A Taste from Mars

Note by Note

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1 Introduction

The concept of "Food for the Future" resonates deeply with the global agenda to achieve the United Nations' Sustainable Development Goals (SDGs). Among these, goals such as SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), and SDG 12 (Responsible Consumption and Production) underline the necessity of creating innovative food solutions to address pressing global challenges, including malnutrition, food insecurity, and environmental degradation.

One of the targets of SDG 2 (Zero Hunger) is to "end all forms of malnutrition….and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons," as evidenced by prevalence of anemia in women aged 15-49 years (UNSD, 2024) . In fact, Anemia is one of the most widespread nutritional issues globally, affecting 40% of all children aged 6–59 months, 37% of pregnant women and 30% of women 15–49 years of age (WHO, 2023) . It is characterized by reduced hemoglobin (Hb) concentration and/or red blood cell (RBC) numbers which become insufficient to meet an individual's physiological needs. Anemia is associated with increased morbidity and mortality in women and children, poor birth outcomes, decreased adult work productivity, and impaired cognitive and behavioral development in children (Wieringa et al., 2016) . Addressing and treating anemia is therefore of critical importance.

While deficiencies in vitamins A, B12, B6, C, D, and E, as well as folate, riboflavin, copper, and zinc play significant roles in the development of anemia however iron deficiency remains the most prevalent cause (Wieringa et al., 2016) . Iron plays an essential role in the production of hemoglobin, the protein in red blood cells responsible for transporting oxygen throughout the body (American Red Cross, 2021) .

As we venture further into the 21st century, modern advancements in planetary science offer unique inspiration for addressing nutritional challenges on Earth. For example, while no food currently exists on planets like Mars, research and experiments conducted by NASA and other institutions suggests that growing food on Mars under controlled conditions could be feasible in the future (Green, 2022) .

Mars, often referred to as the Red Planet, holds a symbolic connection to iron due to its reddish surface, primarily caused by iron oxide. Moreover, the

concept of "Food for the Future" aligns with the broader context of space exploration and the potential colonization of other planets. NASA's recent discoveries regarding Mars' composition, including traces of essential minerals such as Iron and evidence of ancient water flows, emphasize the feasibility of exploring the planet's resources for human sustenance (National Aeronautics and Space Administration (NASA), 2024). These scientific insights inspired the creation of a dish designed to be both nutritionally rich and symbolically linked to Mars' iron-rich surface.

The dish is crafted to address anemia by incorporating iron alongside complementary nutrients such as vitamins C and A. From a design perspective, it resembles the planet Mars, reflecting its colors, shape, and internal structure. When sliced, the dish reveals layers that represent the planet's core, mantle, and crust, offering an educational and sensory experience.

The sensory foundation of the dish is inspired by the metallic taste and smell associated with iron oxide on Mars, which is particularly emphasized in the mantle layer to connect the palate to the planet's defining features. Furthermore, the crust layer incorporates vitamin C, which plays a role in enhancing iron bioavailability by aiding its absorption (Zamwar et al., 2023). Vitamin C is believed to increase gastrointestinal acidity, promoting the conversion of non-absorbable ferric iron (Fe^{3+}) into its more absorbable ferrous form (Fe^{2+}), thereby improving overall iron uptake (Deng et al., 2023). The core, on the other hand, is enriched with vitamin A, a nutrient critical for iron mobilization and utilization. Vitamin A facilitates the redistribution of stored iron to the bone marrow, where it supports the production of hemoglobin and red blood cells. Additionally, retinoids, derivatives of vitamin A, are known to directly stimulate erythropoiesis (the production of red blood cells) and influence the synthesis of erythropoietin (EPO), a hormone essential for red blood cell development (B Zimmermann et al., 2006).

In addition to planetary inspiration and nutritional benefits, the dish uses molecular gastronomy. Molecular gastronomy explores the physical and chemical processes that occur during food preparation, enabling a deeper understanding of ingredients at the molecular level (Lavelle et al., 2021). This scientific approach has revolutionized cooking methods, introducing techniques such as note-by-note cooking. Developed by This (2014), note-by-note cooking involves constructing dishes using pure chemical compounds rather than traditional ingredients, allowing for precise control over flavor,

texture, and nutritional content. This method allows precise control over flavor, texture, and nutritional composition, enabling the creation of innovative and sustainable culinary experiences.

By applying note-by-note techniques, I created a dish that reflects the Martian aesthetic while ensuring a good balance of nutrients, minimizing waste and optimizing resource use. The inspiration for the dish's flavor profile emerged from a Mango, Raspberry, and Passion Fruit Mille-Feuille I had tried on my first day here. It was my first time trying this unique combination of flavors, and I was captivated by their harmonious blend.

The dish features a raspberry gel crust that mirrors the appearance of Mars' surface, a passion fruit cream mantle, and a mango ice cream core. To enhance the visual appeal, the dish is adorned with mango rocks and sauce as well as additional passion fruit cream for decoration.

2 Aim of the assignment

To create a dish that bridges the gap between science fiction and sustainability by envisioning food inspired by planetary characteristics, using note-by-note cooking techniques to craft a composition rich in iron, vitamin C, and vitamin A, aimed at addressing anemia.

3 Final materials and methods

Pictures of all ingredients and equipment used are available in Appendix B and Appendix C. This recipe yields 3 dishes of "A Taste from Mars."

3.1 Mango rocks:

Ingredients:

- 100 ml water
- 1.5 g agar-agar (by "Sosa")
- 0.15 g sucralose powder (sucralose sugar-free sweetener by "My Protein")
- 3 g mango flavor powder (by "Sosa")
- 0.06 g orange food color (2 drops of orange liquid coloring by: "Mallard Ferriere")

Equipment:

- Saucepan
- Whisk

Method:

1. In a saucepan, mix agar-agar, mango flavor with water, dissolve the sucralose, and heat to dissolve the agar-agar.
2. Take off the heat and pour into a small plate with high edges.
3. Set aside 50 g of the mixture to use for creating the sauce later.
4. Add orange color randomly to the remaining mixture in the plate and create a swirling motion with a knife to create a "rock-like" effect.
5. Set it in the fridge and let it cool down.
6. Once solid, cut into small cubes and remove carefully from the plate.
7. Cut the edges of the cubes to give them a natural, rock-like appearance.

3.2 Underneath Sauce

Ingredients:

- 0.06 g green color (2 drops of mint green liquid coloring by "Mallard Ferriere")
- 50 g rocks (instructions are above)
- 15 ml water

Equipment:

- Hand blender
- Metal circle cookie cutter (10 cm)

Method:

1. Before the rocks gel cools completely, add the green color and cut it into cubes.
2. Place the cubes in a bowl with a small amount of water and blend using a hand blender until smooth.
3. Place a circular cookie cutter in the center of the presentation dish. Pour the smooth gel into the cutter and spread it evenly to form a circular base for the planet to sit on.

3.3 Planet

3.3.1 Raspberry crust:

- Brown gel color (by Il Punto Italiana")
- 400 ml water

- 6 g agar-agar (by "Sosa")
- 0.5 g sucralose (sucralose sugar-free sweetener by "My Protein")
- 0.09 g natural raspberry flavor (3 drops gerd frambules by "Sosa")
- 30 g collagen and vitamin C powder (by "Bulk")
- 0.09 g orange food color (3 drops of orange liquid coloring by "Mallard Ferriere")
- 0.03 g green food color (1 drop of mint green liquid coloring by " Mallard Ferriere")

Equipment:

- Saucepan
- Whisk
- Half sphere chocolate mould (6 cavity half spheres with 7 cm diameter and 3.5 cm height)

Method:

1. Prepare the half sphere moulds by wearing gloves and making circles with the brown food color in the moulds to give it that planet looking effect.
2. In a small saucepan, combine the water and agar-agar. Put it on the stove and bring it to a boil while stirring constantly to dissolve the agar-agar completely.
3. Once the agar-agar is dissolved, add the raspberries flavor, sucralose, and green and orange colors and stir well.
4. Take off heat and let it cool for a bit, but without solidifying then add the collagen and vitamin c powder and mix very well until it dissolves.
5. Pour the mixture into moulds and refrigerate.

