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“Dietary Protein Intake of Subjects Participating Remotely in a Randomized Control Trial Investigating the Effect of Dietary Protein on the Gut Microbiome”

INTRODUCTION: The effect of diet quality on gut microbiome composition and its resulting breakdown products is an increasingly popular research topic. The gut microbiome is understood to be greatly affected by dietary changes, notably shifts in fiber, which can have various subsequent physiologic effects on the body. The American diet contains inadequate amounts of dietary fiber but excessive amounts of dietary protein, which can also be fermented/putrefied by gut bacteria. The impact of dietary protein on the gut microbiome is poorly understudied, though a greater amount of dietary protein than fiber may reach the colon. The bacterial fermentation of dietary protein results in several products, which are either excreted, utilized by colonic microbes, or further detoxified by the colonic epithelium. Some of these metabolites have detrimental effects. We designed a randomized controlled trial that investigates the effect of excess protein on the gut microbiota and its metabolites.

METHODS: Remotely located participants who qualified for the study were randomly assigned to add 50 grams of either whey (animal-based) or pea (plant-based) protein supplement to their usual dietary intake for seven days. Participants were asked to consume 50 g of supplemental protein daily on top of their usual dietary intake. Each protein supplement was provided in a 1.8 lb. jug of vanilla, chocolate, or unflavored supplement manufactured by Now Foods (Bloomington, IL). Participants were asked to recall the food they consumed both before collecting their first fecal sample and after collecting their second fecal sample using the National Cancer Institute’s Automated Self-Administered 24-Hour Dietary Assessment Tool (ASA24).

RESULTS: Fifty-one participants completed the study, 23 of whom consumed the whey supplement and 28 of whom consumed the pea supplement. Dietary protein intake before adding the supplement was not significantly different between the whey (124 ± 13 g/day) and pea protein (112 ± 12 g/day) groups. After seven days of supplement consumption, the participant’s usual dietary protein intake (no supplement included) dropped slightly (113 ± 11 g/day (Whey) vs. 99 ± 12 g/day (Pea)) but not significantly. Compared to the start of the study, both groups showed a significant increase in dietary protein after adding the protein supplement to their normal intake (164 ± 12 g/day (Whey, $P=0.02$) vs. 151 ± 12 g/day (Pea) $P=0.02$), but there was no significant difference in added dietary protein intake between the two groups.

CONCLUSIONS: Participants successfully increased their protein intake, demonstrating the intervention’s success. We can be confident that the changes in the gut microbiome and its metabolites can be attributed to dietary protein.