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SPACE FOOD AND NUTRITION IN A LONG TERM MANNED MISSION

Abstract

Fulfillment of space exploration mission is key, but much more important are the lives of the explorers. Keeping the astronauts alive, jolly and healthy for long term manned mission has recently being a major and important research area. A major contribution seems to be the food they eat. For short term space manned missions, astronauts food could be taken along with them from Earth, but for manned missions to the Moon, Mars and Venus which are the current research destinations for long term space missions, they must find a means for their nutrition such as growing plants and finding any other alternatives for their survival. As most of these proposed missions have being designed to be one way missions whereby the astronauts will not come back to the Earth. Good food and nutrition for astronauts help to keep their psychology and physiology in good shape. In this paper, solutions will be made on the various alternatives for feeding astronauts in the long term missions to various celestial bodies: Moon, Mars and Venus, where the atmosphere, gravity, soil, radiation and other conditions vary from one to the other and may not support germination, growth and development of plants. Therefore, review will be done on the following: having fore knowledge of how plants will grow on these celestial bodies by simulating their soils; using mathematical\theoretical models to get the growth rate of plants in relation to the gravity available on these celestial bodies by using available data from terrestrial growth (1g growth) and microgravity\microgravity simulations facilities; getting to where how the plants will be grown such as using green house method as a result of the atmosphere and radiation in these celestial bodies; and other various alternatives for growing plants and having the astronauts well nourished such as using aeroponics and hydroponics methods. A brief discussion will also be done on food choice for astronauts considering psychosocial and cultural factors.