3.3.2 Passion fruit mantle:

Ingredients:

Beverage:

- 100 ml water
- 1.5 g agar-agar (by "Sosa")
- 4 g table sugar
- 0.48 g passion fruit flavor (16 drops by "Sosa")

Base:

- 35 g powdered egg whites gallia (by "Luis Francois")
- 80 ml water

- 3 iron K-pure capsules (by "Bulk")
- 0.12 g orange gel color (by "Il Punto Italiana")

Equipment:

- Stand mixer
- Saucepan
- Whisk

Method:

1. Place the bowl of the standing mixer into the fridge until it becomes cold.
2. Once cold, blend the protein and water mixture using a stand mixer on medium to high speed until stiff peaks form. Place a cold plate or ice underneath to keep the mixture cool.
3. While the protein mixture is being whipped, prepare the beverage: combine water and agar-agar in a small saucepan. Place it on the stove and bring it to a boil, stirring constantly to ensure the agar-agar dissolves completely.
4. Once the agar-agar is fully dissolved, remove the saucepan from the heat, add the passionfruit flavor, and stir well.
5. Allow the mixture to cool slightly but ensure it does not solidify.
6. Slowly add the beverage to the protein mixture, mixing gently until fully incorporated.
7. Open the iron capsules and add the contents to the mixture. Mix in the orange color to achieve a smooth, whipped cream-like texture.
8. Store in the fridge until later.

3.3.3 Mango core

Ingredients:

- 100 ml water
- 0.11 g sucralose (sucralose sugar-free sweetener by "My Protein")
- 3.5 g mango flavor powder (by "Sosa")
- 0.06 g vitamin A (2 drops of vitamin A drops 5000 IU by "Vitamze")
- 0.5 g lecithin powder (lecite by "Texturas Albert & Ferran Adrià")
- 0.03 g yellow color (lemon yellow liquid coloring by: "Mallard Ferriere")
- 1 g xanthan gum (by "Craic Foods")
- 7 g coconut oil (organic coconut oil by "KTC")
- 6 g corn starch (by Knorr Kingford's)

Equipment:

- Saucepan
- Whisk
- Hand blender
- Half sphere chocolate mould (32 cavity half spheres with 2.6 cm diameter and 1.3 cm height)

Method:

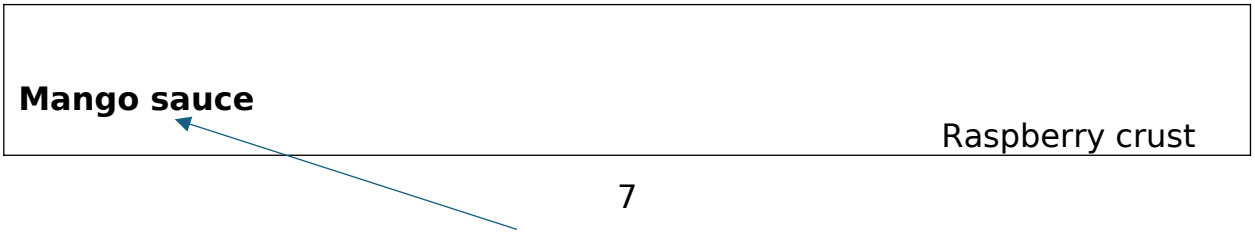
1. In a saucepan, combine 450 ml of water, sucralose, mango powder, yellow color, xanthan gum, and coconut oil. Heat the mixture on low while whisking continuously until all ingredients are incorporated.
2. In a separate small container, mix 50 ml of water with cornstarch until fully dissolved. Then while still heating introduce this mixture into the saucepan while whisking to ensure a smooth and even consistency.
3. Remove the saucepan from the heat and add lecithin and vitamin A oil drops. Blend the mixture thoroughly with a hand blender to achieve a uniform texture.
4. Pour the mixture into small half-sphere molds and freeze until set.

3.4 Assembly of the dish:

1. On the plate where the sauce has already been placed, arrange the rocks as desired. Use some of the mantle whipped cream to decorate the plate.
2. Gently remove the inner part of the crust using a slightly heated spoon, making sure not to cut the crust while doing so, and fill the hollow space with the mantle mousse.
3. Position the core in the center of the mantle mousse.
4. Place the two filled crust spheres on top of each other to form a ball, then position the ball on the sauce.
5. The dish can be enjoyed by using the crust as a plate—scoop out the filling and then eat the crust itself.

