

INTERNSHIP REPORT
**Customer Acceptance of Immune Booster Yogurt using
different IFF Flavor**

By

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Submitted to

i3L – Indonesia International Institute for Life Sciences
School of Life Sciences

in partial fulfillment of the enrichment program for the Bachelor of Science in
Food Science and Nutrition

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Jakarta, Indonesia
2022

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ABSTRACT

IFF is a flavor-house company that focuses on flavor while utilizing the B2B concept. Lots of sectors could be found in the flavoring plant, and among them is dairy products. Immune has been a novel trending topic at the present and therefore enhancing dairy products such as yogurt using immune booster premix would be recommended and beneficial. Hence, the customer's acceptance could be increased with the usage of flavoring, and it should be in the same direction as the Immune System concept. The fruit flavor was preferable because it represents immunity as well as being in the same order as the yogurt's characteristics. Customer acceptance was determined using the random sampling method, and tests were done using a 9-point hedonic scale. One-way ANOVA statistical analysis was then used to find out the significance of each parameter and the result displays that among all flavors, cranberry has the highest grade on most of the parameters except aroma and aftertaste.

Keywords: Immunity, Yogurt, Premix

ACKNOWLEDGEMENTS

This is a page acknowledging people who provided the student with assistance in the project, notably, but not only the project supervisor.

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LIST OF ABBREVIATIONS

IFF: International Flavor and Fragrance

UHT: Ultra High-Temperature

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I. INTRODUCTION

The introduction should include the following information about the placement company/institution:

1. A brief history

International Flavor and Fragrances was established in 1958 after a merger between the worldwide operations of Polak & Schwarz and van Ameringen-Haebler. Then it became a significant supplier in the Flavor and Fragrance business. It began in New York and started to branch to New Jersey. In 1967, the Research and Development center was developed in Union Beach. Between 1970 - 2000, IFF begin to create new technology which was using Solid Phase Micro Extraction and develop Mood Mapping. In Indonesia itself, it began in the year 1968, the MOU start to be signed by the local government officials and International Flavors and Frgrances Inc. In 1969 the company is being handed over to International Flavors and Fragrances. Where before it was handed offer, The company was named NV Essence Indonesia which started on the year 1958.

IFF then develops the fragrance plan in the year 1983 and 1994 then develop the flavoring plant. Due to new standards in Indonesia, where there should be no factories near rural areas. Karawang Phase 1 begins to develop and focuses more on spray drying. Finally, in recent years 2021 IFF finally done an Acquisition with DuPont Nutrition & Biosciences and Karawang started to develop Liquid and Powder Flavorant.

2. Vision and mission

Vision: Our Strategy for Future Success is to Be the partner for essential solutions

Mission:

1. Act as an owner, Take ownership and work with passion and integrity. Our teams are empowered to make decisions and help the entire organization thrive
2. Be Agile, Constantly push for progress and respond to the needs of our customers and the world with speed, skill, and creativity
3. Collaborate and Win Together, creating bonding with the customers and colleagues powers innovation and our shared success.

3. The main activity

There are a lot of sectors in the IFF department, whereas, in the big sector, IFF is divided into Fragrance and Flavor, Inside the Flavor area, there are Flavor Bank, Creative, and Creative and Application departments which will focus on different things. Flavor Bank focuses more on finding the direction of the flavor. The creative department focuses on a molecular part by creating the preferable direction toward the target. The author is put in the Creative and Application area where the company project by doing trial and tasting to find the most suitable in the majority of the pallets. Where there are subsections in a sweet area that cover baked goods, dairy products, powder products, and syrup. The author is put on the dairy area that focuses on milk, yogurt, creamer, and ice cream. Most of the time, there are several projects that must be done and the objective is according to the customer. The author's job is to help the supervisor to find the flavor direction with the objective that has been given.

