



March 1, 2017 (JST)
Yakult Honsha Co., Ltd.
Japan Aerospace Exploration Agency (JAXA)

**Announcement on the initiation of the experiment consuming probiotics
(Lactobacillus casei strain Shirota) on the International Space Station**
– Research on the impact on the immune system and
intestinal microbiota of astronauts –

Yakult Honsha Co., Ltd. (Yakult) and the Japan Aerospace Exploration Agency (JAXA) have been jointly researching the effect of probiotics on the human immune system and intestinal microbiota in a microgravity environment^{*1} since FY2014. This joint research aims to contribute to maintaining and improving the health and performance of astronauts. It is also intended to make contributions toward promoting human health in general by utilizing the knowledge gained in this joint research for the development of probiotics^{*2} research on the ground.

It is ready to begin the world's first experiment of consecutive consumption of probiotics by crewmembers on ISS, based on the outcomes of ground-based research activities conducted from FY2014 to FY2015, and the storage test of the capsule containing freeze-dried live probiotic bacteria (Lactobacillus casei strain Shirota^{*3}) on board of the ISS conducted in FY2016. It was confirmed that the number of live probiotics in the flight sample was equivalent to those in the ground control samples.

Yakult and JAXA will initiate the space experiment from 2017, which is a scientific study of the effect caused by the consecutive consumption of probiotics on the human immune system and intestinal microbiota of astronauts staying on the ISS for long periods of time.

<*1> JAXA Press Releases March 19, 2014 (JST)

http://global.jaxa.jp/press/2014/03/20140319_yakult_e.html

<*2> Live microorganisms which when administered in adequate amounts confer a health benefit on the host (FAO/WHO, 2001)

<*3> Lactobacillus casei strain Shirota is a probiotic strain with accumulated evidences on reaching intestine alive, maintaining and improving intestinal microbiota and immune function. The US Food and Drug Administration (FDA) has accredited the strain as being Generally Recognized As Safe (GRAS).



Lactobacillus casei
strain Shirota

<Reference>

■ 62nd Japan Aerospace Environment Medical Society, 30th Japan Space Biological Science Society at Aichi Medical University on October 14, 2016.

Presenter: Dr. Satoshi Furukawa, Group leader of Space Medical Biological Research, JAXA

Title: Assessment of the effect of the space environment on the viability of probiotics



Capsules containing freeze dried
Lactobacillus casei strain Shirota.
Five capsules contain at least 40
billion live bacteria.

<Summary>

Before initiating the space experiment on the consumption of probiotics by astronauts on the ISS, given the need for long periods of storage at ambient temperature for the space experiment, a long-term storage test lasting nine months was conducted on the capsules that contained freeze dried and not liquid “Lactobacillus casei strain Shirota.” The capsules were then subjected to a storage test on the ISS (KIBO) in order to analyze the effect of the space environment on the viability of probiotics.

In April 2016, the capsules were launched to the ISS by SpaceX CRS-8 (Dragon), stored for about one month, and then returned to Earth for analysis. It was confirmed that the numbers of live bacteria were maintained on the ISS as compared with the numbers of live bacteria on the ground.