

FOOD DESIGNED FOR SPACE

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(8) *Fresh foods* like fruits and vegetables only last for the first two days of a space mission. Bread is not permitted due to crumbs but *extended shelf-life bread products* have been designed like tortillas, waffles and rolls. *Condiments* like salt is dissolved in water and pepper oil is used instead of flakes. Ketchup, mayonnaise and hot sauce is also available.

(9) Not only does the food have to be carefully designed, so does the equipment used to eat the food. All the food is sealed in containers or pouches that are kept secure on trays by Velcro fasteners or straps. Scissors are used to cut open pouches and moist towelettes are used to clean hands at the end of meals.

(10) You might not think that an astronaut should care that much about food, but good tasting food is important to everyone. The crew of the Gemini III mission snuck aboard a corned beef sandwich for their commander who loved eating them. The astronauts were reprimanded for this act by NASA when it was discovered. The challenges of making tasty food is made more difficult because microgravity causes fluid to build up in the upper body, causing permanently stuffed up noses and preventing a good sense of smell. When food can't be smelled properly, it also loses taste. It is essential that food taste good so that astronauts don't lose the motivation to eat, especially on long space missions.

Article Questions

- 1) Why is it possible to eat and swallow food in space even if there is very little gravity?
Peristalsis, which is the involuntary wave-like contraction of the esophagus, pushes food from your throat to your stomach. This does not require gravity. (1)
- 2) Why is a straw needed to drink beverages?
Without a straw, beverages would float out of the container due to the lack of gravity. The straw helps deliver the beverage directly from the pouch to the mouth. (4)
- 3) Describe three methods used to decrease the chances that microorganisms will spoil the food.
 - 1) Dehydrating food removes the water that microorganisms need to grow. (3)
 - 2) Heating food before packaging it kills microorganisms that spoil food. (7)
 - 3) Exposing food to ionizing radiation before packaging kills microorganisms that could spoil food. (7)
- 4) Why is salt dissolved in water and pepper oil used instead of regular salt and pepper?
Regular salt and pepper comes in very small solid pieces that would disperse all over the space shuttle if they were used in the traditional way that they are used on Earth. (8)
- 5) When it comes to sitting down for a meal, what challenges do you think an astronaut might face that we don't? Provide solutions to these challenges.
Astronauts would have to worry about floating away from their seat. They can be provided with leg straps or seatbelts to hold them down onto a seat. They would also have to worry that their cutlery and food containers would also float away. Velcro and other types of fasteners can be used to keep cutlery and food packages secured. (9)
- 6) Why does food not taste as delicious in space as it would on Earth?
Due to microgravity, fluid builds up in the upper bodies of astronauts. This causes them to have stuffed up noses that prevent proper smell. Since smell and taste are linked, without being able to smell properly, food doesn't taste as good. (10)