

NASA Space Food Systems Laboratory Overview



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Space Food History

- Mercury & Gemini - Tubes and cubes
- Apollo - First dishes
- Skylab - Only system to be fully refrigerated
- Shuttle - Jumping point for ISS food system



Space Food System Considerations



Nutrition

Low sodium
Minimal fresh foods



Variety

Menu fatigue
Preference



Shelf stability

Safety
Quality
Minimal Fresh Foods



Long shelf life

Long lead times
Need on orbit inventory
Packaging



Microgravity/FOD

Foreign Object
Debris
Galley



Strict safety limits

No quick recalls or store visits
Packaging integrity
Microbial Load





ISS Standard Menu Food System

- Pantry based system: ~ 200 items
- Bulk Overwrap Bags (BOBs)
- 11 Categories:
 - Beverages and Straws
 - Breakfast
 - Fruit and Nuts
 - Rehydratable Meats
 - Meat and Fish
 - Side Dishes
 - Vegetables and Soups
 - Desserts and Snacks
 - Nutrition Bars
 - Condiments
 - Tortillas

ISS Standard Menu Food System

- Thermostabilized
- Freeze Dried
- Irradiated
- COTS (Commercial Off The Shelf)
 - Powdered Beverages
 - Dried Fruits/Intermediate Moisture
 - Natural Form
 - Condiments
- Repackaging for ease of use and shelf life



Thermos

- Flexible Pouches
- Retort facility at Texas A&M
- Transported to JSC for acceptance testing and stowing
- Around 50 on the standard menu



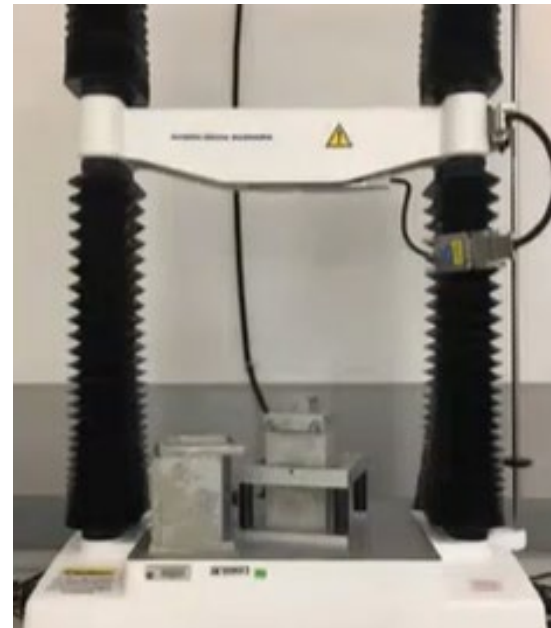
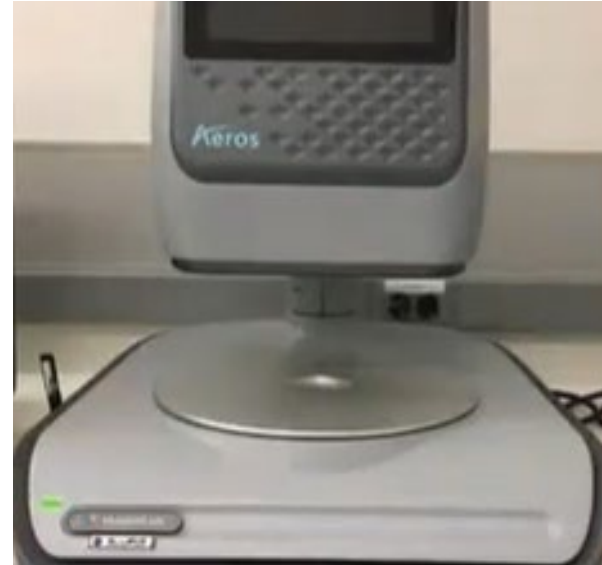
Freeze Dried

- Produced at JSC Food Lab – 2 freeze dryers
- Tested at JSC Food and Micro Labs
- Packaged at JSC Food Lab
- Around 50 items on the standard menu
- 200-300 lbs per production run



Testing

- Safety, quality, consistency, shelf-life
- Water Activity, Moisture, Headspace, Sensory, Micro, Color, Texture, Package Integrity



