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In vitro edible muscle protein production system (mpps): stage 1, fish

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Abstract

The working efficiency and state-of-mind of a Space vehicle crew on long-term missions is dependent on the suitability of living conditions including food. Our purpose was to

establish the feasibility of an *in vitro* muscle protein production system (MPPS) for the fabrication of surrogate muscle protein constructs as food products for Space travelers. In the experimental treatments, we cultivated the adult dorsal abdominal skeletal muscle mass of *Carassius* (Gold fish). An ATCC fish fibroblast cell line was used for tissue engineering investigations. No antibiotics were used during any phase of the research. Our four treatments produced these results: a low contamination rate, self-healing, cell proliferation, a tissue engineered construct of non-homologous co-cultured cells with explants, an increase in tissue size in homologous co-cultures of explants with crude cell mixtures, maintenance of explants in media containing fetal bovine serum substitutes, and harvested explants which resembled fresh fish filets.

We feel that not only have we pointed the way to an innovative, viable means of supplying safe, healthy, nutritious food to Space voyagers on long journeys, but our research also points the way to means of alleviating food supply and safety problems in both the public and private sectors worldwide.

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