Good Gut Health

K-STATE Research and Extension
Family and Consumer Sciences

FACT SHEET

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The health of your gut plays a fundamental role in your overall well-being and is often overlooked as a contributor to illness and disease. Your gut health can influence everything from immune function to psychiatric disorders, autoimmune diseases, obesity, chronic diseases, and more. You may wonder, how is the gut so powerful in influencing health? Your gut microbiome is home to trillions of microorganisms that work together to maintain homeostasis (perfect balance) in your gastrointestinal tract (GI). Disrupting this balance, often called dysbiosis, can lead to various issues and conditions. Additionally, your gut and brain have a direct line for back-and-forth communication, known as the gut-brain axis, thus impacting your mental and physical health. In this lesson, the authors will explore the importance of maintaining a healthy gut, factors that can affect gut health, and how to improve your gut health through diet and other health behaviors.

The Gut Microbiome

First, you must understand your gut microbiota better to understand gut health. You have trillions of microbes living on and in your body at any time, equal to about the same number of your human cells. These microbes usually live in harmony with you and often provide beneficial support, but sometimes they may be harmful. The highest concentration of microbes is found in your gut. Our GI tract has a surface area as big as a tennis court.

The gut microbiota has several critical functions. It helps support a healthy immune system, metabolizes undigested dietary fiber, produces essential nutrients (such as short-chain fatty acids, vitamins, and amino acids), and communicates and controls your nervous system via the gut-brain axis.

Gut health begins at a young age

The gut microbiota is acquired in utero with the amniotic fluid, and additional microbes are acquired at birth. The microbiota then rapidly develops during early childhood, being fully established by the first 1,000 days of life. The microbiota diversity remains relatively stable during adulthood and may decline during older adulthood. Numerous factors can impact your gut microbiota throughout your life, some of which you can control and others you cannot. These factors include, but are not limited to:

- Delivery method at birth (vaginal vs cesarean)
- Breast or formula-fed during infancy
- Diet
- Stress
- Medications (particularly antibiotic use)
- Genetics
- Disease and illness
- Environments
- Age

After your gut microbiota is established, it will remain relatively the same until older adulthood if there are no significant changes to your health, dietary behaviors, stress, or other influencing factors. It is important to focus on the factors you can control, specifically your diet and lifestyle factors, to support a healthy gut microbiota during all stages of life.

Fiber and gut health go together

When you think about improving your gut health, fiber should be your first consideration. Dietary fiber is found in the plants you eat. Traditional Western diets have been associated with higher rates of chronic disease and increased risk of mental health illness compared to a Mediterranean diet. The traditional Western diet includes more processed foods and simple carbohydrates. In contrast, the Mediterranean diet includes higher intakes of fruits, vegetables, legumes, nuts and seeds, and whole grains, all of which have fiber, antioxidants, and other important nutrients. The traditional Western diet is much lower in fiber than the Mediterranean diet. It is no surprise that the average U.S. adult's fiber consumption is well below the recommended intake, with an average intake of about 10 to 15 grams of fiber per day.

Do you know how much fiber you consume daily?

90% of women and 97% of men do not meet recommended dietary fiber intake.

Why is fiber so important? Dietary fiber has been shown to reduce obesity, cardiovascular disease, and cancer and regulate blood sugar. Fiber is also an indigestible carbohydrate necessary for the gut microbiota to survive and thrive.

Table 1: Daily Dietary Recommendations

AGE	MALE	FEMALE
2-3 years	14 grams	14 grams
4-8 years	17 grams	20 grams
9-13 years	25 grams	22 grams
14-18 years	31 grams	25 grams
19-30 years	34 grams	28 grams
31-50 years	31 grams	25 grams
51+ years	28 grams	22 grams
Dietary recommendations are 14 grams per 1000 calories consumed.		

Source: Dietary Guidelines for Americans 2020-2025

Table 2: High-Fiber Foods

FRUITS	GRAMS OF FIBER
Rasberries (1 cup)	8.0
Blackberries (1 cup)	7.6
Pear (1 medium)	5.5
Apple (1 medium)	4.5
Blueberries (1 cup)	3.6
VEGETABLES	**GRAMS OF FIBER**
Avocado (1 cup cubes)	10
Broccoli, cooked (1 cup chopped)	5.1
Turnip greens, cooked (1 cup chopped)	5.0
Kale, cooked (1 cup chopped)	4.0
Brussel sprouts, cooked (1 cup chopped)	4.1
GRAINS	**GRAMS OF FIBER**
Popcorn (3 cups air-popped)	3.5
Bulgar, cooked (1 cup)	8.2
Pearled barley, cooked (1 cup)	6.0
Quinoa, cooked (1 cup)	5.2
Oatmeal, cooked (1 cup)	4.0
LEGUMES	**GRAMS OF FIBER**
Navy beans, cooked (1 cup)	19.1
Pinto beans, cooked (1 cup)	15.4
Black beans, cooked (1 cup)	15.0
Lentils, cooked (1 cup)	15.6
Chickpeas, cooked (1 cup)	12.5
NUTS AND SEEDS	**GRAMS OF FIBER**
Chia seeds (1 oz)	9.8
Flax seed (1 oz)	6.6
Almonds (1 oz)	3.5
Pistachios (1 oz)	3.0
Sunflower (1 oz)	2.4

Source: USDA FoodData Central

Probiotics

Probiotics are living microorganisms found in fermented foods and beverages. Fermented foods have been around for thousands of years, but in recent years, have gained popularity due to the potential health benefits of probiotics. These days, probiotics can be found in various foods, drinks, and dietary supplements. The popularity of probiotic-rich fermented foods is partly due to research that has shown that probiotics may support a healthy immune function, support a healthy balance of gut microorganisms, and be used for the prevention or treatment of certain illnesses and diseases.

