johanna Lampe, Ph.D., at Fred Hutchinson Cancer Research Center suggests microbial metabolism may affect your cancer risk for better or worse in many different ways, by influencing:^{5,6}

DNA repair

Carcinogen metabolism / detoxification

Hormone regulation	Inflammation
Immune function	Apoptosis (programmed cell death)
Microbial proliferation	Microbial differentiation

Moreover, your gut microbiome – which contains 100 times as many genes as your body's total genome – is involved in important chemical reactions that your gut enzymes cannot perform, including fermentation and sulfate reduction.

Importantly, your gut microbiome helps generate new compounds (bacterial metabolites) that can have either a beneficial or detrimental impact on your health.

On the upside, some of these compounds act as sources of energy and/or help regulate your metabolism and reduce inflammation. Others can cause oxidative stress.⁷ Food components known to produce beneficial bacterial metabolites include dietary fiber, plant lignans, anthocyanins and linoleic acid, just to name a few.

As noted by Lampe, "availability of nutrients or bioactive substances important for health can be influenced by gut microbiota," and "understanding the impact of the bacterial metabolites on regulatory pathways may help guide future diet and cancer prevention strategies."⁸

Chronic Inflammation Raises Your Risk for Cancer

Reducing inflammation is one important anticancer feature of fermented foods. As explained by Stephanie Maxson, senior clinical dietitian at MD Anderson's Integrative Medicine Center, "Prolonged inflammation can damage your body's healthy cells and tissue, and weaken your immune system."

And, since your immune system is the first line of defense, a weakened immune system is what allows for diseases such as cancer to get a foothold in the first place; hence, reducing inflammation is a foundational aspect of cancer prevention.

One group of microbes that appear important for maintaining healthy immune function is the clostridial group of microbes. Ironically enough, this group is related to *Clostridium difficile*, which can cause severe and life-threatening intestinal infections.

But whereas *C. difficile* prompts chronic inflammation, the clostridial clusters actually help maintain a healthy and well-functioning gut barrier, preventing inflammatory agents from entering your bloodstream.⁹ Factors that promote chronic inflammation in your body include but are not limited to:

- Obesity
- Smoking
- Stress
- Lack of exercise
- Poor dietary choices

Inflammation and Microbiome Play a Role in Type 1 Diabetes

The connection between your microbiome and inflammation has also become evident in Type 1 diabetes (insulin-dependent diabetes) which, contrary to type 2 diabetes, is an autoimmune disorder.

The root cause of type 1 diabetes has been a medical mystery, but more recent research suggests the disease may be rooted in gut dysfunction. As reported by Medical News Today:¹⁰

"[I]ndividuals with type 1 diabetes show increased intestinal permeability and changes in the microvilli, which are microscopic, finger-like projections from the gut lining. Although the reasons behind these modifications are unclear, errant gut bacteria are currently the prime suspects."

To investigate the impact gut bacteria may have on the development of type 1 diabetes, Italian researchers examined the gut flora and inflammation levels in 54 type 1

diabetics.

All had endoscopies and biopsies taken from their duodenum, the early section of the intestinal tract, and all were on a similar diet at the time of the procedures. The results revealed they had significantly more inflammation than healthy controls and even patients diagnosed with celiac disease.

Their gut flora was also significantly different, with fewer proteobacteria (a group of organisms that includes escherichia, which help produce vitamin K, and salmonella, which is associated with food poisoning) and higher levels of firmicutes (a group of bacteria that include bacilli and streptococcus). According to the featured article:¹¹

"The next step will be to understand whether the changes in the gut are caused by type 1 diabetes or vice versa. Either way, the study marks a step forward in our understanding of this condition.

As Piemonti notes: 'We don't know if type 1 diabetes' signature effect on the gut is caused by or the result of the body's own attacks on the pancreas. By exploring this, we may be able to find new ways to treat the disease by targeting the unique gastrointestinal characteristics of individuals with type 1 diabetes.'"

Key Features of an Anti-Inflammatory, Anticancer Diet

Many cancer experts, including MD Anderson's Integrative Medicine Center and the American Institute for Cancer Research (AICR) now promote anti-inflammatory diets, placing focus on:¹²

- **Organic plant foods and traditionally fermented and cultured foods** – AICR recommends making sure at least two-thirds of your plate are plant foods, and to eat at least one small serving of fermented food each day.
- **Limiting processed foods** and eating a diet of whole, fresh foods cooked from scratch instead.
- **Avoiding sodas, sport drinks and other sugary beverages**, including fruit juices.

