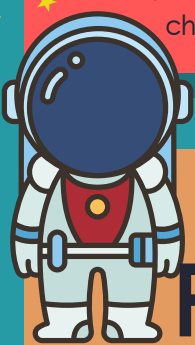


# ANALOG ASTRONAUTS IN THE COVID-19 PANDEMIC



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The Corona Virus Disease 2019 (COVID-19) pushed us to the limits of becoming Analog Astronauts within the confines of our homes. The numerous community quarantine lockdowns mimic the closed environment that astronauts experience on-board the International Space Station (ISS). Three hundred forty (340) respondents from Canada, the Caribbean, Greece, Hong-Kong, India, Italy, Japan, Philippines, Qatar, Singapore, Thailand, and the USA disclosed their dietary adjustments for health and survival. This paper showcases the food consumer landscape variations before and during this historic pandemic. Vital concepts were drawn to summarize data that may serve as a benchmark in ideation proposals on basic life support in the food and supply chain, tailored for future crewed Lunar and Martian missions



## ANALOG ASTRONAUTS

The Human Analog Missions are simulations on earth that allow field tests for low-cost validation of space concepts. The success of the Apollo program relied heavily on analog missions. These are extreme environments comparable to space environment such as desert, volcanic, arctic, lake, ocean and low Earth orbit environments. The pandemic itself ushered the world to the same extreme, uninhabitable environment bringing forth ANALOG ASTRONAUTS.

## PROFILE

- 346 respondents, 340 agreed to continue
- Canada (4), the Caribbean (1), Greece (1), Hong Kong (2), Italy (2), Japan (1), Philippines (308), Qatar (6), Singapore (1), Thailand (4), USA (5), Vanuatu (1)
- Most respondents are adults at 66%, the remaining are youth at 34%
- The Analog Astronauts in this study are predominantly Filipinos @90%
- 10% mixed from several countries
- Sixty percent (60%) of which are female and 40% male



COVID-19

## NUTRITIONAL CHANGES

MEAL PLANNING has shown a significant change between before & during pandemic in increasing time of about 1-3 hours from 0-30 minutes. A similar landscape of DIET in three main meals & two snacks were observed, with a slight increase in lunch and midnight snacks. 38.2% reported more snacking, 32.9% reported skipping meals, while 28.8% showed no change in meal consumption. 46.4% reported an increase in WEIGHT, 23.5% decreased while 30.3% maintained. Of the CRAVINGS, 61% reported healthier options, 31% unhealthy while 59% reported no cravings. SUPPLEMENTATION increased by 25% mostly of multivitamins followed by Vitamin C.

## SEMI-CLOSED FOOD SYSTEM

The pandemic mimicked the semi-closed food system in the International Space Station (ISS) in several points, primarily by the LOSS OF IMMEDIATE ACCESS in food. The regular payload of food rations sent to the ISS can be likened to the bike deliveries, as well as the government subsidized food rations that are SHELF STABLE and STACKABLE in the pantry. One major difference is that the ISS menu are well planned and healthy. The Veggie project of ISS, is similar to the food security measures popularized by the emergence of PLANTITOS & PLANTITAS - stranded individuals at home who found the joy in aesthetic and edible planting.

## DISCUSSION

The 21st Century opens its door to a new dawn of space exploration by sending a comeback to the lunar surface. Apollo's twin sister, Artemis has an ambitious goal - not just another touchdown but a long-term stay. The Artemis tackles an increasingly complex mission to build a long term-human presence on the Moon, that will eventually serve as a base for power and resources in deep space exploration, such as Mars. The semi-closed food system brought about by the extreme conditions of the pandemic resulted to 155% million dollar increase in revenue in food deliveries and is expected to double by 2025. Shelf stable food remains on the top of the list in securing food both in the ISS and in the household level, but careful meal planning will transform this high-sodium laden food into healthier diet once coupled with fresh garden produce. The global gardening sales value from 2019 to 2020 has increased to 104B USD and may increase in 2024 by 130B USD. One striking difference is that in the ISS, astronauts reports loss in weight, but the analog astronauts reported an increase. A closer look at the psychology of eating is also crucial in both scenarios, as well as a baseline data of BMI before and during the pandemic to validate whether the increase or decrease in weight is of a valuable change. Having in mind that nutrition is elementary to health.

## CONCLUSION

The current semi-closed food system of the ISS is a limitation for longer space missions, therefore sustainable approaches must be carefully studied and experimented. This study finds its value in this undertaking, but caveat should be taken as the results of the study describes predominantly Filipinos. Thus variations may occur if a wider scope of respondents that stretches across the globe occurred. Overall, sustained production of food in the ISS will open doors to a variety of selections from the usual dehydrated menus along with an efficient food delivery system, healthy food cravings to ensure psychological support, a well-thought-of meal plan, and active monitoring of nutritional status are parts and parcel of an effective food system, whether on Earth or in Space.

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