4 Results

4.1 Overall dish:



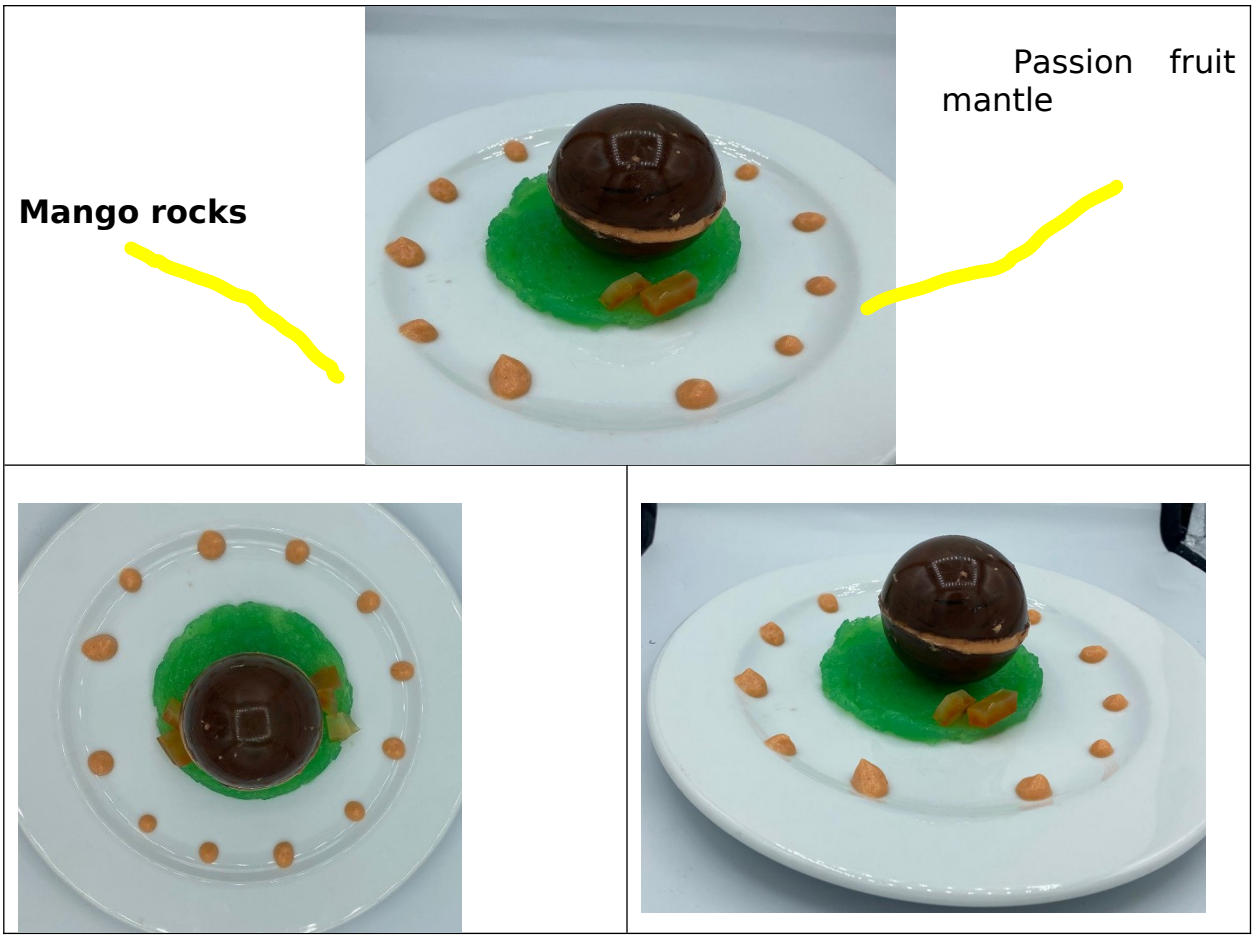


Figure 4.1: "A Taste from Mars" Dish Combining All the Elements

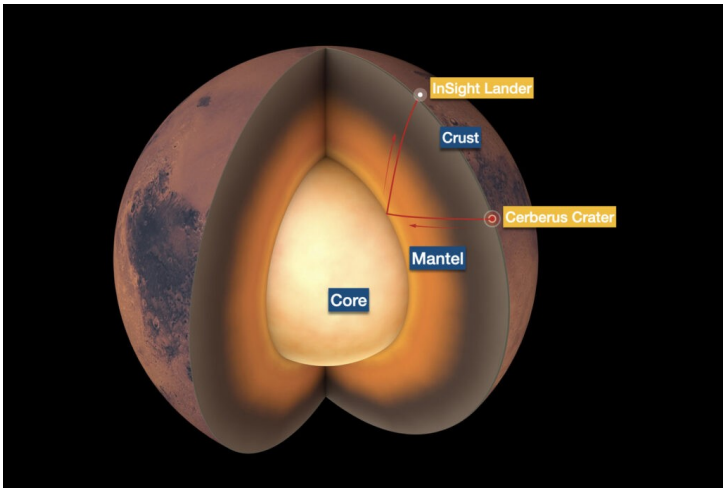


Figure 4.2: Mars' Interior in Layers (Castro, 2021)

Figure 4.1 presents the dish, "A Taste from Mars," showcasing the planet Mars resting on top of the mango gel sauce with the mango rocks. The

planet consists of different three layers , the outer layer (crust) is raspberry flavored, the middle layer (mantle) has passion fruit flavor, and the inner layer (core) features a mango flavor. Additionally, the mantle whipped cream is used for decoration of the plate.

While it may seem like the mango flavor is dominant in this dish, introducing additional flavors would have risked overwhelming the balance. Ultimately the chosen flavors create a harmonious blend of acidity, sweetness, and complexity.

The mantle cream is visible in Figure 4.1, even though the sphere appears closed, due to the weight of the ice cream core moving downward, pushing the light mantle more toward the sides. Although this caused the mantle to be visible, it served a practical purpose by helping bind the half-spheres together, as the gel crust itself could not adhere to another gel layer.

Unfortunately, a photograph of the internal layers of the dish is unavailable due to accidental deletion, but the alignment of the layers should resemble the representation shown in Figure 4.2, which presents the layered structure of Planet Mars.

4.2 Mango rocks and sauce:

The mango rocks were prepared using a gelling technique with agar-agar, producing a firm texture similar to natural rocks. They had a sweet mango flavor and a subtle aroma that wasn't very noticeable.

The mango sauce, created from the same base mixture as the rocks, was adjusted with added water and blending, resulting in a smooth gel interspersed with small lumps. Unlike the orange-yellow rocks, the sauce was green, providing a striking visual contrast on the plate. It shared the sweet mango flavor and mild aroma of the rocks, offering a slightly lighter, less structured consistency.

4.3 Raspberry crust:

The raspberry crust was colored brown to replicate the appearance of Mars' surface. The addition of collagen and vitamin C powder introduced a little acidity, lowering its pH and balancing the sweetness of the flavor profile. It was also prepared using agar-agar to ensure a firm, stable structure that could support the other elements of the dish without breaking. It had a moderate thickness—neither too thin nor too thick— with a mild aroma that was pleasant without being overpowering.

4.4 Passion fruit mantel:

The passion fruit mantle had a light, airy texture similar to fluffy soap bubbles, with a sweet, tangy passion fruit flavor. The key ingredients used to create it were powdered egg white and iron. Fortunately, the usual strong metallic taste of the iron was not perceptible in the dish at all.

During preparation, the powdered egg white, when mixed with water, formed a meringue base. As the semi-gel was incorporated, the texture transitioned into a foam-like consistency. The result was a delicate, foamy mantle with a smooth, airy texture and a vibrant, light orange hue, which complemented the overall dish beautifully.

4.5 Mango Core:

The final element of the planet is the yellow mango core, which had an ice cream-like texture, achieved using xanthan gum and corn starch as thickeners. The recipe for the ice cream was prepared according to (Abensour, 2024), who suggested increasing the fat content to enhance creaminess and reduce excess water in the mixture. This recommendation was incorporated to improve the texture of the ice cream. The core was enriched with vitamin A, and emulsification was used to evenly distribute the vitamin, ensuring a smooth and homogenous mixture.

4.6 Sensory analysis:

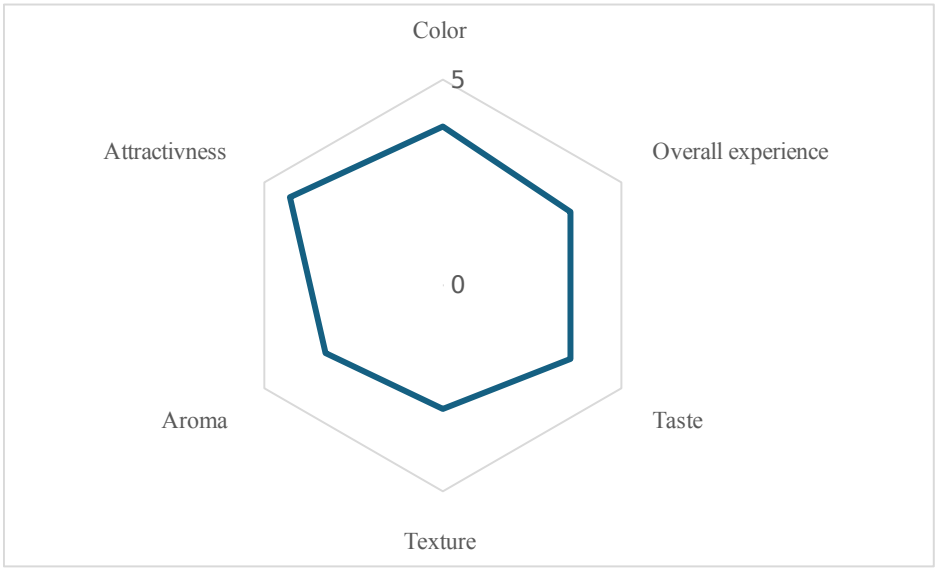


Figure 4.3: Sensory Analysis Spider Chart

Figure 4.3 represents the sensory analysis of "A Taste from Mars", with the following attributes assessed: color, attractiveness, aroma, texture, taste,

and overall experience. These attributes were chosen to capture a comprehensive evaluation of the sensory qualities that contribute to the dish's appeal and overall perception. A sensory evaluation form (see Appendix D) was distributed among 7 food product development students; thus, these results are based on their feedback. The scores range from 1 (dislike very much) to 5 (like very much).

Color scored 3.9 which is excellent. The dish includes a fusion of colors beginning with a glossy, dark brown outer layer that gleams under the light. Inside, a soft, light orange middle layer made of whipped cream. At the core lies a lemon-yellow layer of creamy mango ice cream, offering a luscious and indulgent tropical finish. The dessert's colors representing planet Mars make it visually appealing which is why it scored 4.3 in attractiveness.