During the author internship program, there is a lot of knowledge that can be gained including company procedures for customers and the science of food additives regarding beverages. During IFF, the author starts filling all the water heater and micropipette tips, ensuring all the water in the water bath is sufficient to pasteurize all the beverage samples. The author also input the data of the flavor, raw materials, and extract to Excel. Furthermore, learning using basic analytical methods such as refractometers, pH-meter, and high-shear machines. Sometimes, the author also prepares a sample for the panelist for tasting. Due to the new placement on IFF, most of the time, the author helps the supervisor clean a specific place and organize it.

Organizational structure

4. The student's unit or department



Figure 1. Organizational Structure of Dairy, Beverages, and Sweet Department

II. INTERNSHIP ACTIVITIES

Table 1. Daily Activities on August

No.	Date (DD/MM/YYYY)	Activity
1	1-Aug-22	<ul style="list-style-type: none"> ● Learn to make RTD Sugar Solution ● Introduction to the Dairy Machine
2	2-Aug-22	<ul style="list-style-type: none"> ● Searching Raw Material ● Introduction to the chocolate milk RTD
3	3-Aug-22	<ul style="list-style-type: none"> ● Searching for Raw Material ● Learn to use IFFman software ● Labeling and Packing ● Making Chocolate Milk RTD drink
4	4-Aug-22	<ul style="list-style-type: none"> ● Learn to use stabilizer and Flavoring ● Raw Material Searching ● Create RTD Coffee milk
5	5-Aug-22	<ul style="list-style-type: none"> ● Searching RM ● Use Flavoring Food Additives
6	8-Aug-22	<ul style="list-style-type: none"> ● Flavors sortation ● Raw Material searching ● Repacking Instant Coffee
7	9-Aug-22	<ul style="list-style-type: none"> ● Almond Milk base making ● Preparing Sample
8	10-Aug-22	<ul style="list-style-type: none"> ● Chocolate milk base creation ● Cloudifier Weighing ● Orange PSD making
9	11-Aug-22	<ul style="list-style-type: none"> ● Raw Material Sortation ● Coffee Milk RTD making ● Consumer testing of Potato chips
10	12-Aug-22	<ul style="list-style-type: none"> ● Preparing Sensory Evaluation ● Raw Material Searching ● Yoghurt Flavor Development
11	15-Aug-22	<ul style="list-style-type: none"> ● Soy Multigrain RTD development ● Learn to use micropipette for Flavoring
12	16-Aug-22	<ul style="list-style-type: none"> ● Flavor Addition to Coffee RTD
13	18-Aug-22	<ul style="list-style-type: none"> ● Preparation of Internal Rollout Yoghurt drink ● Mixing Colorant and Yoghurt Base Drink
14	19-Aug-22	<ul style="list-style-type: none"> ● RTD Soy Multigrain development ● Submission preparation ● Milkshake and Yoghurt Sortation and Organization

		<ul style="list-style-type: none"> ● Introduction to UHT Processing ● Clean-fill Chocolate Almond Drink
15	22-Aug-22	<ul style="list-style-type: none"> ● Creating RTD soy multigrain ● Raw Material Searching ● Jelly Packaging
16	23-Aug-22	<ul style="list-style-type: none"> ● RTD of Chocolate Almond Milk ● Coffee Milk RTD Creation
17	24-Aug-22	<ul style="list-style-type: none"> ● Flavor and Material Packing ● Jelly Packaging for Local Refreshment
18	25-Aug-22	<ul style="list-style-type: none"> ● Creating PSD Strawberry Tea ● Creating RTD Coffee Konjac ● Preparing Internal Roll Out 2 in 1 Creamer
19	26-Aug-22	<ul style="list-style-type: none"> ● Creating PSD Strawberry Tea ● Searching for Raw Material ● Organizing Raw Material and Sortation in Excel
20	29-Aug-22	<ul style="list-style-type: none"> ● Searching Flavor <p>Create RTD Multigrain using Soylicious base</p>

