

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Advanced Systems, Technologies, and Innovations for Human Spaceflight (7)

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CREATING HUMAN EXPERIENCE THROUGH FOOD IN SPACE

Abstract

September 12, 2022

The Artemis mission has motivated further advancements and developments in the Space arena. There has been an increase in private space companies, sprucing up to innovate and produce space products. NASA (National Aeronautics and Space Administration) and CSA (Canadian Space Agency) has sanctioned the Deep Space Food challenge, calling all food innovators around the world to take on the challenge of developing novel food production technologies that can support long-duration missions. The challenge is slated to complete by 2024, which is the same timeline as Artemis's plan of returning astronauts to the Moon. This was part of the motivation for Creating of Human Experience through Food (C.H.E.F.) in Space project with a goal to serve gourmet food that provides space travelers an exceptional dining experience. It addresses the challenges of catering to individual's palate, nutrition and caloric intake, while also enjoying a great tasting meal. The C.H.E.F. architecture is part of promoting commercial human spaceflight expeditions. Since there are considerations on converting the ISS (International Space Station) into a hotel that accommodates space tourists, the space kitchen module proposes to meet the passengers' food needs. Historically, astronauts are provided a set menu for their space journey and space food is limited to pre-packaged meals that are prepared to either be rehydratable, thermostabilized, irradiated, or introduce intermediate moisture.⁴ Other courses are packed in clear, flexible pouches that are ready to eat with no preparation required. Cooking methods in ISS are also limited to using microwave oven, convection oven, or hot water to heat or cook the food.⁵ Food tastes different in space and based on the conditions that astronauts may experience in space, it could change their appetite for certain foods. The concept of C.H.E.F. proposes a food technology system that prepares, cooks, and serves the food in an automated fashion using existing state-of-the-art automation technologies integrated to create a space kitchen module that retrofits into the ISS. It caters to space tourists with ISS as their destination. The use of a pressure cooker concept is introduced to cook food per astronauts' or space tourists' request in a shorter period of time. The Speedee Service System is applied from the food preparation process to food delivery to create that exceptional food service.