Keywords: gut microbiome and human health

Problem: Gut microbiome and human health are closely linked. Some widely accepted practices may negatively impact the diversity of intestinal microbes. People assume diet drinks are better than their sugary counterparts. However, the WHO advises people to avoid non-nutritive sweeteners (NNS).

Solution: This article provides the following:

- 1. An explanation of how the gut microbiome can help or harm human health
- 2. Considerations about NNS consumption
- 3. Practical tips on improving gut bacteria diversity

Gut Microbiome & Human Health: Facts, Tips and Considerations

Like the ocean depths, the intestinal tract is a mysterious ecosystem waiting to be explored. Gastrointestinal microbes impact biological processes, yet the mechanisms are still an enigma. However, scientists are confident that gut microbiome and human health are closely linked.

Improving microbiome diversity enhances immunity, reduces inflammation, impacts metabolism and prevents many illnesses. Keep reading to learn interesting facts, tips and considerations related to gut microbiome and human health.

Key Takeaways

- Gut microbiota is vital for extracting nutrients, bolstering immunity, improving metabolism, sending messages and responding to glucose.
- Many non-modifiable factors contribute to microbiome diversity. However, changes in diet can help improve and rebuild the gut microbiome.
- Incorporating foods rich in probiotics and prebiotics balances the gut's environment. Beneficial bacteria displace pathogenic bacteria, promoting a balanced and healthy microbial ecosystem.
- Many turn to non-nutritive sweeteners to lose weight. Yet the WHO advises people to avoid these additives for weight loss.
- Gut microbiome and human health are intricately linked. However, more research is needed to understand all the connection mechanisms.

Gut microbiome and human health

Microbiome is the term used to describe the intestinal ecosystem. It includes microorganisms, metabolites, microbial structures and environmental conditions. Like all healthy ecosystems, the microbiome depends on diverse species symbiotically coexisting.

Microbes are in the gut, oral cavity, skin, respiratory system and genitals. Scientists refer to the intestinal species as microbiota. These living organisms are bacteria, yeast and viruses. These vital microbes impact the body in the following ways:

- Nutrient extraction
- Immunity
- Metabolism
- Brain-gut messaging
- Insulin resistance and secretion

The biosynthesis of vitamins, amino acids and lipids depends on microbiota diversity. Each species plays a unique role in transforming energy into molecules. The more species present in the gut, the more biosynthesis occurs.

Microbial diversity, gene richness and a stable core microbiota characterize a healthy microbiome. People who consume a variety of foods generally have a more expansive microbiome. These individuals tend to be healthier and more adaptable. Conversely, people who eat the same foods day after day often have a uniform microbiome. This limited diet is common in patients with cardiovascular disease (CVD) and obesity.

Gut microbiome and human health are intricately connected. Gut microbiota colonizes mucosal surfaces and produces antimicrobial substances, protecting against pathogens. Therefore, disrupting the microbiota has damaging impacts.

How to promote a diverse gut microbiome

Over the past 50 years, American diets have drastically shifted. Convenience has become the priority. Most Americans consume excessive meat and bread while eating inadequate fruits and vegetables. Consequently, dietary diversity has declined, impacting health worldwide. Insufficient fruit and vegetable intake and increased antibiotic use result in microbiota homogeneity. So, how does someone improve biodiversity in the gut?

Many factors contribute to the microbiome's composition. The following are non-modifiable contributors:

- Mother's vaginal and intestinal microbiota
- Mode of delivery: vaginal or Cesarean
- Method of feeding: breast milk or formula
- Exposure to the environment
- Genetic factors
- Age

• Gender

A healthy gut microbiome is not entirely dependent on non-modifiable factors. According to the National Institutes of Health (NIH), individuals can rebuild their gut microbiome. **By consuming probiotics and prebiotics, people can diversify their microbiota.**

Probiotics are living microorganisms that support the intestinal ecosystem. These "good" bacteria displace pathogenic bacteria, promoting a positive microbial community. Some fermented foods that are rich in probiotics include:

- Yogurt
- Sauerkraut
- Kombucha
- Kefir
- Kimchi
- Tempeh

Prebiotics are the probiotics' food source. These plant-based, high-fiber foods deliver nutrients to bacteria in the colon. Prebiotics travel to the depths of the intestines. The microbiota digests them, producing short-chain fatty acids. These foods are typically rich in fermentable soluble fiber. Some common prebiotic food sources include:

- Boiled potatoes
- Oats
- Rice
- Beans
- Onions
- Garlic
- Apples
- Carrots
- Peaches

A diet rich in whole and fermented foods supports a diverse gut microbiome. The goal is to replace harmful microorganisms with beneficial species. Research shows that expanding microbiota species improves metabolism, immunity and wellness. However, the microbiota needs time to wake up. Patients should gradually introduce probiotic and prebiotic foods to avoid uncomfortable bloating.

Do non-nutritive sweeteners impact gut health?

Scientists suspect that they do, but the pathways of impact remain unclear. Using non-nutritive sweeteners (NNS) to lose weight is a prevalent strategy. However, the NIH claims that NNS may increase weight gain and adiposity. Additionally, the World Health Organization (WHO) advises people trying to lose weight to avoid these possibly damaging additives. But why is the NIH and WHO concerned about NNS use?

NNS promotes microflora growth similar to that of people with obese phenotypes. *This process may negatively impact the gut microbiome, altering metabolism and insulin secretion.* A higher concentration of short-chain fatty acids (SCFAs) is associated with obesity. Scientists suspect that elevated SCFAs exposed to NNS indirectly impact metabolism. NNS triggers sweet taste receptors and insulin secretion. Therefore, NNS could cause more harm than good. More research is needed to understand the impact of NNS on the gut microbiome.

Supporting health with accessible care

The intricate relationship between the gut microbiome and human health remains a mystery. Much more study is still needed. Yet, we know enough to make some healthy habit changes. A diet rich in fruits, vegetables and fermented foods promotes microbiome diversity and human health. Making simple changes produces significant results.

Family physicians carry a heavy load. They must be knowledgeable about various medical topics, like gut health. Our hospital is here to support you. **We are passionate about making excellent care accessible.** We would be honored to help lighten that load and be your partner in care. Click the "Refer" button to connect today.

Resources

"What Are Prebiotics and What Do They Do?" Cleveland Clinic, 2022, What Are Prebiotics and What Do They Do?

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