



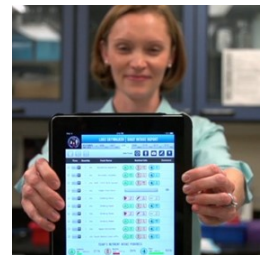
During the WVU Medicine Dietetic Internship, interns are given two weeks to gain experience in areas they normally would not be exposed to at WVU Medicine. Throughout my undergraduate and graduate school career, I took a specific interest in nutritional biochemistry and research and I have always been fascinated with space and our place in the universe. For one of my weeks of choice I reached out to the NASA Nutritional Biochemistry Laboratory to inquire

about a chance to intern for them and was able to get approval to work with Dr. Scott Smith, Director of the Nutritional Biochemistry Laboratory at the Johnson Space Center .



The main focus of the NASA Nutritional Biochemistry Laboratory is to determine the nutritional requirements for extended-duration space flight. Their current research centers on the role of nutrition in astronaut health, specifically studies evaluating bone loss and vision changes. Transporting and storing appropriate foods can be a challenge during space missions and food often has to be prepackaged. The biggest constraint in pre-packaged food is nutrient degradation. One year ago, astronauts on the International Space Station ate the first food grown in outer space grown from the “Veggie” plant growth chamber. These gardens are still in the testing phase and may flourish to become a larger portion of diets for astronauts.

Tracking calorie intake on the International Space Station (ISS) proved to be very difficult and time consuming for both the astronauts and researchers. To streamline the process, the Nutritional Biochemistry Laboratory created the ISS FIT (Food Intake Tracker) iPad app in 2016. Through an extremely friendly user interface, astronauts can select foods from an itemized list, take pictures of the food, labels, and barcodes, or voice record what they consumed. The results are printed daily and a dietitian documents the crews intake through an extensive excel spreadsheet. I was able to spend time working on these food intake records and documenting what types and quantities our astronauts are currently eating in space.



The Nutritional Biochemistry laboratory published a book in 2012, entitled “Space Nutrition.” This book is a great resource of further information regarding space nutrition and the inner working of the Nutritional Biochemistry Lab. A free PDF of the Space Book is available here: https://www.nasa.gov/sites/default/files/space_nutrition_book.pdf

I was able to spend two days with the two RDNs that work for contracting companies through NASA:

Holly Dlouhy, MS, RD, LD – KBRwyle, NASA

Holly collects and analyzes data about food intake of crew members in spaceflight missions from preflight, in-flight, and post-flight periods. She prepares adequate menus and diets for certain research studies and works closely with the RDN who plans flight menus. She participated in the development of the nutritional recommendations for extended-duration space flight and provides diet-related nutrition counseling to the astronauts.

Michelle Pittman, RD, LD – Leidos, NASA

Michelle ensures adequate nutritional content of the food on the ISS and evaluates all recipes. The entire menu and recipes undergo extensive nutritional analysis every five years. She meets with each astronaut four times preflight to conduct taste-testing sessions where the astronauts score each menu item on a 1-9 scale. They are then allowed a Crew Specific Menu (CSM), which are additional containers for the crew to bring along with them comprised of their top choices.

Fun Facts

1. It costs over \$11,000/lb to fly supplies into space. Freeze-drying food helps preserve it and reduces cost (lighter)
2. Dr. Smith’s old office space was Neil Armstrong’s bedroom!
3. Antioxidants in food may reduce space radiation effects..
4. Astronauts eat a lot of burritos as the surface tension and viscosity hold contents together, as opposed to sandwiches.
5. The crew gets 30 minutes to eat each meal.