Table 2. Daily Activities on September

No.	Date (DD/MM/YYYY)	Activity
1	1-Sep-22	<ul style="list-style-type: none"> ● Develop Milk Flavor ● Organizing Extract
2	2-Sep-22	<ul style="list-style-type: none"> ● Weigh Coffee PSD for Nescafe ● Pasteurize smoothies base & Flavor addition ● Organizing RM
3	5-Sep-22	<ul style="list-style-type: none"> ● Develop 2 in 1 creamer for Coffee & Thai tea ● RM searching ● Organizing refrigerator
4	6-Sep-22	<ul style="list-style-type: none"> ● Making 70% syrup base ● Making Oat Soy Milk Energy Drink base ● Observe the gelling in milk base
5	7-Sep-22	<ul style="list-style-type: none"> ● Calculating Sugar Syrup base on density ● Making packaging for External Roll out 2 in 1 Creamer
6	8-Sep-22	<ul style="list-style-type: none"> ● Weigh date powder ● Pack Creamer for external rollout ● Doing Stabilizer experiment
7	9-Sep-22	<ul style="list-style-type: none"> ● Coconut yoghurt pH calibration

		<ul style="list-style-type: none"> ● Learning how to calibrate pH meter
8	12-Sep-22	<ul style="list-style-type: none"> ● Run UHT for GGF ● Make packing base
9	13-Sep-22	<ul style="list-style-type: none"> ● Making packaging for External Roll out
10	14-Sep-22	<ul style="list-style-type: none"> ● Preparing Sensory Evaluation ● Raw Material Searching ● Yoghurt Flavor Development
11	15-Sep-22	<ul style="list-style-type: none"> ● Soy Multigrain RTD development ● Flavor Searching
12	16-Sep-22	<ul style="list-style-type: none"> ● pH meter calibration ● Adding acid to get the required pH
13	19-Sep-22	<ul style="list-style-type: none"> ● Preparation of Internal Rollout Yoghurt drink ● Mixing Colorant and Yoghurt Base Drink
14	20-Sep-22	<ul style="list-style-type: none"> ● RTD Soy Multigrain development ● Submission preparation ● Milkshake and Yoghurt Sortation and Organization ● Introduction to UHT Processing ● Clean-fill Chocolate Almond Drink
15	21-Sep-22	<ul style="list-style-type: none"> ● Stabilizer Test ● Oat Base Making ● Market Sample Cleaning
16	22-Sep-22	<ul style="list-style-type: none"> ● Oat base making + flavor ● Learn to use Hot filling method ● Customer acceptance
17	23-Sep-22	<ul style="list-style-type: none"> ● Organizing Refrigerator ● Packing for company Innovation .day ● Customer Acceptance
18	26-Sep-22	<ul style="list-style-type: none"> ● Assist to pack for company Innovation day
19	27-Sep-22	<ul style="list-style-type: none"> ● Finding the optimum temperature to seal tea-bag ● Flavor Searching
20	28-Sep-22	<ul style="list-style-type: none"> ● Making Sugar Solution ● Assisting to develop coconut yoghurt ● Flavor Searching ● Differentiate Natural Flavoring and Synthetic Flavoring
21	29-Sep-22	<ul style="list-style-type: none"> ● Flavor Searching ● Assist to find the right concentration for food coloring ● Pasteurized Milk and Cooling ● Making Sugar and Stabilizer base

22	30-Sep-22	<ul style="list-style-type: none"> ● Flavor Searching ● Making Coconut Yoghurt Submission ● Brainstorming project idea of “Immune Booster Yoghurt”
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Table 3. Daily Activities on October

