

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)  
Life Support, habitats and EVA Systems (7)

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SPACE FOOD FOR BONE HEALTH: VITAMIN D FORTIFIED CAMEL MILK WITH DATES  
SMOOTHIE (SMOOTHISS)

**Abstract**

**Background:** During space flight, astronauts are experiencing major biological and physiological adaptations to microgravity that may alter their health status, their performance, and ultimately the success of the mission. One major change is bone loss that is linked with the development of further complications such as insulin resistance and osteoporosis. Besides, appetite loss is also commonly reported by astronauts. It's important to elaborate new strategies to prevent these negative effects and guarantee successful space flights. Nutrition is a critical element to be integrated into these future strategies since it can contribute to bone loss prevention and maintain appetite. **Objectives:** The aim of this research is to develop a powdered palatable beverage based on local food ingredients, i.e. dates and camel milk, fortified with vitamin D, to study its sensory, nutritional and microbiological properties and demonstrate that these properties do not degrade with time, in space. **Methods:** Ingredients and recipe development: powder camel milk, date paste, vitamin D3 (800IU/quart) were used to prepare the samples. Two samples will travel to space and stay in the ISS for a period of 4 months while one control sample will stay on Earth. **Sensory evaluation:** performed by using a 7-point hedonic scale assessing attributes including color, aroma, texture by spoon, mouthfeel, taste and overall acceptability before launching and at return on Earth. **Ethical approval** was obtained to conduct this component of the project. **Nutritional properties** (vitamins, fat, sugar and protein content) and **microbiological properties** (total viable bacteria count, total coliform bacteria count, salmonella count, yeast and mold count) will be assessed before launching and at return on Earth. **Results:** Four different recipes were prepared by using different proportions of camel milk and date paste. Sensory evaluation was done in a sample of 26 participants, after obtaining their consent form. The sample with the greatest levels of satisfaction for the different parameters was selected. **Conclusion:** A recipe that has been evaluated, by consumers, as having acceptable sensory properties has been developed. The assessment of the nutritional and microbiological properties of the food samples, before launching and at return on Earth with comparison with an on-Earth control, will demonstrate the impact of a stay in space on food properties.