

499b Reusable Pouch Development for Long Term Space Mission: Verification of Sterility Efficacy in Terms of Thermal Distribution in 3d and Shelf Life Study of Food Package

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One of the challenges of food system development during a long-duration space mission is the need for reheating of food, processing and stabilization of waste products, including food and biological waste. The pouch developed in this study was intended to be reusable for waste sterilization post food consumption since in doing so, it would significantly minimize the ESM. Our preliminary tests showed that the pouch fabricated with stainless steel electrodes made it feasible to ohmically treat samples selected from the International Space Station (ISS) menu items. Verification of the sterility efficacy of select food item in packaging necessitated 3D temperature measurement to ensure all parts of food materials to be heated to sterilization temperature. Applied numerical modeling in a 3D environment could prove to be an effective tool to study and prevent the worst-case scenario, i.e. cold zone, during food sterilization. The shelf life study of food package to determine whether there is significant migration of electrode components during storage post sterilization is expected to pave the way to selection of innocuous electrode materials.