

Challenges of Life Support/Medical Support for Human Missions (8)
Challenges of Life Support/Medical Support for Human Missions (1) (1)

Author: Prof.Dr. Viacheslav Ilyin

Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation,
piton2004@bk.ru

Mr. Serge Ameye

(*country is not specified*), serge.ameye@marsbakingsociety.space

Dr. Galina Vassilieva

Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation,
galvassilieva@mail.ru

Dr. Valery Novikov

FSC RF-IMBP, Russian Federation, ogavic@mail.ru

Dr. Daria Komissarova

Institute for Biomedical Problems, Russian Federation, sky-smuggler@yandex.ru

Dr. Boris Afonin

Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation,
afonin@imbp.ru

Mrs. Nonna Usanova

Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation,
usanova@imbp.ru

Mrs. Julia Morozova

Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation,
julymorozova@mail.ru

Mr. Kirill Shef

Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation,
schef.kirill@yandex.ru

SYNBIOTIC FOR SPACE TRAVELERS

Abstract

Two of the many concerns Space travelers are confronted with are biodome deficiency and bone decay. The authors have attempted to formulate a food supplement that can contribute to resolve both problems and at the same time could be produced on another planet such as Mars. The basis lays in using a sourdough fit for baking as an active carrier combined with selected microorganisms, enzymes, vitamins and minerals. Hence the definition “Synbiotic” is due to the combination of various probiotics with other health benefiting elements. A first formulation aiming at monitoring the probiotic effect was monitored at the Institute for Biomedical Problems during an 8-month isolation experiment in 2019, whereby a crew of 6 persons were clinically tested. The crew was divided onto 2 equal groups. Control group was given a drink on the basis of *Saccharomyces* spp, enriched with probiotic containing lactobacilli, bifidobacteria and *Enterococcus faecium*. The drink was given daily from 1 to 15th day of isolation. The results reveal absence of usual “pike” of pathogenicity potential” in control group microflora in @acute adaptation period (1-15 isolation days) unlike control group, where we have faced with ordinary growth of conventional pathogens with decrease of “protective” microflora. A second formulation containing other

than probiotics also vitamins, enzymes and minerals was clinically tested in 2020, again at IMBP, with participation of 10 persons (2 men and 8 women) over age 55 during a period of 3 months. We used this model because women of this age frequently suffer from bone loss. Meanwhile bone loss is one of circumstances, space crew members suffer from. Though the period was too short and the sample too limited the conclusions were quite promising, since we saw decrease of conventional pathogens in content of intestinal microflora and have some modest evidences of bone density stabilization. Thus, one of the obvious aims is to use the results of research for the interest of space crews medical care can also be applied on on-Earth medicine: where there is a growing number of persons with biodome related problems and osteoporosis who could be helped in the future.