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## Assessment of Diet in Patients with Inflammatory Bowel Disease: A Collaboration of Behavioral and Basic Scientists


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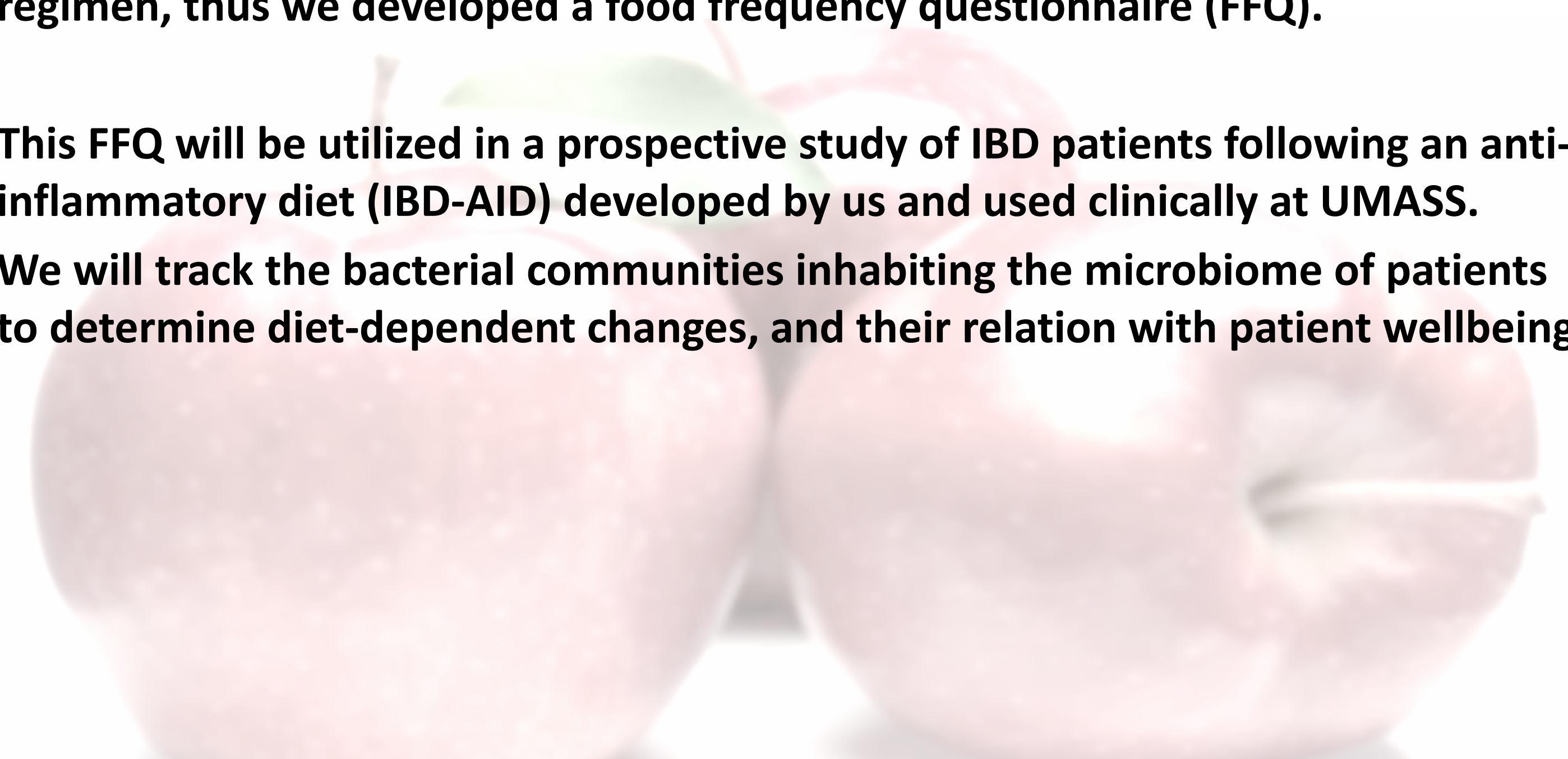
## BACKGROUND

### Inflammatory Bowel Disease

Clinical research to develop treatment for inflammatory bowel disease (IBD) is focusing on a nutritional regimen restricting certain carbohydrates while incorporating the use of an optimal diet that includes prebiotic and probiotic foods.

