

Walnuts impact gut microbiome and improve health

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Credit: Lawrencekhoo / Wikipedia.

Diets rich in nuts, such as walnuts, have been shown to play a role in heart health and in reducing colorectal cancer. According to a new study from the University of Illinois, the way walnuts impact the gut microbiome—the collection of trillions of microbes or bacteria in the gastrointestinal tract—may be behind some of those health benefits.

Walnuts are just one in a line of foods that contain dietary fiber and have interested scientists for their impact on the microbiome and health. Dietary fiber acts as a food source for gut microbiota, helping the bacteria to do their jobs—breaking down complex foods, providing us nutrients, or helping us feel full, for example.

Fruits, vegetables, whole grains, nuts, and legumes are important plant sources of dietary fiber. Eating a variety of these foods helps promote a diverse gut microbiota, which in turn helps to support health.

Findings from the study, published in *The Journal of Nutrition*, show that consuming walnuts not only impacted the gut microbiota and microbial derived secondary bile acids, but also reduced LDL-cholesterol levels in the adults participating in the study; good news for cardio, metabolic, and gastrointestinal health.

"We found that when you consume walnuts it increases [microbes](#) that produce butyrate, a beneficial metabolite for colonic health. So the interaction of walnuts with the microbiome is helping to produce some of those health effects," says Hannah Holscher, assistant professor of food science and human nutrition at U of I, and lead author of the study. "It is about getting to the 'black box' that is all the microbes in our GI tract to see how they are interfacing with the food we eat and having downstream health effects.

"Some of those health effects are hypothesized to be related to the metabolites bacteria produce," she adds.

For the controlled-feeding study, 18 healthy male and female adults consumed diets that either included 0 grams of walnuts or 42 grams—about a third cup or a palm-full of walnuts—for two, three-week periods. Fecal and blood samples were collected at the beginning and end of each period to assess secondary outcomes of the study, including effects of [walnut](#) consumption on fecal microbiota and bile acids and metabolic markers of health.

Walnut consumption resulted in higher relative abundance of three bacteria of interest: *Faecalibacterium*, *Roseburia*, and *Clostridium*.

"The microbes that increased in relative abundance in this walnut study are from one of the *Clostridium* clusters of microbes, and there's increased interest in those because they have the ability to make butyrate," Holscher says. "Unfortunately in this study we didn't measure butyrate, so we can't say that just because these microbes increased that butyrate did increase. We still need to answer that question.

"There is a lot of interest in *Faecalibacterium* because it has also been shown in animals to reduce inflammation. Animals with higher amounts also have better insulin sensitivity. There is also growing interest in *Faecalibacterium* as a potential probiotic bacteria, and so we are trying to follow up on foods that help support *Faecalibacterium*."

The findings also show, with walnut consumption, a reduction in secondary bile acids compared to the control. "Secondary bile acids have been shown to be higher in individuals with higher rates of colorectal cancer," Holscher explains. "Secondary bile acids can be damaging to cells within the GI tract, and microbes make those secondary bile acids. If we can reduce secondary bile acids in the gut, it may also help with human health."

Previous research that prompted this microbial research showed that the

amount of energy (calories) derived from walnuts after we eat them is less than previously thought.

"When you do calculations to determine how much energy we predicted we would get from eating walnuts, it didn't line up with the energy that was absorbed," Holscher says. "You're really only absorbing around 80 percent of the energy from walnuts that labels say. That means that the microbes get access to that extra 20 percent of calories and the fats and fiber left in them, and so what happens then? Does it produce a positive health outcome, or a negative health outcome? Our study provides initial findings that suggest that the interactions of microbes with the undigested walnut components are producing positive outcomes.

"We need more research to look at additional microbial metabolites and how those are influencing [health](#) outcomes, instead of just characterizing the changes in the microbiome," Holscher says.

More information: "Walnut consumption alters the gastrointestinal microbiota, microbially derived secondary bile acids, and health markers in healthy adults: a randomized controlled trial," *The Journal of Nutrition* (2018). [DOI: 10.1093/jn/nxy004](https://doi.org/10.1093/jn/nxy004)

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