No.	Date (DD/MM/YYYY)	Activity
1	3-Oct-22	<ul style="list-style-type: none"> ● Flavor Searching ● Organizing Stabilizer
2	4-Oct-22	<ul style="list-style-type: none"> ● Preparing Coffee and White SCM
3	5-Oct-22	<ul style="list-style-type: none"> ● Running UHT Machine for Plant Based Milk ● Preparing Plant based milk base
4	6-Oct-22	<ul style="list-style-type: none"> ● Preparing base for Submission
5	7-Oct-22	<ul style="list-style-type: none"> ● Packing 2 in 1 Creamer for submission ● Preparing for Yoghurt and Milkshake Submission
6	10-Oct-22	<ul style="list-style-type: none"> ● UHT Product Tasting ● Develop Plant based milk flavor
7	11-Oct-22	<ul style="list-style-type: none"> ● Internship Project Flavor Development
8	12-Oct-22	<ul style="list-style-type: none"> ● Internship Project Color Development ● Flavor Searching
9	13-Oct-22	<ul style="list-style-type: none"> ● Office Outing
10	14-Oct-22	<ul style="list-style-type: none"> ● Office Outing
11	17-Oct-22	<ul style="list-style-type: none"> ● Internship Project Development
12	18-Oct-22	<ul style="list-style-type: none"> ● Learn to use IFFman software ● Classification of Flavor
13	19-Oct-22	<ul style="list-style-type: none"> ● Repack Solid Flavor ● Flavor Classification
14	20-Oct-22	<ul style="list-style-type: none"> ● Coffee SCM Development ● Data input to Excel ● Bank and Non-Bank Flavor Determination
15	21-Oct-22	<ul style="list-style-type: none"> ● Coffee SCM Development ● Data input to Excel ● Bank and Non-Bank Flavor Determination
16	24-Oct-22	<ul style="list-style-type: none"> ● Organizing Market Sample ● Organizing Lab to be more tidy

		<ul style="list-style-type: none"> ● Repacking Flavor ● Learning about Dilution
17	25-Oct-22	<ul style="list-style-type: none"> ● Internship Project Flavor Development
18	26-Oct-22	<ul style="list-style-type: none"> ● Help to Develop New Flavor for SCM
19	27-Oct-22	<ul style="list-style-type: none"> ● Flavor Data ● Development of New Flavor SCM
20	28-Oct-22	<ul style="list-style-type: none"> ● Development of New Flavor SCM ● Organizing Flavor ● Making Coffee RTD Base ● Flavor Searching ● Help to Develop Chocolate Flavor Extender
21	31-Oct-22	<ul style="list-style-type: none"> ● Help to develop Cocoa Milk ● Help to develop cocoa extender milk beverages ● Making Coffee Base ● Organizing Flavor

Table 4. Daily Activities on November

No.	Date (DD/MM/YYYY)	Activity
1	1-Nov-22	<ul style="list-style-type: none"> ● Flavor Searching ● Help to develop coffee SCM
2	2-Nov-22	<ul style="list-style-type: none"> ● Oat Ice Cream base Making ● Help to develop Coffee SCM ● Run Homogenizer ● Homogenizer Cleaning
3	3-Nov-22	<ul style="list-style-type: none"> ● Oat Ice Cream making ● Coffee SCM Development ● Flavor Searching
4	4-Nov-22	<ul style="list-style-type: none"> ● Help to do Coffee SCM workshop ● Flavor Organizing
5	7-Nov-22	<ul style="list-style-type: none"> ● Flavor Organizing ● Internship Project Development ● Flavor Searching ● Help to develop Coffee SCM ● Stabilizer Organizing
6	8-Nov-22	<ul style="list-style-type: none"> ● Ice Packing for UHT ● Weight Coffee SCM for Testing ● Flavor Searching ● Comparing stabilizer for Coffee RTD
7	9-Nov-22	<ul style="list-style-type: none"> ● Ice Packing for UHT ● Organizing Refrigerator
8	10-Nov-22	<ul style="list-style-type: none"> ● UHT Running ● Making Milk base ● Run Homogenizer ● Homogenizer Cleaning