The aroma received a rating of 3.3, suggesting that the product's smell was neither particularly inviting nor discouraging. Notably, the aroma was described as very light.

Texture scored 3, the lowest of all attributes, reflecting a moderate level of satisfaction. While participants did not provide specific comments regarding texture, this score suggests that the product requires adjustments to enhance its texture, making it more satisfying and complex.

The taste of the dish and overall experience both received a score of 3.6, indicating that the product was perceived as pleasant by the majority of participants. However, minor adjustments are necessary to better meet consumer expectations.

4.7 Nutritional analysis:

All ingredients were inserted with their nutritional value into Nutritics and a nutritional analysis was obtained for the whole dish (see Appendix E). The recipe yields 3 dishes with each dish approximately 420 g.

Table 4.1: Macronutrient Analysis for 100g and 264g Serving Sizes

Nutrient	**Per 100g**	**%RI (Per 100g)**	**Per 264g Serving**	**%RI (Per Serving)**
Energy (kJ)	209 kJ	2%	553 kJ	7%
Energy (kcal)	50 kcal	3%	131 kcal	7%
Fat	1 g	1%	2.5 g	4%
of which	0.8 g	4%	2 g	10%

saturates				
Carbohydrate	2.6 g	1%	6.8 g	3%
of which sugars	0.9 g	1%	2.4 g	3%
Fibre	2 g	8%	5.3 g	21%
Protein	6.7 g	13%	18 g	36%
Salt	0.21 g	4%	0.55 g	9%

Table 4.1 summarizes the macro nutritional content clearly for both per 100g and per 264g serving sizes, including percentage reference intakes (%RI). For a standard 264g serving, the energy content is 131 kcal, representing 7% of the RI.

The fat content per 100g was recorded at 1g, contributing 1% of the RI, while the serving size contained 2.5 g of fat, meeting 4% of the RI. The dish is considered low in fat as it is less than 3 g per 100g. Although saturated fat contributes a significant proportion of total fat, measured at 2 g (10% RI), the dish is still considered low in saturated fat.

Carbohydrates were present at 6.8 g per serving (3% RI), with sugars forming a minor component at 0.9 g per 100g (1% RI) and 2.4 g per serving (3% RI). This also makes it low in sugar as it contains no more than 5g of sugar per 100g. Fiber content was measured at 5.3 g (21% RI) in a single serving, reflecting its role in dietary fiber contribution.

The product exhibited a protein content of 18 g, fulfilling 36% of the RI, which makes the dish high in protein as at least 20% of the energy value of the food is provided by protein. Finally, salt content was recorded at 0.21 g (4% RI) per 100g and 0.55 g (9% RI) per serving, indicating low salt levels.

Table 4.2: Micronutrient Analysis for 100g and 264g Serving Sizes

Micronutrient	**Per 100g**	**%RI per 100g**	**Per 264g Serving**	**%RI per 264g**
Iron	1.9 mg	14%	5.02 mg	37%
Vitamin A	129 mcg	16%	340.6 mcg	42%

Vitamin C	6.1 mg	8%	16.1 mg	21%

Table 4.2 highlights the 3 main micronutrients in "A Taste from Mars". While Iron is the primary nutrient in the dish, its levels are relatively low, and therefore no health claim can be made regarding its contribution. Similarly, vitamin C levels are also considered low. However, with a content of 129 mcg, surpassing the threshold of 120 mcg, the dish qualifies as a source of vitamin A.

In conclusion, "A Taste from Mars" can be claimed to be low in fat, saturated fat, sugar, and salt, while being high in protein and a source of vitamin A, in accordance with the guidelines of the (FSAI, 2021) .

4.8 Environmental Impact Summary:

Figure 4.4: Environmental Impact Summary for "A Taste from Mars"

Figure 4.4 created by Nutritics presents the environmental impact assessment of "A Taste from Mars" in terms of carbon emissions and water usage per serving. The figure uses a color-coded rating scale (A to E) to evaluate the carbon footprint, with "A" denoting a very low impact. The carbon dioxide equivalent (CO_2eq) emissions are quantified at 0.18 kg per serving, placing the product within the lowest impact category. Additionally, water consumption is at 11.9 liters per serving indicating minimal water use.

This environmental assessment suggests that "A Taste from Mars" is environmentally sustainable, with particularly low carbon emissions and water footprint.

3 Discussion

5.1 Flavors and processes

The flavors chosen—raspberry, passion fruit, and mango—are popular combinations, as evidenced by their frequent use in recipes such as yogurt layers, trifles, cakes, and slushes. Raspberry offers a bright, tangy sweetness with subtle floral notes, the passion fruit contributes citrusy sharpness, and the mango adds tropical richness. Together, they form a vibrant and refreshing flavor profile that enhances the overall dish. Notably, the quantities of raspberry and passion fruit flavorings used were 0.09 g and 0.48 g. This difference is because the raspberry flavoring was natural and thus more concentrated, while the passion fruit flavoring was less concentrated. This distinction is supported by the dosage guidelines provided on the manufacturer's website (Sosa, 2024b; c) .

The cooking process utilized several key techniques, including the preparation of the raspberry crust using agar-agar as a gelling agent. Agar-agar, a gelatinous substance derived from algae, is composed of a mixture of agarose and agaropectin (Sudha et al., 2014). As a hydrocolloid, agar-agar binds with water to form thermoreversible gels, which melt upon heating and solidify upon cooling. When added to the liquid mixture, agar-agar facilitated gel formation. Gels form occurs as hot hydrocolloid dispersions cool and set. During this setting process, the mixture separates into small, polymer-rich particles, leaving polymer-poor regions in between (Banerjee and Bhattacharya, 2012) .

The gelling ability of agar-agar is influenced by the pH of the ingredients it is combined with. Acidic foods, such as citrus fruits or those containing vitamin C, may require higher amounts of agar-agar to achieve proper gelling. The recommended ratio is 1.3 g of agar-agar per 100 ml of acidic liquid (Madalene, 2024); however, in this recipe, 1.5 g was used for every 100 ml of liquid, regardless of its acidity.

The passion fruit mantle was created using a whipping technique based on Hervé's video demonstration (BU- Metropolitan College, 2014) demonstration, which originally used whey protein. However, since whey protein was unavailable, powdered egg whites were chosen as a substitute due to their proven effectiveness in meringue preparation. The cooking process involved a whipping technique combining water and egg white powder, which introduced air into the mixture. Initially, this base was slightly stiff and sticky before transitioning to a light and airy texture with the incorporation of the semi-gel.

Whipped cream is an example of an air-in-water foam where air bubbles are stabilized by a protein film containing dispersed fat droplets. During whipping, partial denaturation of the proteins occurs, along with clumping and partial solidification of fat globules, which stabilize the

foam structure and prevent collapse (Deosarkar et al., 2016) . To enhance stability, the bowl of the stand mixer was chilled prior to whipping. Cooling is essential during foam formation as it helps stabilize air bubbles, contributing to a light and airy texture.

Despite these measures, the final whipped mixture exhibited a soapy creamy texture. This could be attributed to the semi-gelled agar mixture, which is less fluid and more difficult to incorporate evenly. As a result, it may have created uneven air pockets resembling soap bubbles. Furthermore, the semi-gelled state likely required more vigorous mixing to blend, introducing additional shear forces that destabilized the foam structure. This destabilization could have resulted in a less stable mixture with large, irregular air bubbles (Green et al., 2013).

Additionally, the spoon used during assembeling of the dish to remove the inner part of the crust was heated, to facilitate the process as gel is thermoreversible so by applying heat from the spoon it was easier to cut through.