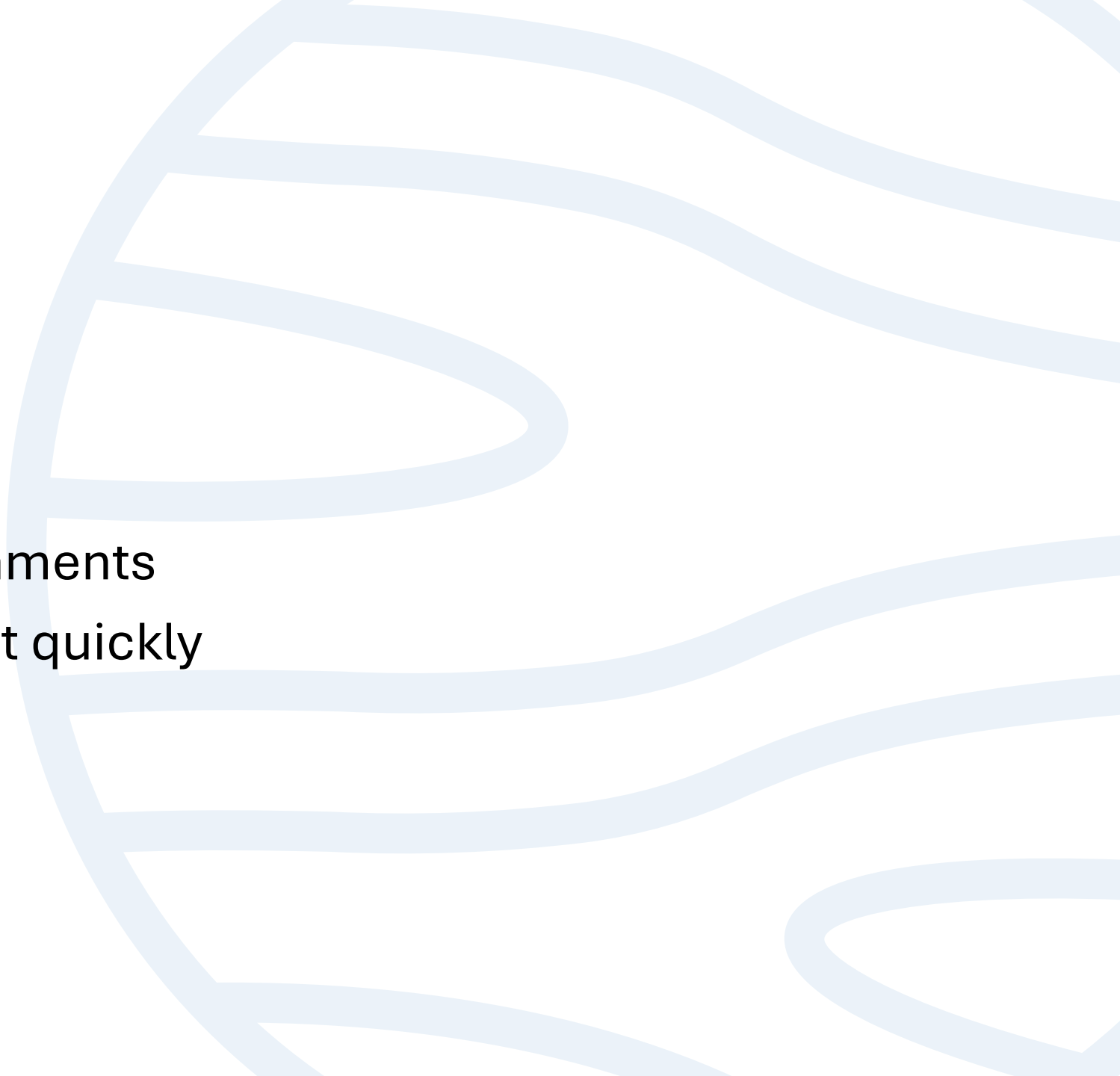
Supplemental Foods

- Each USOS Crew:
 - Crew Specific Menu
 - Coffee Tea Preference
- As Room on Vehicles Allow:
 - Shelf Stable Food Kits
 - Fresh Food Kits
- As cold stow room allows:
 - Cheese Kits
 - Frozen Treats



Research

- Extending shelf life
- Lowering weight
- Packaging options
- Ranges of storage environments
- Less ability to supplement quickly



Questions?

