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BAKE IN SPACE: TO BOLDLY BAKE WHERE NOBODY HAS BAKED BEFORE

Abstract

The current provisions for food in microgravity are not sustainable for future human space exploration missions to the Moon and especially to Mars. Life in space manages to address only the basic nutrition requirements and the technical challenges associated with food preparation in microgravity in near Earth orbit. In addition it is designed with a shelf life of 1-2 years so that issues of deterioration are not a concern. Current options rely on a constant supply from Earth, which is not a viable option the further humanity explores the solar system.

With the rise of space tourism, increased interest in revisiting the Moon and landing humans on Mars, food will play an important role. On the International Space Station, astronauts most look forward to a supply of fresh fruit. Those crew members who spend months in orbit often go long periods of time without eating any fresh produce. Bake In Space aims to change that by addressing the scientific and technical challenges relating to the production of fresh food in space.

The idea is to use bread as a stepping-stone to providing fresh food that will benefit the wellness and general quality of life of those living and working in space. It is a staple food that unites us all as humanity. It crosses many cultures and languages, and is included in many religious practices. Our civilisation on Earth began with agriculture and bread accompanied our progress so much so that bread became a symbol for quality of life. We want to give future astronauts and space explorers a 'taste of home'. What better a meal solution than a homemade sandwich developed for the best nutritional outcome.?

We take for granted the conditions on Earth that have led us to develop many tools and processes that are simply not possible in the unique environment of microgravity. We have developed a plan to test key bread-making processes including baking, mixing, preparing wheat and harvesting/cultivating wheat. Each of the steps will require new hardware items and food preparation processes to be developed first for microgravity and then onto the Moon and Mars.

This presentation will provide an overview of Bake In Space and its objectives, the long-term challenges to be addressed and the future outlook for human exploration missions to the Moon, Mars and beyond.