

## **Integrating Bioregenerative Foods into the Exploration Spaceflight Food System**

**Grace L. Douglas**

**NASA, Johnson Space Center, Houston, TX, US, 77058**

Food, the nutrition it provides, and the eating experiences surrounding it, are central to performance, health, and psychosocial wellbeing on long duration spaceflight missions. Exploration missions will require a spaceflight food system that is safe, nutritious, and acceptable for up to five years, possibly without cold storage. Many of the processed and packaged spaceflight foods currently used on the International Space Station will not retain acceptable quality or required levels of key nutrients under these conditions. The addition of bioregenerative produce to exploration missions may become an important countermeasure to the nutritional gaps and a resource to support psychosocial health. Bioregenerative produce will be central to establishment of Earth-independence as exploration extends deeper into space. However, bioregenerative foods introduce food safety and scarcity risks that must be eliminated prior to crew reliance on these systems. The pathway to Earth independence will require small-scale integration and validation prior to large scale bioregenerative dependence. Near term exploration missions offer the opportunity to establish small scale supplemental salad crop and fruit systems and validate infrastructure reliability, nutritional potential, and the psychosocial benefits necessary to promote further bioregenerative integration.