

To Mars and back - with added flavour

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Abstract

This year marks the 50th anniversary of NASA's Apollo 11 mission to the moon. On 16th July 1969 a crew of three astronauts – Armstrong, Aldrin and Collins – launched from Cape Kennedy in Florida on a Saturn V rocket for the 1.534 million km round-trip to our natural satellite, which lasted 8 days 3 h 18 min and 35 s and culminated in the historic lunar landing and the first human-being to set foot on the moon. Half a century later, our sights are set on our nearest neighbouring planet Mars. At a minimum distance from Earth of 54.6 million km, and taking into account orbital constellations, a round trip is expected to last at least 21 months, including a 3-month sojourn on Mars' surface; if you think you suffered a long journey to attend this conference – and the inevitable railway or airline food – then consider the crew of astronauts cooped up in a spacecraft for 18 months, with not a supermarket in sight. Indeed one of the biggest challenges faced with such a lengthy mission is sufficient sustenance for the crew. Notwithstanding the enormous costs involved (ca. \$ 10 k to launch 1 kg cargo, e.g. food, into space), one particular challenge is to ensure sufficient calorific and nutritional intake. Data from extensive missions aboard the International Space Station, ISS, indicate that astronauts eat insufficient amounts of food to maintain their body weight; amongst other things it has been posited that altered flavour perception arising from the conditions in space might be a driving factor for this. To address this concern, the European Space Agency, ESA, has commissioned an exploratory project to ascertain the potential influences on extra-terrestrial flavour perception with a view to modulating food rations on space missions to increase dietary intake and thereby assure astronaut nutritional wellbeing. This keynote lecture will present empirical insights into astronaut nutrition and outline the factors potentially influencing flavour perception in space.