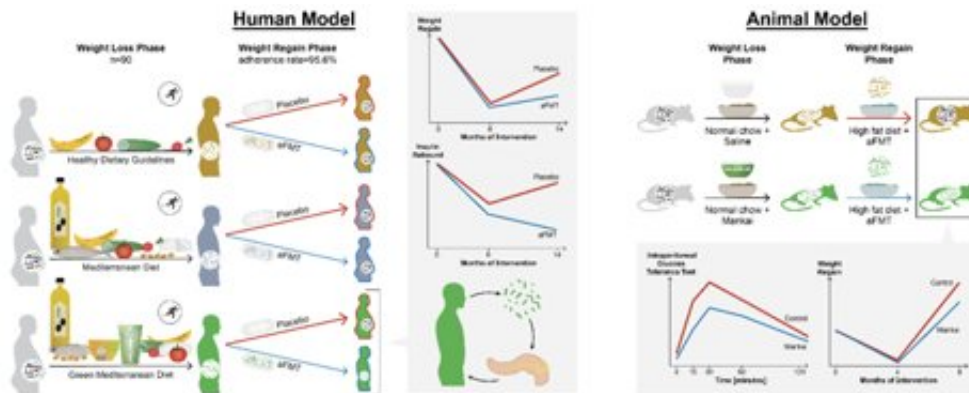


Consuming your own fecal microbiome when dieting may limit weight regain

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In the weight loss trial, abdominally obese or dyslipidemic (high cholesterol) participants in Israel were randomly assigned to one of three groups (1) healthy dietary guidelines, (2) Mediterranean diet, and (3) green-Mediterranean diet. In the green-Mediterranean diet group, participants were provided with Mankai. In a complementary Mankai-specific mouse model experiment, the researchers were able to reproduce the effects of weight-nadir-based transplantation on weight regain and insulin sensitivity, and to isolate the specific contribution of Mankai consumption to induce these effects. Credit: Ben-Gurion U.

People who consume frozen microbiome capsules derived from their own feces when dieting may limit their weight regain, according to a new study published in *Gastroenterology*, conducted by a team of researchers led by researchers at Ben-Gurion University of the Negev (BGU).

In an unprecedented, 14-month clinical trial in Israel, Prof. Dr. Shai, BGU Ph.D. student Dr. Ehud Rinott and Dr. Ilan Youngster from Tel-Aviv University, collaborated with a group of international experts from U.S. and European research institutes.

"It is well known that most [weight-loss](#) dieters reach their lowest body weight after 4-6 months, and are then challenged by the plateau or regain phase, despite continued dieting," says Dr. Shai, a member of the School of Public Health. In this groundbreaking study, the international group of researchers explored whether preserving the optimized personal microbiome from fecal transplants after six months of weight loss helps maintain weight loss by transplanting back the optimized microbiome during the subsequent expected regain phase.

In the weight loss trial, abdominally obese or dyslipidemic (high cholesterol) participants in Israel were randomly assigned to one of three groups (1) healthy dietary guidelines, (2) Mediterranean diet, and (3) green-Mediterranean diet. After six months during the weight-loss phase, 90 eligible participants provided a fecal sample that was processed into aFMT by frozen, opaque and odorless capsules. The participants were then randomly assigned to the groups that received 100 capsules containing their own fecal microbiota or placebo which they ingested until month 14.

In the green-Mediterranean diet group, participants were provided with Mankai, a specific duckweed aquatic strain in a green shake, green tea and 28g of walnuts. This was the group diet strategy that induced the largest significant change in the gut microbiome composition during the weight loss phase.

The 90 participants lost 8.3 kg (18.2 lbs.) on average after six months, However, only in the green-Mediterranean diet group did aFMT limit weight regain from only 17.1%, vs 50% for the placebo.

"The green-Mediterranean diet also resulted in preservation of weight loss-associated specific bacteria and microbial metabolic pathways, mainly glucose transport, following the microbiome intervention, compared to the control," says Dr. Rinott.

In a complementary Mankai-specific mouse model experiment conducted by Prof. Omry Koren at Bar-Ilan University, the researchers were able to reproduce the effects of weight-nadir-based transplantation on weight regain and insulin sensitivity, and to isolate the specific contribution of Mankai consumption to induce these effects.

"This study is the first of its kind to prove in humans that preservation of an "ideal" gut microbial composition can be used at a later time point to achieve metabolic benefits," says Dr. Youngster, director of the Pediatric Infectious Diseases Unit and the Center for Microbiome Research at Shamir Medical Center. "Using the patient's own stool after optimization is a novel concept that overcomes many of these barriers. It is my belief that the use of autologous fecal microbiota transplantation will be applicable in the future for other indications as well."

Furthermore, green plant-based diet such as Mankai, better optimizes the microbiome for the microbiota transplantation procedure. This potentially optimizes the conditions for the aFMT, collected during the maximal weight loss phase. The Mankai duckweed aquatic plant is being grown in Israel and other countries in a closed environment and is highly environmentally sustainable—requiring a fraction of the amount of water to produce each gram of protein compared to soy, kale or spinach.

According to Professor Omry Koren, at Bar-Ilan University who led the animal experiments: "The nutrition-microbiome axis has been proven in this study as high polyphenols diet, and specifically, Mankai, a protein-based plant and dietary fibers could ideally optimize the microbiome in the weight loss phase, to induce potent microbiome to recall the flora of

germs related to regain attenuation and improved glycemic state after transplantation."

"These findings might be a good application of personal medicine," says Dr. Shai who is also an adjunct professor at Harvard. "Freezing a personal microbiome bank could be an effective way to maintain healthy weight while dieting as the rapid weight loss phase is accompanied by optimal cardiometabolic state. By optimizing the composition and function of the gut microbiome within the host, we have a novel approach for metabolic-memory preservation: taking a sample of the gut [microbiome](#) in its ideal phase, and administrating it when dieters start regaining their lost [weight](#)."

More information: Ehud Rinott et al, Effects of Diet-Modulated Autologous Fecal Microbiota Transplantation on Weight Regain, *Gastroenterology* (2020). [DOI: 10.1053/j.gastro.2020.08.041](https://doi.org/10.1053/j.gastro.2020.08.041)

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