The ice cream core had a creamy texture due to the incorporation of xanthan gum and corn starch, both of which functioned as thickeners. Xanthan gum, widely used in food emulsions, is particularly effective at increasing the viscosity of the aqueous continuous phase, even at low concentrations. This property makes it a common choice for stabilizing dispersed oil droplets (Traynor, Burke and Frias, 2013).

In addition to these thickeners, vitamin A drops were added into the core, with lecithin used as an emulsifier to ensure proper integration. Emulsifiers, such as lecithin, work by possessing both a hydrophilic (water-attracting) end and a hydrophobic (fat-attracting) end. This dual affinity allows the emulsifier molecules to bind water and fat together. When the emulsifier is vigorously mixed with the ice cream base and vitamin A, it facilitates the formation of a stable emulsion (Institute of Food Science and Technology, 2024).

During the assembly process, a heated spoon was used to remove the inner portion of the crust. Since the crust is thermoreversible, meaning it softens with the application of heat, it became easier to cut through and shape the gel without compromising the overall structure.

5.2 Discussion of sensory evaluation:

The sensory evaluation of the dish, conducted among revealed a generally positive reception with room for refinement. While the color scored highly at 3.9, the aroma received a comparatively lower rating of 3.3. This score suggests that the dish's aroma, although pleasant, lacked intensity. Participants described it as very light, which can be attributed to the fact that it is a cold dish.

Heat increases the volatility of aroma compounds in food, causing more molecules to evaporate into the air. These molecules travel faster and farther, making the smell of hot food more noticeable and widely dispersed. In contrast, cold food releases fewer volatile compounds due to lower temperatures, resulting in a less intense and more localized aroma (Chen et a

. A way to enhance the aromatic profile of the dish would be by spraying it with additional natural extracts.

The texture received the lowest score of 3.0, reflecting moderate satisfaction among the participants. Although the dish featured a variety of textures, the overall experience suggests a need for greater cohesion and complexity. Instead of using the same mango rocks made through agar-agar and blending them, which results in a rather lumpy sauce, the texture could be refined. The sauce could be improved using Ultratex (by MSK) combined with mango juice, mango-flavored water, or any other flavor used in the dish to create a smoother, shinier, and more saucy texture.

Taste and overall experience both achieved scores of 3.6. Adjustments to the balance of flavor intensity could further elevate the dish's taste. An increase in the mango flavor powder amount could be considered, as the quantity added in the rocks and core was less than the recommended levels of 70g per kg of gel and 100g per kg of ice cream (Sosa, 2024c). This reduction was a cautious decision, as there were concerns that the recommended amount might overpower the dish. However, a slight increase could enhance the flavor without compromising its balance.

5.3 Discussion of the nutritional analysis:

The nutritional analysis of "A Taste from Mars" demonstrates that it aligns well with current dietary guidelines, positioning it as a health-conscious product. The high protein content is particularly notable, with 18 g per serving, fulfilling 36% of the RI. The powdered egg whites are the primary protein source, offering a high-quality, easily digestible protein that supports muscle maintenance, wound healing, and production of hormones and enzymes (Berkshire Healthcare, 2020). This makes the dish a suitable option for individuals aiming to increase their dietary protein intake.

The product also provides a meaningful contribution to dietary fiber, with 5.3 g per serving (21% RI). This fiber content is largely attributed to the agar-agar, a hydrocolloid that not only thickens and stabilizes the dish but also provides soluble fiber. This enhances the dish's nutritional appeal by supporting digestive health and increasing satiety (Clegg and Shafat, 2014).

Regarding micronutrients, "A Taste from Mars" contains iron, vitamin C, and vitamin A, though only vitamin A levels are sufficient to support health claims. The dish qualifies as a source of vitamin A, providing 129 mcg per serving, exceeding the threshold of 120 mcg. This contribution not only supports absorption of iron but also supports vision and immune health. The iron and vitamin C present in the dish are less concentrated but still add value to the nutritional profile.

Although the use of isolated ingredients was intended to create a dish high in iron, vitamin C, and vitamin A, the final product did not meet the criteria to be classified as high in these nutrients. This discrepancy arose because the nutrient content was calculated based solely on the

weight of individual components rather than the total weight of the dish. To meet the criteria, it is recommended that nutrient calculations be based on the entire weight of the finished dish.

The inclusion of raspberry, passion fruit, and mango flavors highlighted the nutrients they are commonly associated with. Raspberries, for example, are naturally high in vitamin C (26.2 mg), mangos are a rich source of vitamin A (54 mcg), and passion fruit contains 1.6 g of iron (USDA, 2019a;b;c). While these nutrients are not directly present in the dish, the association with these fruits enhances its sensory, planetary and nutritional appeal.

All colors, nutrients, and flavors included in "A Taste from Mars" comply with safety regulations established by the (EU Regulation (EC) No 1333/2008;). The quantities of added flavors, nutrients, and colors were carefully controlled and used within the safe limits outlined in the manufacturers' instructions.

5.4 Discussion of the environmental impact summary:

The environmental assessment of "A Taste from Mars", presented in Figure 4.4, highlights its strong sustainability credentials. Additionally, the note-by-note cooking approach employed in this dish offers further sustainability benefits. By focusing on isolated ingredients and precise formulations, this method reduces food waste, optimizes resource use, and allows for greater control over flavor, texture, and nutritional content.

4 Conclusion

In summary, "A Taste from Mars" demonstrates an integration of futuristic vision, nutrition, and sustainability. The dish meets key dietary guidelines by being low in fat, sugar, and salt, while providing a significant source of protein and vitamin A. By utilizing molecular gastronomy techniques like note-by-note cooking, the dish offers precise nutritional benefits, including iron, vitamin A, and vitamin C, while symbolically connecting to Mars' iron-rich surface and vibrant aesthetic. This culinary dish not only highlights the potential of science-driven food design but also emphasizes sustainable and health-conscious solutions to address nutritional deficiencies, aligning with the Sustainable Development Goal of alleviating anemia.

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6 Appendices

8.1 Appendix A: Logbook

8.1.1 Week 1:

Aim: Create all parts of dish to see what works and what doesn’t.

Tomato rocks:

Ingredients:

- 120 ml water
- 2.5 g agar-agar (by "Sosa")
- 7 g tomato powder flavor (by "Sosa")
- 0.5 g citric acid (citric acid monohydrated E-330 by "Louis Francois")
- 0.25 g salt

Method:

1. In a small saucepan, combine the tomato powder, citric acid and salt and mix them in water.
2. Add the agar- agar in the saucepan and bring it to a boil while stirring constantly to dissolve the agar-agar completely.
3. Take off the heat and pour into a small plate with high edges.
4. Set it in the fridge and let it cool down.
5. Once it is solid, cut it into small cubes and remove from the plate.
6. Store away 60g of the rocks for creating the sauce.
7. Cut the edges of the rest to make them look like rocks.

Underneath Sauce

Ingredients:

- 0.2 g blue color (Blue Indigo liquid coloring by "Mallard Ferriere")
- 60 g rocks (above)

Method:

1. Place the rocks into a blender with 0.2g of blue color and blend until smooth.

Olive oil soil:

Ingredients

- 20 g olive oil (extra virgin olive oil by "Castillo de Canena")
- 10 g tapioca maltodextrin (abzorbit by "MSK")
- 1 g salt
- 0.2g Brown Color

Method:

1. Whisk the olive oil, salt and tapioca maltodextrin together in a bowl until it converts to powder.

Planet

Lemon crust:

- Brown gel color (by: ll Punto Italiana")
- 360 ml water
- 7.5 g agar-agar (by "Sosa")

- 2.5 g lemon flavor (by "Sosa")
- 0.5 g garlic powder (by "IMCO")
- 0.75 g ground black pepper (by "Verstegen")
- 1 g ascorbic acid (acide ascorbique poudre E300 by "India France"

Method:

1. Prepare the half sphere molds by wearing gloves and making circles with the brown food color in the molds to give it that planet looking effect.
2. In a small saucepan, combine the garlic powder, ascorbic acid and salt, pepper and mix them in water.
3. Add the agar- agar in the saucepan and bring it to a boil while stirring constantly to dissolve the agar-agar completely.
4. Once the agar-agar is dissolved, add the lemon flavor and stir well.
5. Take off the heat and pour into half sphere molds.
6. Set it in the fridge and let it cool down.