Current assessments are not able to measure elements of this nutritional regimen, thus we developed a food frequency questionnaire (FFQ).

This FFQ will be utilized in a prospective study of IBD patients following an anti-inflammatory diet (IBD-AID) developed by us and used clinically at UMASS. We will track the bacterial communities inhabiting the microbiome of patients to determine diet-dependent changes, and their relation with patient wellbeing.



### Objectives

1. Develop an FFQ capable of identifying dietary components important to IBD: prebiotics, probiotics, beneficial nutrient intake, and avoidance of certain foods.
2. Determine diet-dependent changes of the gut microbiome

### What are Probiotics and Prebiotics?

Probiotics: Contain live, beneficial bacteria



Prebiotics: type of fiber that specifically encourages beneficial bacterial growth.

Examples: inulin and oligofructose, beta glucans

Good sources of include: artichokes, leeks, bananas, steel cut oats, dark leafy greens



## METHODS

### Methodology

Foods and food groups (270) were categorized and grouped according to criteria of interest:

- 1) Prebiotics,
- 2) Probiotics,
- 3) Balance of nutrients according to the Dietary Guidelines,
- 4) Avoidance of foods thought to be adverse, and
- 5) Unknown effect.
- 6) Each food has a referent serving size by which the patient can compare to record the serving (any part of, or more than that serving) they consumed.
- 7) A scoring method was then derived to assist with prospective correlation to changes in the microbiome.

Each patient completes the daily FFQ and submits stool samples, two or more times per week.

Each food has a referent by which the patient can compare the serving (any part of, or more than that serving) they consumed.

A scoring system based on capturing these 5 components will be examined against changes in diet, and changes in the microbiome.



## THE FUTURE OF NUTRITION ASSESSMENT

The Anti-inflammatory Diet for Inflammatory Bowel Disease (IBD-AID), is among other regimens based on the Specific Carbohydrate Diet. The IBD-AID is a nutritional regimen that restricts refined sugar, lactose, most grains and starch from the diet, while incorporating the use of a balanced, optimal nutrition that requires beneficial fatty acids, nutrients, and pre- and probiotic foods for best effect.

Dysbiosis, or altered bacterial flora, is central to the theory behind this diet.

Measurement of diet is essential to examine both compliance and association, thus, a food frequency questionnaire (FFQ) was developed.

The FFQ will then be utilized in a study to determine whether dietary influences on the gut microbiome coincide with alterations in gut inflammation in IBD patients.

### Acknowledgements

First and foremost, we are grateful to the patients who have trusted us with their health care, followed the diet, and are showing us the way to the future.

We are especially grateful to Sanjay, Susan, Neel and Evan Sharma, to Joan and Riff Freedman, and others for their vision of healing and improving the quality of life of patients with IBD with their generous donations to the

Center for Applied Nutrition.

