Name: _____ Date: _____

NASA Facts: Space Food

1. Briefly describe the food on board each of the early space programs:

Mercury:

Gemini:

Apollo:

Skylab:

2. How are meals chosen for the Space Shuttle?

3. How do Space Shuttle astronauts prepare their foods for eating?

4. How do Americans and Russians work together to design the menus for the International Space Station?

5. Do astronauts need different nutrients than us? Explain.

6. Why do astronauts need to limit their iron intake?

7. Why is sodium limited?

8. Why do they need extra vitamin D?

9. What kind of physiological changes as the body adapts to weightlessness?

10. Why do they need to be sure they eat enough calories?

11. How would trips to Mars affect astronauts' diets in the future?

12. What would be the food packaging challenges on Mars?

NASA Facts

National Aeronautics and
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Space Food

Many people ask NASA about what and how the astronauts eat aboard the space shuttle and the space station. The foods they eat are not provided in tubes and they are neither bland nor unsavory. Food systems and menu items have evolved tremendously since the days of the Mercury Program. Here's a look at how food systems and menu items have evolved, what and how astronauts in space eat now and what future voyagers may eat.

History

The food that NASA's early astronauts had to eat in space is a testament to their fortitude. John Glenn, America's first man to eat anything in the near-weightless environment of Earth orbit, found the task of eating fairly easy, but found the menu to be limited. Other Mercury astronauts had to endure bite-sized cubes, freeze-dried powders and semi-liquids packaged in aluminum tubes. Most agreed the foods were unappetizing and disliked squeezing the tubes. Moreover, freeze-dried foods were hard to rehydrate and crumbs had to be prevented from fouling instruments.

Eating on the Gemini missions improved somewhat. Bite-sized cubes were coated with gelatin to reduce crumbling, and the freeze-dried foods were encased in a special plastic container to make reconstituting easier. With improved packaging came improved food quality and menus. Gemini astronauts had such food choices as shrimp cocktail, chicken and vegetables, butterscotch pudding, and applesauce, and were able to select meal combinations themselves.

By the time of the Apollo Program, the quality and variety of food increased even further. Apollo astronauts were the first to have hot water, which made rehydrating foods easier and improved the food's taste. These astronauts were also the first to use utensils via the "spoon bowl," a plastic container that could be opened and its contents eaten with a spoon. Thermostabilized pouches were also introduced on Apollo.

The task of eating in space got a big boost in Skylab. Unlike previous space vehicles for astronauts, Skylab featured a large interior area where space was available for a dining room and table. Eating for Skylab's three-member teams was a fairly normal operation: Footholds allowed them to situate themselves around the table and "sit" to eat. Added to the conventional knife, fork and spoon was a pair of scissors for cutting open plastic seals. Because Skylab was relatively large and had ample storage area, it could feature an extensive menu: 72 different food items. It also had a food freezer and refrigerator – a convenience no other vehicle has offered, before or since.

Space Shuttle Food System

The kinds of foods crewmembers eat aboard the space shuttle are not mysterious concoctions, but foods prepared here on Earth. Many are commercially available on grocery store shelves. Astronauts select their own menus from a large array of food items. Diets are designed to supply each astronaut with 100 percent of the daily value of vitamins and minerals necessary for the environment of space.

Foods flown on space missions are researched and developed at the Space Food Systems Laboratory at the Johnson Space Center (JSC) in Houston, which is staffed by food scientists, dietitians and engineers. Foods are analyzed through nutritional analysis, sensory evaluation, storage studies, packaging evaluations and many other methods.

Food evaluations are conducted with shuttle flight crews about eight to nine months before the scheduled launch date. During the food evaluation sessions, the astronaut samples a variety of foods and beverages available for flight. Crewmembers choose their menus and can repeat days or not repeat days at their discretion. They plan a breakfast, lunch and dinner; snacks are listed with the meals. Types of food available include rehydratable, thermostabilzed, irradiated and natural form items.