Probiotics as supplements

It is important to note that probiotics sold as dietary supplements do not require approval by the Food and Drug Administration before they are sold, and no regulations guarantee that the microorganisms will still be alive by the time you purchase them. Therefore, as a consumer, it is vital to research and talk with your healthcare provider about probiotics as a dietary supplement before consuming. Your healthcare provider may prescribe probiotics to help maintain a healthy balance of gut microbiota if you are consuming an antibiotic. Antibiotics are prescribed to kill harmful bacteria that are making us ill, but they also kill good bacteria.

Fermentation produces probiotics

The good news is that several fermented food sources provide probiotics to support good gut health. Fermentation can happen naturally when the microorganisms are already present in the environment or can be introduced into food by adding a starter culture. Foods that contain probiotics are:

- Sauerkraut
- Sourdough
- Yogurt
- Kimchi
- Kefir
- Kombucha
- Tempeh
- Miso
- Natto

Research is ongoing to determine the strains of microorganisms that have the most significant impact on health and the effect of processing after fermentation, in the case of baking sourdough bread. Microorganisms that are not alive, such as those destroyed during processing, do not provide the same benefits as living microorganisms and are not considered probiotics.

Prebiotics

Food for gut health

You can think of prebiotics as food for a healthy gut microbiome. It is important to note that not all dietary fibers are prebiotics, but all prebiotics are dietary fibers and may be counted towards dietary intake. Prebiotics promote the growth of healthy gut bacteria and are crucial to consume in your diet every day. Foods that contain prebiotics are:

- Fruits, including bananas, apples, and blueberries
- Vegetables, including asparagus, jicama, leeks, leafy greens, and artichokes
- Nuts
- Seeds
- Legumes
- Beans
- Whole grains, including bran
- Breast milk

Other forms of prebiotics include psyllium, resistant starch, fructooligosaccharides (FOS), and inulin.

Be cautious of manufactured prebiotic foods

You may notice that food manufacturing companies may also promote foods and drinks to be high in fiber or contain prebiotics. Typical products include breakfast bars, cereals, snacks, and soda alternatives. While these foods provide dietary fiber, checking the nutrition facts label for added sugar, sodium, and saturated fat is still important. Processed products are often the culprit for excess added sugar, sodium, and saturated fat in the diet. Prebiotics are generally tolerated well by the GI tract. Still, excess consumption of prebiotics may lead to gas, bloating, abdominal cramping, and diarrhea, so consume processed products with added prebiotics in moderation.

Other Keys to Good Gut Health

Eat less sugar and artificial sweeteners. Regularly consuming sugar and artificial sweeteners can harm gut health by promoting inflammation and disrupting the balance of beneficial gut bacteria. In particular, sugar serves as a food source for harmful microorganisms that can outgrow beneficial bacteria and dominate the gut. Consume natural fiber-rich fruits to curb those sweet cravings and avoid artificially or sugar-sweetened beverages.

Exercise regularly. Exercise does more than strengthen muscles and bones — it can also positively influence gut health. Moving your body daily can help enhance the diversity of gut microbiota, promote regular bowel movements, and aid in better digestion and nutrient absorption. It is important to reach at least 150

minutes of moderate physical activity each week and strength training twice weekly. Regular exercise also supports a healthy weight and reduces the risk of chronic diseases.

Don't smoke. Cigarette smoking is the leading cause of preventable disease and death, but you may not have known that it also disrupts your gut microbiota. The toxic chemical compounds in cigarettes can increase harmful bacteria while decreasing beneficial bacteria. Smoking may also worsen symptoms from irritable bowel syndrome, Crohn's disease, and ulcerative colitis.

Reduce stress. Remember that your brain and gut are connected. Acute and chronic stress may be detrimental to your physical and emotional health. When stressed, you may experience changes in digestion, resulting in pain, constipation, or diarrhea. Chronic stress and inflammation may also weaken the intestinal lining, leading to a "leaky gut," disrupting the balance of microorganisms in the gut. Managing stress through relaxation techniques such as meditation, deep breathing exercises, yoga, or mindfulness can help your mental health and protect your gut health.

Get enough sleep. Sleep is imperative for overall health. It is a time when the body rests and recovers and repairs itself. Getting adequate sleep can help your immune system stay strong, reduce stress, and lower the risk of chronic disease. A healthy, balanced gut microbiome has also been associated with good sleep. Adults should aim for 7 to 9 hours of quality sleep every night. Establish a consistent bedtime routine, turn off electronics 30 minutes before sleep, limit alcohol and caffeine, and have a comfortable environment to get a good night's sleep.

Conclusion

The gut microbiome plays a crucial role in digestion, immunity, chronic disease, and mental health. Fiber is essential for gut health, yet most people do not consume enough. Probiotics are live microorganisms in fermented foods and beverages that support gut and overall health. Prebiotics are found in fiber-rich foods like fruits, vegetables, and whole grains, and they feed beneficial gut bacteria. A balanced diet and healthy habits can promote a thriving gut microbiome and overall well-being.

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