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Decreased dietary diversity linked to reduced microbiotic richness

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Changes in farming practices over the last 50 years have resulted in decreased agro-diversity which, in turn, has resulted in decreased dietary diversity. The significant impact of this change in dietary richness on human health is the topic of an insightful perspective in Molecular Metabolism by Mark Heiman, MicroBiome Therapeutics and Frank Greenway, Pennington Biomedical Research Center.

Heiman and Greenway describe how the reduction in dietary diversity has changed the richness of human gut microbiota, the community of microorganisms living in the gut. The researchers point out that healthy individuals have diverse gut microbiota and many of the common pathologies of the 21st century, including type 2 diabetes, obesity and inflammatory bowel disease, are associated with reduced microbiotic richness.

Gut microbiota function as an endocrine organ, metabolizing specific nutrients from the diet and producing specific substances that act as metabolic signals in the host. It follows then that highly specialized diets will change the landscape of the gut microbiome over time. In fact, it takes only a few days of changing diet to alter the micro biotic makeup of the human gut.. And if the dietary change involves elimination of one or more macronutrients (think Atkins or Paleo or vegan), humans are essentially selecting for some micro biotic species over others.

The importance of microbiota diversity cannot be overstated. They produce an abundance of important molecules for the host and with increased variation comes increased adaptability and an increased range of physiological responses. "The greater the repertoire of signals, the more likely is the ability to maintain homeostasis when dietary intake is perturbed," explain Heiman and Greenway. "Furthermore, because each particular macronutrient has the potential to be metabolized by microbiota into unique metabolic signals, the greater the variety in signals, the greater the variety of responses possible."

The authors suggest that additional research into how specific macronutrients impact the microbiome and how to increase gut microbial diversity may be the future of personalized medicine in metabolic disease. A stool sample, rather than a blood sample, may be enough for the doctor to prescribe individualized dietary changes that will treat metabolic disorders.

Source:
Elsevier
