IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Space Culture – Public Engagement in Space through Culture (9)

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ENHANCING CULTURAL EXCHANGE THROUGH FOOD IN SPACE

Abstract

The human experience of food extends far beyond that of mere nourishment. Debriefs with astronauts tell us that food is a key creature comfort in spaceflight, and it will have an even more significant role for long duration space travel and future life on other planets. The kitchen module on the International Space Station plays a critical role in bonding and cultural exchange between astronauts. Astronauts inhabiting the ISS have different backgrounds and native tongues and weekly family meals are a time to connect. However, dining in the environment of space is entirely different than the eating rituals experienced on Earth. Our sensory perception of food is altered due to the physiological impact of micro-gravity and the influence of new domains. How might these exchanges and new practices shape new food cultures? Food in space has moved beyond that which is simply developed down on Earth for space purposes. A new food culture and interplanetary fusion cuisine will emerge as a result of the unique environmental and behavioral factors of space travel. For example, Algae Caviar–tiny liquid filled spheres made of algae grown in space and created using the molecular gastronomy technique spherification–is a closed-loop food system uniquely developed by our Lab for space. Fermented foods in space will improve astronaut microbiome [1] and provide a solution for food waste management by fermenting food from leftovers. How can we use fermented foods to enhance the sharing of cultures in the international and non-national space of space? Running an evolution experiment in space, by way of fermentation, could have implications and applications not just for how organisms evolve in space, but for other extreme environments. This paper will address the unique challenges associated with eating in space, including degradation of nutrients, limited access to diverse and fresh ingredients, waning or shifting appetite [2], and communal and cultural experience sharing for mental wellbeing.

[1] Morrison, Michael D., et al. "Comparison of Bacillus Subtilis Transcriptome Profiles from Two Separate Missions to the International Space Station." Nature News, Nature Publishing Group, 7 Jan. 2019, www.nature.com/articles/s41526-018-0061-0Abs1.

[2] Campbell, Caroline L, et al. "Designing Foods for Satiety: The Roles of Food Structure and Oral Processing in Satiation and Satiety." NeuroImage, Academic Press, 2 Sept. 2016, www.sciencedirect.com/science/article/pii