Umassmed.edu/nutrition

## RESULTS

### Scoring

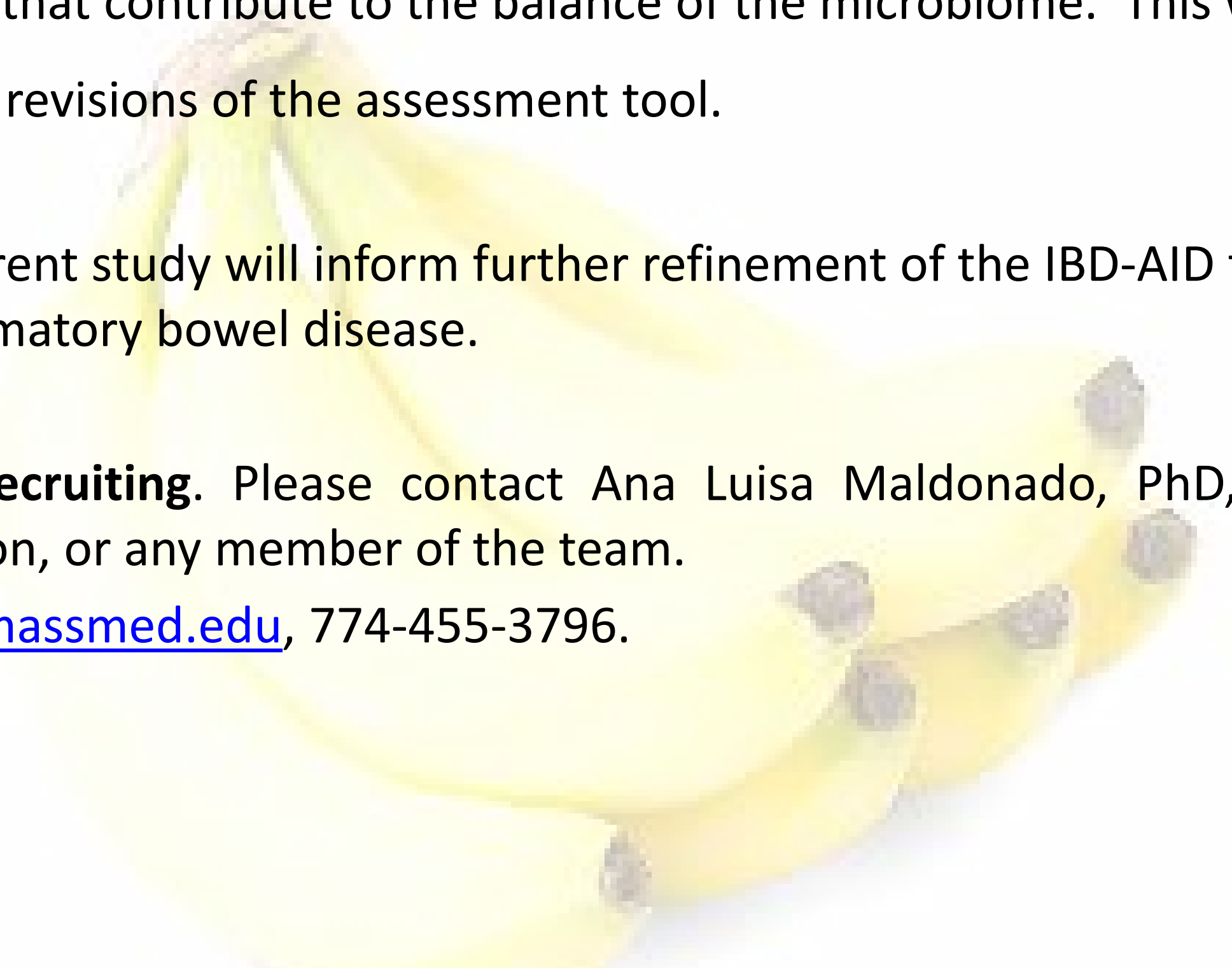
	# of servings per day to achieve Optimum Score
Prebiotic score	≥3
Probiotics score	≥2
Adverse foods score	0
<b>Optimum score</b>	<b>5</b>
Vegetables	5
Fruit	3
Nuts, seeds, good fat	2
Lean Protein (seafood, legumes, poultry)	4
Fiber, grains (oats, miso)	3
Probiotic dairy	3
Beneficial Beverages	6
<b>Optimum score</b>	<b>26</b>

### Recommendations and Conclusions

This is the first study to assess components of the diet in association with measurements of the microbiome. Further research will need to incorporate larger nutrition data sets and software capable of examining all nutrients and components of food that contribute to the balance of the microbiome. This will take time, and many revisions of the assessment tool.

Results from the current study will inform further refinement of the IBD-AID for patients with inflammatory bowel disease.

**We are currently recruiting.** Please contact Ana Luisa Maldonado, PhD, for additional information, or any member of the team.  
[Ana.Maldonado@umassmed.edu](mailto:Ana.Maldonado@umassmed.edu), 774-455-3796.



### Next Steps

This is a collaboration between basic scientists from the **Center for Microbiome Research**, the **Division of Gastroenterology**, and the **Center for Applied Nutrition**. We speak different languages of science, and have been meeting over the last 2 years for the purpose of addressing this central need in research.

The patients are demanding it, yet the doctors don't have guidelines or proof of efficacy.

We now have the ability to see this research through with the hope of developing clinical dietary guidelines for patients with inflammatory bowel disease.