

Understanding GI microbiome and probiotics

The field of research into microbiome and probiotics as they relate to health and disease is changing fast, and hopefully this short review can help get you up to speed. The gut microbiome is broadly defined as the entire collection of microbes found in the G.I. tract, and consists mostly of bacteria and yeast organisms. In humans, the peak concentration of microbiome organisms occurs in the colon, reaching a staggering 100 billion bacteria and yeast organisms per gram of stool content.

Certain disease states, such as *C. diff* infection of the colon, Crohn's colitis and ulcerative colitis are highly correlated with microbiome that lack the proper diversity and density of beneficial organisms. Recent studies also suggest with a high probability that unhealthy gut microbiome patterns play some role in the development of other diseases as well, including diabetes, obesity, food allergies, asthma, atopic dermatitis and even premature aging and brain diseases such as Alzheimer's.

On the opposite end of the spectrum, the healthiest microbiome studied so far are found in a group of hunter-gatherer people in Tanzania called Hadza. A 2014 study analyzed stool samples from the Hadza people and found that they had much higher concentrations of healthy gut bacteria compared to Westerners. The Hadza people eat foods exclusively foraged and hunted from forests, including wild berries, root plants, honey and wild meat. They do not eat foods raised on farms or any processed foods. Their diet is rich in prebiotics (a fancy term for nondigestible carbohydrates/fiber that stimulate the growth and activity of beneficial colonic bacteria). Not surprisingly, their rates of disease states such as diabetes, obesity, autoimmune diseases, colon cancer and Crohn's disease are much lower than in Western populations. Conversely, a Western diet with processed foods, refined sugars, low-fiber content foods, artificial sweeteners, preservatives and artificial colors tends to lead to a microbiome with much lower diversity and density of beneficial bacteria and yeast in the GI tract.

On a practical level, let's discuss what can be done right now to improve your gut microbiome. Simply put, a plant-based diet, with a variety of fiber-rich foods is healthier for the gut microbiome. Foods prepped from scratch also result in healthier gut microbiome compared to packaged or processed foods. And as difficult as it may be for some, eliminating all artificial sweeteners, even including stevia may help to promote a healthier microbiome.

For those who want quick solutions using over-the-counter probiotic supplements to improve one's microbiome, the news is not so good. It turns out that the best microbiome is developed naturally through good eating patterns and not necessarily through supplements. In 2020, the American Gastroenterological

Association published guidelines that state the available scientific evidence was too weak to recommend the use of probiotics routinely for GI health. The recommendations went even further to say that currently available probiotic supplements are not beneficial for *C. diff* infection of the colon, Crohn's disease, or ulcerative colitis. There was only weak evidence to suggest that taking a probiotic around the time of antibiotic use can be beneficial. The best studied bacteria and yeast products for this purpose found are *L. rhamnosus* (found in the brand, Culturelle) and *S. boulardii* (found in the brand, Florastor).

Recent publications have mentioned some interesting possible applications of microbiome manipulation. For example, a study published in the journal *Nature* in 2019 found that elite athletes have a unique set of microbiome that may enhance their performance by helping convert a waste product generated during anaerobic exercise called lactate into a more benign chemical called propionate. In theory, changing one's microbiome to this pattern may result in better energy utilization and sports performance. This has even led some to try to find ways to get stool microbiome transplants from elite athletes to try to boost their own athletic performance. (Definitely a risk and unproven practice for now, and one that is now known as stool doping.)

A June 2022 article in the journal *Trends in Molecular Medicine* summarizes preliminary research in the area of stool banking for later fecal microbiota transplantation. This is a practice of banking your own stool in a frozen state (through specialized centers) when you are younger and healthier, and then using the stored stool samples years or even decades later, when your health may have declined to re-populate your colon, in an attempt to rejuvenate the gut microbiome. The hope is that a rejuvenated set of gut microbiome, replicated from a set from when you were healthier may delay or even improve disease states involving the gut, immune system, heart, brain, aging and even perhaps mental wellness.

As always, before embarking on any significant change of your diet, medications or supplements, please consult your personal physician.

Administrative Update:

Our Austin, Texas office has opened!

Dr. Marroquin is board-certified in Internal Medicine and has practiced in Austin since 2009. You can learn more about Dr. Marroquin at www.ctxphp.com. Address: 1305 West 34th St., Suite 204. Austin, Texas 78705. Phone: 737-285-3770.

Please join us in welcoming James Marroquin, MD and our care team in Austin.

Preferred Health Partners Locations

Dallas Office 3417 Gaston Ave., Suite 700 Dallas, Texas 75246 214-823-4800	Plano Office 4708 Dexter Dr., Suite 400 Plano, Texas 75093 972-993-5050	Park Cities Office 8215 Westchester Dr, Ste 320 Dallas, Texas 75225 972-993-5040	Las Colinas Office 440 West I-635 Suite 405 Irving, Texas 75063 972-993-5080	Frisco Office 3535 Victory Group Way, Ste 330 Frisco, Texas 75034 972-993-5070	Austin Office 1305 West 34th St., Suite 204 Austin, Texas 78705 737-285-3770
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HEALTHY HABITS

Fall Kale and Chicken Sausage Salad

From: The Savvy Spoon

Servings: 2

Ingredients:

Salad

- 1 cup shredded kale ribs removed (could swap for spinach or arugula)
- 1 cup shredded Brussels sprouts
- 3 links chicken apple sausage cut into discs (could swap for grilled or rotisserie chicken)
- 1/2 cup cooked quinoa (could be swapped for any whole grain ex: bulgur)
- 1/2 large Honeycrisp apple diced
- 1/4 cup roasted and salted pecan halves crushed
- 1/4 cup shredded aged white cheddar cheese I like Unexpected Cheddar from TJ's

Honey Dijon Vinaigrette

- 3 tbsp. Dijon mustard
- 1 tbsp. apple cider vinegar
- 1 tbsp. honey
- 1 clove garlic minced
- 1 tsp. kosher salt
- 1/2 tsp. black pepper
- 1/3 cup avocado oil

Directions:

1. Cook chicken sausage disks in a skillet over medium-high heat. Cook for 2-3 minutes per side then remove from the heat.
2. Make the dressing. Whisk together all ingredients for dressing. Taste for seasonings and adjust if needed.
3. In a large salad bowl, add shredded kale and Brussels sprouts. Pour in 1/2 of the dressing and massage greens to soften the leaves.
4. Add cooked quinoa, diced apples, roasted pecans and aged cheddar.
5. Then add chicken sausage discs and pour in remaining dressing and toss salad.
6. Serve warm or at room temperature and enjoy!

<https://thesavvyspoon.com/2022/09/14/fall-ish-kale-salad-with-chicken-sausage-recipe/>

This is a great recipe for a quick fall weeknight dinner or fun way to mix up your weekly lunch routine. The salad will last ~2 days in the fridge with the dressing.