Chicken mantle:

Ingredients:

- 20 g chicken protein powder (by "Protermars")
- 14 g chicken stock (by "Knorr")
- 500 ml water
- 3 g agar-agar (by "Sosa")
- 0.5 g xanthan gum (by "Craic Foods")
- 0.5 g lecithin powder (Lecite by "Texturas Albert & Ferran Adrià")
- 0.5 g salt
- 1.5 g savory flavor enhancer (by "MSK")
- 15 mg iron (3 iron K-pure capsules by "Bulk")
- 0.2 g orange gel color (by "Il Punto Italiana")

Method:

8. Dissolve the chicken stock in water in a sauce pan on low heat, then add the chicken protein stirring until smooth.
9. Sprinkle xanthan gum over the protein mixture and whisk to dissolve. Then add the agar into the mixture and heat it to a boil.
10. After it boils, take it off the heat and add the savory flavor enhancer for an extra “meaty” taste, and season with salt.
11. Mix in the lecithin and iron before adding the orange color.
12. Pour the mixture into half sphere molds and refrigerate.

Potato core:

Ingredients:

- 50 g Potato starch (by "Family Elephant")
- 185 ml Water
- 10 g soya protein (soya protein isolate by "Bulk")
- 0.5 g salt
- 0.5 g ground black pepper (by "Verstegen")
- 0.5 g savory flavor enhancer (by "MSK")
- 0.15 g yellow color (Lemon yellow liquid coloring by: "Mallard Ferriere")

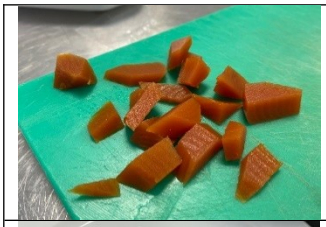
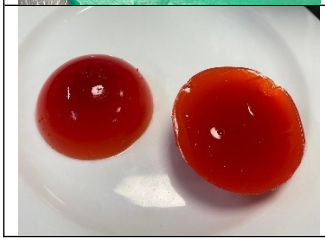
Method:

6. In a saucepan, whisk the potato starch into the water until dissolved and smooth.
7. Slowly heat the mixture, stirring consistently to avoid clumping.
8. Once the mixture thickens, using a hand blender stir in the soya protein powder, salt, pepper, flavor enhancer and yellow color .

Assembly of the dish:

4 Place the soil in a circle near the edges of the plate.
5 Place rocks randomly in the plate.
6 In the middle of the plate place the sauce.
7 Remove the inner part of the crust.
8 Fill the crust with the mantle then the core.
9 Put the two spheres on top of each other to create a ball and place that ball on the sauce.

Pictures:

	Rocks
	Crust

	Mantle
	Core
There are no pictures of the sauce or soil as they were not made due to lack of time.	Underneath sauce and soil

What worked, what didn't work and why?

These components were prepared on different days due to time constraints.

The rocks and rocks had a good taste, texture, and overall appearance. However, the mantel was unsuccessful, leading to a poor structure and unpleasant aroma, which made it inedible. The mixture, which was supposed to solidify slightly and resemble a mousse, instead turned into a thick, creamy liquid. This failure could be due to incorrect ratios or errors in the preparation process. For instance, agar-agar requires precise heating and cooling to gel effectively, and if these steps were not followed, it would fail to solidify. Additionally, xanthan gum must be evenly dispersed in the liquid phase to thicken properly, and the lecithin might not have been adequately incorporated to stabilize air bubbles.

The core was ultimately discarded after being left unrefrigerated, resulting in mold growth, a bad smell, and an unpleasant texture. Its sticky and stretchy consistency made it inedible and far from the intended mashed potato-like texture. Furthermore, the unusual texture suggests an overuse of potato starch, or improper mixing, which may have created a rubbery or sticky product instead of a fluffy consistency.

Finally, no artificial coloring was added to most components except the crust. The core retained a natural yellowish potato color, but the crust appeared very red instead of brown.

What to do next week?

Remake all parts of the dish except for the rocks. And replace ascorbic acid in crust with lemon juice.

8.8.2 Week 2:

Aim: Improve and create all parts and arrange them into a dish to see what they look like.

Tomato rocks:

Ingredients:

- 120 ml water
- 2.5 g agar-agar (by "Sosa")
- 7 g tomato powder flavor (by "Sosa")
- 0.5 g citric acid (citric acid monohydrated E-330 by "Louis Francois")
- 0.25 g salt

Method:

1. In a small saucepan, combine the tomato powder, citric acid and salt and mix them in water.
2. Add the agar- agar in the saucepan and bring it to a boil while stirring constantly to dissolve the agar-agar completely.
3. Take off the heat and pour into a small plate with high edges.
4. Set it in the fridge and let it cool down.
5. Once it is solid, cut it into small cubes and remove from the plate.
6. Store away 60g of the rocks for creating the sauce.
7. Cut the edges of the rest to make them look like rocks.

Underneath Sauce

Ingredients:

- 0.2 g blue color (Blue Indigo liquid coloring by "Mallard Ferriere")
- 60 g rocks (above)

Method:

Place the rocks into a blender with 0.2g of blue color and blend until smooth.

Olive oil soil:

Ingredients:

- 20 g olive oil (extra virgin olive oil by "Castillo de Canena")
- 10 g tapioca maltodextrin (abzorbit by "MSK")
- 1 g salt
- 0.2g Brown Color

Method:

Whisk the olive oil, salt and tapioca maltodextrin together in a bowl until it converts to powder.

Planet

Lemon crust:

- Brown gel color (by: Il Punto Italiana")
- 120 ml water
- 5 g agar-agar (by "Sosa")
- 120 ml lemon juice (by "Tesco")
- 1 g ascorbic acid (acide ascorbique poudre E300 by "India France"

Method:

1. Prepare the half sphere molds by wearing gloves and making circles with the brown food color in the molds to give it that planet looking effect.
2. In a small saucepan, combine the ascorbic acid, lemon juice and mix them in water.
3. Add the agar- agar in the saucepan and bring it to a boil while stirring constantly to dissolve the agar-agar completely.
4. Take off the heat and pour into half sphere molds.
5. Set it in the fridge and let it cool down.

Chicken mantle:

Ingredients:

- 20 g chicken protein powder (by "Protermars")
- 7 g chicken stock (by "Knorr")
- 270 ml water
- 5 g agar-agar (by "Sosa")
- 0.5 g salt

- 0.5 g oregano (by "Schwartz")
- 15 mg iron (3 iron K-pure capsules by "Bulk")
- 0.2 g orange gel color (by "Il Punto Italiana")

Method:

13. Dissolve the chicken stock in water in a saucepan on low heat, then add the chicken protein stirring until smooth.
14. Add the agar into the mixture and heat it to a boil.
15. After it boils, take it off the heat and season with oregano and salt.
16. Mix in the iron before adding the orange color.
17. Pour the mixture into half sphere molds and refrigerate.

