The Ultimate Culinary Space Experience

Delivering hedonic pleasure in the form of high performance food for the health and nutrition of an astronaut

By Shahreen Reza
Why are pleasurable food experiences in space even important?

A high-functioning astronaut needs high-performance food to fuel them.

1. According to a report by ESA, astronauts on the International Space Station are not consuming enough calories to meet the daily energy requirement.

2. For deep space missions, such as Mars, there is substantiated concern that a calorie deficit over this period may lead to adverse effects in crew members.

3. Why do astronauts undereat when they have a supply of food designed to fully deliver their nutritional needs?
“Conditions in space change the perceived flavor of the food, and this flavor change may, in turn, lead to underconsumption by astronauts.”

- Professor Andrew Taylor

Flavor is not what is happening in the mouth

Oral referral makes us think it is happening in the mouth, but psychologists and neuroscientists tell us that flavour is a concoction of the brain
Ever drank tomato juice in the air?

It’s not your imagination; tomato juice does taste different on an airplane.
Sensory perception of smell and taste has been known to change in microgravity.
How to define flavour

The Fundamentals about Flavour:

- The only human experience that engages with all the senses.
- There is a dominant role of olfaction (retronasal and orthonasal).
- Importance of audition - there is a modulatory role of sound (e.g., certain sounds affect taste and olfactory perception, noise impairs our ability to taste).
- Expectations anchor the experience, and affect our opinions of what we experience.
- We eat with our eyes. Visual perception, and in particular colour, has a big impact on taste perception, food choice, and value perception.
- Important role of trigeminal stimulation (e.g. pungency, carbonation, certain foods such as wasabi, mustard,...).
- Important role of touch - in mouth, and in hands + body.
- Important role of past experience and memory.
There’s more to flavour

**Powerful memories** can be elicited through smell/flavour

Part of our flavour preferences are **learned** (cultural), others are **genetic** (taster status)
According to JAXA: Living is eating, whether on Earth or in outer space.
The French Perspective

CNES has provided cultural influence on the ISS through food

- A focus on flavour as opposed to function
- Cans over pouches to see the food with our eyes
Food Aesthetics: 

**OLFACTION**

The dominant flavour sense.
It is frequently asserted that somewhere between 75 and 95% of what we commonly think of as taste actually comes from the sense of smell.

Most researchers would appear to agree that olfaction plays a “dominant” role in the tasting of food.
Trigeminal stimulation

SPICY
SOOLING
WARMING
Food Aesthetics: **TEXTURE**

Creating the crunch that astronauts crave while addressing the micronutrient deficiency!
Fundamental roles of basic tastes

**UMAMI:** essence of deliciousness.

The fifth taste, it imparts a savory flavor, or meatiness, creating depth.

Umami highlights the sweetness and saltiness perception, without actually increasing the sodium content.

**There is more to taste:**

**KOKUMI.**

The literal meaning is “rich taste”, it imparts a sense of richness, mouthfulness, and complexity.

In truth, kokumi doesn’t taste like anything...it’s a feeling...that “craveability”
Hedonics

Hedonics is the branch of psychology dealing with pleasant and unpleasant feelings.

Since Aristotle, happiness has been usefully thought of as consisting of at least two aspects: hedonia (pleasure) and eudaimonia (a life well lived).

Moods and emotions influence our food choices, and food choices can, in turn, influence moods and emotions:

*Memories evoked by eating something may have strong links to significant and special moments that people have experienced at some point in their lives. Marcel Proust describes food almost as a vessel for time travel.*
**Astreas NOOSPHERE**

100% RDA of key micronutrients and neuroenhancers

- **Vitamin D3, K2 & C**
  - Strengthens bones and maintains calcium homeostasis

- **Choline**
  - Improves memory & focus

- **Lion’s Mane Mushroom**
  - Stimulates neurogenesis

- **Magnesium Chelate**
  - The highest form of magnesium with 50% more absorption for heart health and brain health, boost in energy

- **Chromium**
  - Improves exercise performance and reduces insulin resistance, this modulates the blood glucose level

- **Vitamins B6 & B12**
  - B vitamins have a direct impact on energy levels, brain function, and cell metabolism
Astreas

Energy Sphere

CDP Choline
Focus & memory

L-Theanine from tea
Provides a sense of “calming” to balance out the stimulation brought on by caffeine

Caffeine
Energy
We don’t talk very much about how to prepare food but that is as big of a challenge as the production.

People who are going to Mars will have free time on their hands.
THANK YOU

www.astreas.co
sreza@astreas.space