- **Balancing your omega-3 and omega-6 ratios** — For most, this means increasing your intake of animal-based omega-3 from fatty fish low in mercury and other contaminants, such as wild-caught Alaskan salmon, anchovies and sardines, and reducing consumption of omega-6 fats, abundant in refined vegetable oils (fried foods and processed foods).
- **Limiting red meat and avoiding processed meats** (such as deli meats, bacon, sausage, hot dogs and pepperoni). To lower your protein consumption — which can be an important factor in everything from premature aging to cancer — consider replacing some of the red meat you eat with fish instead, which is lower in protein.

Gut Bacteria Mediate Risk for Certain Types of Colon Cancer

Eating a plant-based, fiber-rich diet is key for preventing colon cancer in particular, and the reason for this is directly related to the way fiber affects your gut microbiome. As recently reported by Medical News Today:¹³

"Studies have shown that a diet high in red and processed meats may increase the risk of colorectal cancer, while a high-fiber diet — rich in fruits, vegetables and whole grains — has been associated with a lower risk of the disease.

Previous research has suggested that one way by which diet influences the risk of colorectal cancer is through the changes it makes to the gut microbiome (the population of microorganisms that live in the intestine).

*The new study from Dr. [Shuji] Ogino and team supports this association, after finding that individuals who followed a high-fiber diet were at a lower risk of developing colorectal cancer tumors containing the bacterium *F. nucleatum*."*

F. nucleatum has been shown to be prevalent in the stool of people who eat a Western-style, low-fiber diet, and these people also have a higher risk of colon cancer. "We theorized that the link between a prudent diet and reduced colorectal cancer risk would be more evident for tumors enriched with *F. nucleatum* than for those without it," Ogino says.

To test this theory, the team analyzed health and nutritional data from more than 137,200 participants in the Nurses' Health Study and the Health Professionals Follow-Up Study. They then analyzed tumor samples obtained from participants who developed colorectal cancer during the study, to ascertain whether *F. nucleatum* was present.

Food frequency questionnaires, which participants filled out at two- to four-year intervals, were used to calculate nutrient and fiber intake. Participants who ate a "prudent" diet, defined as being high in vegetables, fruits, whole grains and legumes, had a significantly reduced risk of colorectal cancer-containing *F. nucleatum*, compared to those who ate a Western-style, low-fiber diet.

That said, the prudent diet did not affect the risk of developing colorectal cancer that was free of *F. nucleatum*. According to Ogino, these findings "point to a much broader phenomenon – that intestinal bacteria can act in concert with diet to reduce or increase the risk of certain types of colorectal cancer."¹⁴

Which Foods Have the Greatest Impact on Your Microbiome?

In a recent episode of the BBC "Trust Me, I'm a Doctor" program, 30 volunteers agreed to eat a certain type of fermented food for one month, to see how it would affect their gut microbiome. The volunteers were split into three groups, receiving either a commercial probiotic drink, traditionally fermented kefir or inulin-rich foods such as Jerusalem artichokes, chicory root, onions, garlic and leek. (Inulin is a prebiotic fiber.) As reported by the BBC:¹⁵

"What we found at the end of our study was fascinating. The group consuming the probiotic drink saw a small change in one bacteria type known to be good for weight management, bacteria called lachnospiraceae.

However, this change wasn't statistically significant. But our other two groups did see significant changes. The group eating foods rich in prebiotic fiber saw a rise in a type of bacteria known to be good for general gut health – something that is in line with other studies.

Our biggest change, however, was in the kefir group. These volunteers saw a rise in a family of bacteria called lactobacillales. We know that some of these bacteria are good for our overall gut health and that they can help conditions such as traveler's diarrhea and lactose intolerance."

Store-Bought Versus Homemade

Next, the BBC team sent out a variety of homemade and store-bought fermented foods and beverages for laboratory testing, which revealed "striking differences" in microbial composition. Not surprisingly, the store-bought versions contained very minute levels of beneficial bacteria, while the homemade versions were rich in a wide array of probiotics.

One of the primary reasons for this difference has to do with the fact that commercial products are pasteurized to prolong shelf-life and ensure safety, and pasteurization kills the very bacteria the products are supposed to supply.

This is precisely why I strongly recommend making sure you're buying traditionally fermented, unpasteurized products or, better yet, make them yourself. It's far easier than you might think, and can save you a lot of money to boot.

Nourish Your Microbiome to Optimize Your Health

Mounting research suggests that your microbiome – colonies of bacteria, viruses and other microbes living in your gut – may be one of the preeminent factors determining your health and longevity.

Hence, feeding beneficial gut bacteria with a healthy, fiber-rich diet and fermented foods, and boycotting processed foods and animal foods raised in confined animal feeding operations (CAFOs) – both of which tend to have an adverse effect on your microbiome – may be keystone strategies for optimal health and disease prevention, including cancer.

Sources and References

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