Fecal Nitrogen Analysis on Protein-Supplemented Individuals

Alexander W. Nguyen, Lauri O. Byerley

Department of Physiology, School of Medicine, Louisiana State University Health Sciences Center, New Orleans, LA

Introduction

- Individuals wanting to gain muscle mass often consume more dietary protein.
- Only a few studies have investigated dietary protein's effect on gut microbial metabolic pathways.
- A previous cross-sectional study found that higher protein intake correlates with increased colonic nitrogen and purine and pyrimidine metabolites.
- The primary sources of dietary nitrogen are protein and purines.
- The fecal nitrogen content could be a good biomarker for protein intake.
- Fecal matter's complexity makes it challenging to develop a method for quantifying nitrogen (Figure 1).
- Once developed, our lab plans to use the method to investigate the nitrogen content of stool samples collected from healthy individuals before and after an increase in protein intake (Figure 2).

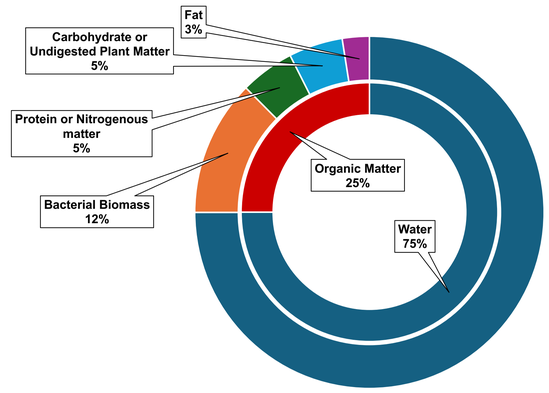

Figure 1. Complexion of Fecal Matter

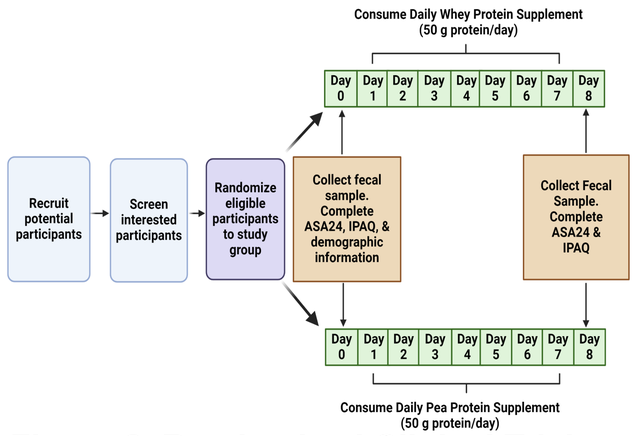

Figure 2. Randomized Clinical Trial Timeline

Results

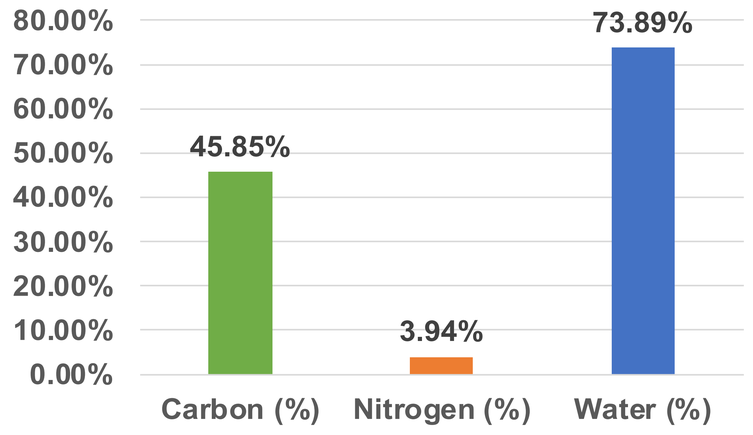

Figure 4. Composition of a Fecal Test Sample

Conclusion

The method developed (Figure 3) successfully detected nitrogen in fecal matter (Figure 4), laying the path for exploring its use as a biomarker of dietary nitrogen intake.

Purpose

To develop a method quantifying fecal nitrogen content and then use it to quantify the fecal nitrogen content of samples from our randomized clinical trial.

Method

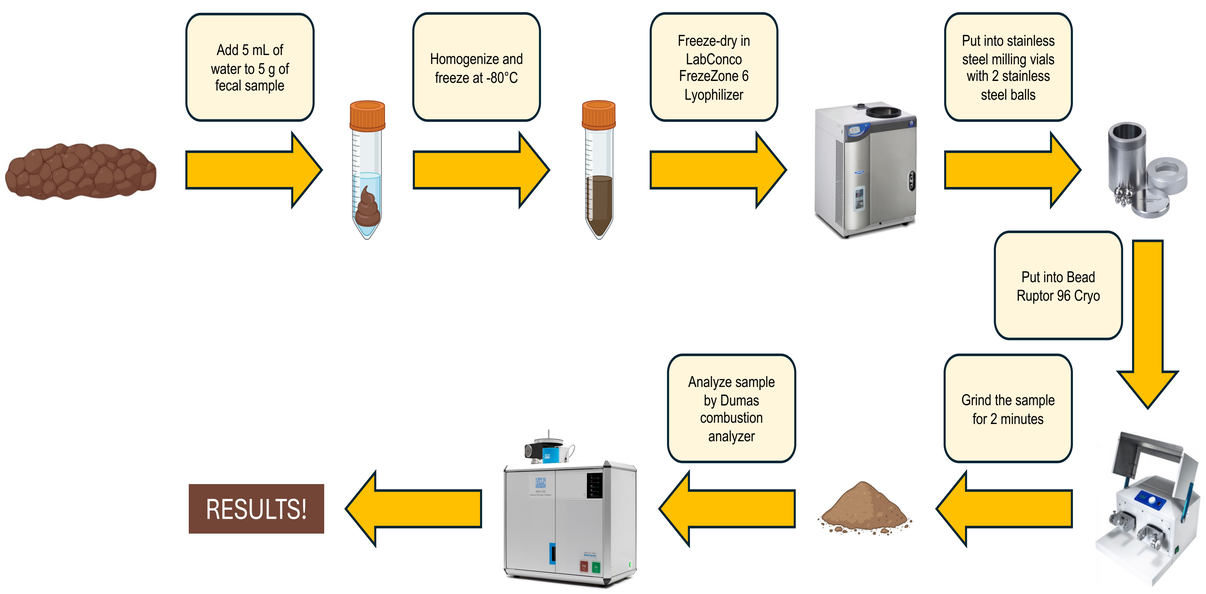

Figure 3. Fecal Nitrogen Method

Future Directions

- Fecal nitrogen's use as a biomarker of dietary protein intake needs to be determined.
- This biomarker would be useful in confirming that participants of the randomized clinical trial increased their protein intake as assigned.
- The long-term goal of the randomized clinical trial is to establish a microbiota and metabolomic pattern associated with dietary protein.

Funding provided by the American Public University System.

This research project was supported by Award Number: DBI-2051440 through the National Science Foundation (NSF), Research Experiences for Undergraduates (REU) Program