Potato core trail 1:

Ingredients:

- 30 g potato starch (by "Family Elephant")
- 160 ml Water
- 30 g skim milk powder (by "Millac Value")
- 2.7g casein protein (by "My Protein")
- 0.5 g salt
- 3.6 g olive oil (extra virgin olive oil by "Castillo de Canena")
- 0.15 g yellow color (Lemon yellow liquid coloring by: "Mallard Ferriere")

Method:

1. In a saucepan, whisk the potato starch into the water until dissolved and smooth.
2. Slowly heat the mixture, stirring consistently to avoid clumping.
3. Once the mixture thickens, using a hand blender stir in the skim milk protein and casein protein, salt, olive oil and yellow color .

Potato core trail 2:

Ingredients:

- 135 ml water
- 20 g skim milk powder (by "Millac Value")
- 0.5 g salt
- 8 drops potato flavor (13˚ potato by "thekitchenlaboratory")
- 5 drops ultra foam (by "MSK")
- 0.15 g yellow color (Lemon yellow liquid coloring by: "Mallard Ferriere")

Method:

1. In a bowl whisk the skim milk powder and water until it become stiff peaks form.
2. Add salt, potato flavor, ultra foam and yellow color and whisk more.

Assembly of the dish:

10 Place the soil in a circle near the edges of the plate.
11 Place rocks randomly in the plate.
12 In the middle of the plate place the sauce.
13 Remove the inner part of the crust and the mantle.
14 Place the removed part of the mantle in the crust and again remove the middle part of the mantle and fill it in with the core.
15 Put the two spheres on top of each other to create a ball and place that ball on the sauce.

Pictures:

Core 1

Core 2

Rocks

Soil

Core trail 2

Mantle

Crust

What worked, what didn't work and why?

The rocks from the previous week were reused for this attempt. Unfortunately, the accompanying sauce was unsuccessful, as the rocks broke down into small, powdery fragments instead of forming a cohesive sauce. This could be due to insufficient moisture which failed to hold the mixture together.

The crust had good flavor and texture, but challenges arose during assembly. When cut to assemble the components, the crust was sliced too thin, causing it to break apart and lose structural integrity.

The mantle had a pleasant taste and aroma, but its appearance was unappealing, likely due to the absence of added coloring. This impacted the visual appeal, despite the other sensory qualities being satisfactory.

For the core, two variations were evaluated. Core 1 had a sticky, stretchy texture, poor aroma, and was entirely inedible, though its color was visually appealing. The texture issues might have resulted from an imbalance in binding agents or insufficient mixing. Core 2, on the other hand, had a bad appearance but an okay texture, resembling ice cream. This unexpected texture suggests that the formulation or freezing process may have influenced its final state.

What to do next week?

Create the same concept dish with a sweet flavor profile while incorporating vitamin A for added nutritional benefits.

8.8.3 Week 3:

Aim: Create a sweet dish with the same concept and do sensory evaluation.

Raspberry rocks:

Ingredients:

- 60 g mango core gel (instructions are down below)

Method:

8. Take 60g of the solidified mango core gel and cut into small cubes
9. Cut the edges of the cubes to make them look like rocks.

Underneath Sauce

Ingredients:

- 0.2 g green color (Mint green liquid coloring by "Mallard Ferriere")
- 60 g mango core gel (instructions are down below)
- 15 ml water

Method:

Cut the gel into cubes then place in a bowl with some water and blue color and blend using a hand blender until smooth.

Planet

Raspberry crust:

- Brown gel color (by: Il Punto Italiana")
- 3 drops orange food color(orange liquid coloring by: "Mallard Ferriere")
- 1 drop green food color (mint green liquid coloring by: " Mallard Ferriere")
- 400 ml water
- 12 g agar-agar (by "Sosa")
- 2 g sucralose (sucralose sugar-free sweetener by "My Protein")
- 0.5 g raspberry flavor (gerd frambules by "Sosa")
- 30 g collagen and vitamin C powder (by "Bulk")

Method:

9. Prepare the half sphere molds by wearing gloves and making circles with the brown food color in the molds to give it that planet looking effect.
10. In a small saucepan, combine the water and agar-agar. Put on the stove and bring it to a boil while stirring constantly to dissolve the agar-agar completely.
11. Once the agar-agar is dissolved, add the raspberries flavor, sucralose, and green and orange colors and stir well.
12. Take off heat and let it cool for a bit, but without solidifying then add the collagen and vitamin c powder and mix very well until it dissolves.
13. Pour the mixture into molds and refrigerate.

Passion fruit mantle:

Ingredients:

Beverage:

- 200 ml water
- 6 g agar-agar (by "Sosa")

- 1.5 g sucralose (sucralose sugar-free sweetener by "My Protein")
- 1.5 g passion fruit flavor (by "Sosa")

Base:

- 75 g powdered egg whites gallia (by "Luis Francois")
- 130 ml water
- 15 mg iron (3 iron K-pure capsules by "Bulk")
- 0.2 g orange gel color (by "Il Punto Italiana")

Method:

18. Blend the protein and water mixture using a hand mixer or stand mixer on medium to high speed until stiff peaks form. (have a cold plate or ice underneath)
19. While the cream is being mixed prepare the beverage by combining the water and agar-agar in small saucepan. Put on the stove and bring it to a boil while stirring constantly to dissolve the agar-agar completely.
14. Once the agar-agar is dissolved, add the passionfruit flavor, sucralose and stir well.
20. Take off heat and let it cool for a bit without solidifying.
21. Add the beverage to the protein mixture slowly and mix it until they are blended well then add the iron and orange color to create a mousse texture.

Core

- 400 ml Water
- 12g Agar-agar (by "Sosa")
- 2 g sucralose (sucralose sugar-free sweetener by "My Protein")
- 2 g Mango flavor powder (by "Sosa")
- 2 vitamin A drops (Vitamin A Drops 5000 IU by "Vitamze")
- 0.5 g lecithin powder (Lecite by "Texturas Albert & Ferran Adrià")
- 0.15 g yellow color (Lemon yellow liquid coloring by: "Mallard Ferriere")

Method:

22. In a saucepan mix agar-agar, mango flavor with 350 ml water, dissolve the sugar, and heat to dissolve the agar-agar.
23. Drop vitamin A into mixture into the agar-agar solution, stirring constantly to ensure the fat-soluble Vitamin A stays emulsified.
24. Remove off heat and add the yellow color.
25. Pour into small half spheres and refrigerate.

Assembly of the dish:

16 In the middle of the plate place the sauce.
17 Place rocks however you like, some of the mantle mousse can be used to decorate the plate.
18 Remove the inner part of the crust, and fill it up with the mantle mousse.
19 Place the core in the middle of the mantle.
20 Put the two filled crust spheres on top of each other to create a ball and place that ball on the sauce.

Pictures:

What worked, what didn't work and why?

The overall color and appearance of the dish were visually appealing and attractive, complemented by a pleasant aroma. However, the taste fell short of expectations.

All components of the dish were excessively sweet, leading to an overwhelming sweetness that eventually turned bitter, overshadowing the intended flavors. This outcome was attributed to an excessive amount of sucralose added during preparation.

The texture of the dish was largely uniform throughout, which made the sensory experience somewhat monotonous and unengaging.

Additionally, the method of eating the dish was unclear and resulted in a messy presentation, detracting from the overall enjoyment of the culinary experience.

What to do next week?

Create the final dish and fix all the problems.

8.8.4 Week 4:

Aim: Create the final dish " A Taste from Mars".

Mango rocks:

Ingredients:

- 100 ml water
- 1.5 g agar-agar (by "Sosa")
- 0.15 g sucralose powder (sucralose sugar-free sweetener by "My Protein")
- 3 g mango flavor powder (by "Sosa")
- 0.06 g orange food color (2 drops of orange liquid coloring by: "Mallard Ferriere")

Equipment:

- Saucepan
- Whisk

Method:

26. In a saucepan, mix agar-agar, mango flavor with water, dissolve the sucralose, and heat to dissolve the agar-agar.
27. Take off the heat and pour into a small plate with high edges.
28. Set aside 50 g of the mixture to use for creating the sauce later.
29. Add orange color randomly to the remaining mixture in the plate and create a swirling motion with a knife to create a "rock-like" effect.
30. Set it in the fridge and let it cool down.
31. Once solid, cut into small cubes and remove carefully from the plate.
32. Cut the edges of the cubes to give them a natural, rock-like appearance.

