From home-grown food to spaceship-grown food; meet the space salad

By Smithsonian.com, adapted by Newsela staff on 04.05.18
Word Count **685**
Level **860L**

Astronauts on the International Space Station are ready to sample their harvest of a crop of "Outredgeous" red romaine lettuce from the Veggie plant growth system that tests hardware for growing vegetables and other plants in space. Photo by: NASA

In the early years of space travel, astronauts squeezed most of their meals out of tubes. A sugary, orange-flavored drink, sold in stores as Tang, was considered a tasty treat. Food was just fuel. It definitely wasn't tasty.

However, eating in space has become much less a chore now. In fact, astronauts can dine on a variety of freeze-dried meals. They just have to be rehydrated with hot water. And, as of a few years ago, crews on the International Space Station (ISS) are able to enjoy a taste of food that's actually fresh.

"On the space station right now, they are growing vegetables, lettuce in particular," says outer space expert Carie Lemack. "We're seeing the space salad. That's remarkable."

Producing Food In Space

Lemack is the head of DreamUp, a group that gives students the chance to work on projects connected to outer space. On March 30, she appeared at Future Con, an event held in Washington, D.C. She was there to discuss the successes and challenges of producing food in space.

Lemack was joined by Sam Anas and Valkyrie Falciani. Anas is a scientist who has been studying plants for more than 40 years. Falciani is a Stockton University student who helped develop an experiment done on the space station last year.

How Plants Grow Without Gravity

Scientists are very eager to figure out how to grow plants in space. Without a source of fresh food, living on the moon or Mars and taking long space journeys would be much more difficult.

Both Anas and Falciani know how hard growing plants can be without Earth's strong gravitational pull. In most parts of outer space there is very little gravity. This state of weak gravity is known as microgravity.

Anas explained that ordinarily the roots of a plant are pulled downward by gravity. So they grow down into soil. A plant's shoots, on the other hand, move up toward light.

Roots Can Go "Anywhere"

In microgravity things change, though. Light becomes a stronger force than gravity. Instead of growing down into the soil, the roots can go "anywhere," Anas said.

Without gravity, plants in space can grow in every direction "like spaghetti," Falciani said. As a result, they don't grow well and are not healthy.

"And there's a problem with water in space," she said. "It kind of sits wherever it's placed. It doesn't drain down into soil." To get the water moving, it has to be shaken.

Fungal Spores

Falciani's experiment was developed with classmate Danielle Ertz. It was designed to study the effects of microgravity on fungal spores. Fungal spores are like seeds for mushrooms and other fungi.

Falciani and Ertz sent the space station a container with three sections. One held flax seeds, one held fungal spores and the third was filled with water. The spores needed to mix with the flax seed to grow, and the water was needed to activate the growth. After an astronaut mixed the three elements, the tube was set aside for 30 days in space. A tube was also mixed on Earth. This would help show the difference between the tube on Earth and in space.

After the container was returned from the ISS, Falciani and Ertz discovered something strange. The fungal spores were not dead, but they hadn't grown at all. Falciani says they are trying to figure out why that happened. They do know that the spores that were sent into space now look different than similar ones kept on Earth.

People Living And Working Off Earth

"A movie like 'The Martian' made people start thinking more about food in space," Lemack said. It made people realize that producing food in space is not easy.

There are big differences between living and working on Earth and living and working in microgravity or on Mars, Lemack said. Mars is smaller than Earth, so its gravity is weaker.

Lemack says DreamUp's main goal is making sure there are enough people who are prepared to live and work in space. "And that doesn’t just mean scientists and engineers," she said. It also means farmers and chefs.

Quiz

1 Read the paragraph from the article.

> *However, eating in space has become much less a chore now. In fact, astronauts can dine on a variety of freeze-dried meals. They just have to be rehydrated with hot water. And, as of a few years ago, crews on the International Space Station (ISS) are able to enjoy a taste of food that's actually fresh.*

HOW does this paragraph support the main idea of the article?

(A) It shows that space food has not improved much since it was inside of tubes.

(B) It shows how space food has started to change in the last few years.

(C) It shows that astronauts have been frustrated with a lack of food variety.

(D) It shows that astronauts eat primarily fresh vegetables on the ISS.

2 One MAIN idea of the article is that in order to travel further in space and live on other planets, humans must find better ways to grow food in space.

What is another MAIN idea of the article?

(A) The Earth's gravity is much stronger than Mars' gravity.

(B) The fungal spores in the experiment did not grow or die.

(C) Growing food in space can be difficult because of mircrogravity.

(D) Astronauts are starting to have better tasting food in space.

3 What is the relationship between Earth's gravity and the growth of plants?

(A) The Earth's gravity forces a plant's roots to grow down where water will reach them.

(B) The Earth's gravity is less important to a plant's growth than the amount of light the plant receives.

(C) Plants can grow stronger and healthier when there is less gravity pushing them down.

(D) Plant growth is slower and roots grow in all directions when exposed to stronger gravity.

4 What effect did being in space have on the the fungal spores on the International Space Station?

(A) The spores grew faster and stronger than the spores on Earth.

(B) The spores grew roots in all directions unlike the spores on Earth.

(C) The spores in space grew slower than the spores on Earth did.

(D) The spores did not grow but seem different than spores left on Earth.