

<https://doi.org/10.7250/CONNECT.2023.072>

SUSTAINING A MARS COLONY THROUGH INTEGRATION OF SINGLE-CELL PROTEIN AND OIL PRODUCTION IN FOOD SUPPLY CHAINS

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Abstract – As humanity sets its sights on establishing a sustainable and prosperous colony on Mars, one of the key challenges to overcome is ensuring a reliable and nutritious food supply for settlers. While various solutions for food production on Mars have been proposed, there is a growing interest in the use of microorganisms as a means of producing essential nutrients. This review article highlights the advantages of utilizing single-cell protein and single-cell oil technologies to produce essential amino acids and fatty acids for the food supply chains of a Mars colony. We provide an analysis of the potential benefits, challenges and limitations of these solutions and outline the necessary steps to be taken in order to successfully integrate them into the infrastructure of a Martian settlement.

Keywords – *Biotechnology; food production; life support systems; Mars colonization; microorganisms; single-cell protein, single-cell oil; space agriculture; sustainability*