Underneath Sauce:

Ingredients:

- 0.06 g green color (2 drops of mint green liquid coloring by "Mallard Ferriere")
- 50 g rocks (instructions are above)
- 15 ml water

Equipment:

- Hand blender
- Metal circle cookie cutter (10 cm)

Method:

4. Before the rocks gel cools completely, add the green color and cut it into cubes.
5. Place the cubes in a bowl with a small amount of water and blend using a hand blender until smooth.
6. Place a circular cookie cutter in the center of the presentation dish. Pour the smooth gel into the cutter and spread it evenly to form a circular base for the planet to sit on.

Planet

Raspberry crust:

- Brown gel color (by Il Punto Italiana")
- 400 ml water
- 6 g agar-agar (by "Sosa")
- 0.5 g sucralose (sucralose sugar-free sweetener by "My Protein")
- 0.09 g natural raspberry flavor (3 drops gerd frambules by "Sosa")
- 30 g collagen and vitamin C powder (by "Bulk")
- 0.09 g orange food color (3 drops of orange liquid coloring by "Mallard Ferriere")
- 0.03 g green food color (1 drop of mint green liquid coloring by " Mallard Ferriere")

Equipment:

- Saucepan
- Whisk
- Half sphere chocolate mould (6 cavity half spheres with 7 cm diameter and 3.5 cm height)

Method:

15. Prepare the half sphere moulds by wearing gloves and making circles with the brown food color in the moulds to give it that planet looking effect.

16. In a small saucepan, combine the water and agar-agar. Put it on the stove and bring it to a boil while stirring constantly to dissolve the agar-agar completely.
17. Once the agar-agar is dissolved, add the raspberries flavor, sucralose, and green and orange colors and stir well.
18. Take off heat and let it cool for a bit, but without solidifying then add the collagen and vitamin c powder and mix very well until it dissolves.
19. Pour the mixture into moulds and refrigerate.

Passion fruit mantle:

Ingredients:

Beverage:

- 100 ml water
- 1.5 g agar-agar (by "Sosa")
- 4 g table sugar
- 0.48 g passion fruit flavor (16 drops by "Sosa")

Base:

- 35 g powdered egg whites gallia (by "Luis Francois")
- 80 ml water
- 3 iron K-pure capsules (by "Bulk")
- 0.12 g orange gel color (by "Il Punto Italiana")

Equipment:

- Stand mixer
- Saucepan
- Whisk

Method:

9. Place the bowl of the standing mixer into the fridge until it becomes cold.
10. Once cold, blend the protein and water mixture using a stand mixer on medium to high speed until stiff peaks form. Place a cold plate or ice underneath to keep the mixture cool.
11. While the protein mixture is being whipped, prepare the beverage: combine water and agar-agar in a small saucepan. Place it on the stove and bring it to a boil, stirring constantly to ensure the agar-agar dissolves completely.

12. Once the agar-agar is fully dissolved, remove the saucepan from the heat, add the passionfruit flavor, and stir well.
13. Allow the mixture to cool slightly but ensure it does not solidify.
14. Slowly add the beverage to the protein mixture, mixing gently until fully incorporated.
15. Open the iron capsules and add the contents to the mixture. Mix in the orange color to achieve a smooth, whipped cream-like texture.
16. Store in the fridge until later.

Mango core:

Ingredients:

- 100 ml water
- 0.11 g sucralose (sucralose sugar-free sweetener by "My Protein")
- 3.5 g mango flavor powder (by "Sosa")
- 0.06 g vitamin A (2 drops of vitamin A drops 5000 IU by "Vitamze")
- 0.5 g lecithin powder (lecite by "Texturas Albert & Ferran Adrià")
- 0.03 g yellow color (lemon yellow liquid coloring by: "Mallard Ferriere")
- 1 g xanthan gum (by "Craic Foods")
- 7 g coconut oil (organic coconut oil by "KTC")
- 6 g corn starch (by Knorr Kingford's)

Equipment:

- Saucepan
- Whisk
- Hand blender
- Half sphere chocolate mould (32 cavity half spheres with 2.6 cm diameter and 1.3 cm height)

Method:

5. In a saucepan, combine 450 ml of water, sucralose, mango powder, yellow color, xanthan gum, and coconut oil. Heat the mixture on low while whisking continuously until all ingredients are incorporated.
6. In a separate small container, mix 50 ml of water with cornstarch until fully dissolved. Then while still heating introduce this mixture into the saucepan while whisking to ensure a smooth and even consistency.
7. Remove the saucepan from the heat and add lecithin and vitamin A oil drops. Blend the mixture thoroughly with a hand blender to achieve a uniform texture.

8. Pour the mixture into small half-sphere molds and freeze until set.

Assembly of the dish:

6. On the plate where the sauce has already been placed, arrange the rocks as desired. Use some of the mantle whipped cream to decorate the plate.
7. Gently remove the inner part of the crust using a slightly heated spoon, making sure not to cut the crust while doing so, and fill the hollow space with the mantle mousse.
8. Position the core in the center of the mantle mousse.
9. Place the two filled crust spheres on top of each other to form a ball, then position the ball on the sauce.
10. The dish can be enjoyed by using the crust as a plate—scoop out the filling and then eat the crust itself.

Pictures:

What worked, what didn't work and why?

Everything is written in detail in the main report.

8.2 Appendix B: Ingredients used in "A Taste from Mars"

Ingredients		
Agar-agar (by "Sosa")	Sucralose (sucralose sugar-free sweetener by "My Protein")	Mango flavor powder (by "Sosa")

		
Yellow food color (lemon yellow liquid coloring by: "Mallard Ferriere") 	Orange gel food color (orange liquid coloring by: "Mallard Ferriere") 	Green food color (mint green liquid coloring by: "Mallard Ferriere") 
Brown gel food color (by: Il Punto Italiana") 	Raspberry flavor (by "Sosa") 	Collagen and vitamin C powder (by "Bulk") 
Passion fruit flavor (by "Sosa")	Powdered egg whites (by "Luis Francois")	Iron (K-pure capsules by "Bulk")

		
Corn starch (by Knorr) 	Vitamin A drops (Vitamin A Drops 5000 IU by "Vitamze") 	Xanthan gum (by "Craic Foods") 
Coconut oil (by "KTC") 	Lecithin (Lecite by "Texturas Albert & Ferran Adrià") 	

8.3 Appendix C: Equipment used in "A Taste from Mars"

Equipment		
Saucepan 	Whisk 	Hand blender 
Metal circle cookie cutter (10 cm) 	Half sphere chocolate mould (6 cavity half spheres with 7 cm diameter and 3.5 cm height) 	Stand mixer 
Half sphere chocolate mould (32 cavity half spheres with 2.6 cm diameter and 1.3 cm height) 		

8.4 Appendix D: Sensory Evaluation Form

Sensory Evaluation Form

( )

Please provide your feedback on the sensory experience :)

Attributes	**Dislike very much**	**Dislike slightly**	**Neither like nor dislike**	**Like slightly**	**Like very much**
Color					
Attractiveness					
Aroma					
Texture					
Taste					
Overall product					

1= Dislike very much

2= Dislike slightly

3= Neither like nor dislike

4= Like slightly

5= Like very much

Comments:

8.5 Appendix E: Nutritional report -Nutritics

Nuutritics file is attached to this report as a pdf.