		<ul style="list-style-type: none"> ● Weight Raw Material
9	11-Nov-22	<ul style="list-style-type: none"> ● UHT Running ● Making Milk base ● Run Homogenizer ● Homogenizer Cleaning ● Weight Raw Material ● Weight Coffee SCM
10	14-Nov-22	<ul style="list-style-type: none"> ● Help to Develop Milkshake and Yogurt ● Packing for distribution ● Refrigerator Organizing
11	15-Nov-22	<ul style="list-style-type: none"> ● Weight SKM for CLT ● Become CLT Panel Leader ● Dilute Sample for SKM ● Preparing CLT
12	16-Nov-22	<ul style="list-style-type: none"> ● Weight SKM for CLT ● Become CLT Panel Leader ● Dilute Sample for SKM ● Preparing CLT
13	17-Nov-22	<ul style="list-style-type: none"> ● Weight for Chocolate SCM ● Prepare Santen Base ● Flavor Searching
14	18-Nov-22	<ul style="list-style-type: none"> ● Prepare Chocolate Base Milk Weight Milkshake and Yogurt LNR
15	21-Nov-22	<ul style="list-style-type: none"> ● Prepare Chocolate SCC ● Flavor Searching ● Prepare Strawberry Milk base
16	22-Nov-22	<ul style="list-style-type: none"> ● Help to develop Yogurt and Milkshake
17	23-Nov-22	<ul style="list-style-type: none"> ● Become Sensory Panel Leader for Milk
18	24-Nov-22	<ul style="list-style-type: none"> ● Help to make Chocolate Milk Base ● Help to prepare Continuous Cooling
19	25-Nov-22	<ul style="list-style-type: none"> ● Help to make Chocolate Milk Base ● Weight Chocolate SCM for tasting
20	28-Nov-22	<ul style="list-style-type: none"> ● Organizing Area for Refrigerator ● Weight Chocolate SCM for CLT
21	29-Nov-22	<ul style="list-style-type: none"> ● Homogenizer Cleaning ● Help to start up refrigerator ● Help to find the chocolate powder ratio
22	30-Nov-22	<ul style="list-style-type: none"> ● Helping Stabilizer Trial for Milkshake ● Run UHT for Chocolate Milk ● Preparing Chocolate Milk Base

2.1 Daily Activities during Internship

2.1.1. Daily Main Activities

During the internship, the author's job mainly helped the supervisor finish the project. Starting in the morning, the intern is obliged to come at 7.30 a.m. then further both the water heater and water bath need to be filled. Next, the author also fills up the micropipette tips for the staff. Most of the beverage projects are using high shear machines and analytical balance. The author helps the supervisor by weighing raw materials and also mixing with the high shear machine. The high shear machine is done to homogenize particle objects such as stabilizers, oil, and powder material (Franceschinis et al., 2014) The author mainly doing a dairy project which will get used to using UHT and Homogenizers.

2.1.2. UHT Project

When there is a project that needs to be submitted to the customer, the broiler of the UHT will then be filled using demineralized water. UHT machines are mainly to increase the shelf life of certain beverages (Karlsson, et al., 2019). Dairy is one of the most common beverage to use UHT machine, due to the fact, the bacterial content in milk is high and have a lot of nutrients to support bacterial growth (Knight-Jones et al., 2016; Adeniji, 2019). Then the machine will be cleaned up and sterilized before being used using hot water to record if there is any irregular pressure fluctuation. Homogenizer helps to reduce the size of the globule size to submicron size, which gives effect sensorial quality and prolongs shelf life (Innocente, 2016). To stop the cooking process after heating and homogenization, cooling using a cooling bath is used by filling the container with water and ice. To prevent the machine from developing crust, especially when dealing with cocoa. The machine needs to be cleaned using Base and Acid.

2.1.3. Acidified Milk

Acidic Beverages must be maintained at low pH, Thus using an appropriate instrument such as a pH meter to get the designated pH. Most of Yogurt or Acidified milk ranging pH from 4.1- 4.3. However, most of the beverages have a pH of 6.5-7. Thus, adding an acid such as citric or lactic acid will lower the pH to particular acidity. The type of acid is determined by whether the flavor direction is fruity or creamy acid. The author first calibrates the pH meter to gain an accurate pH. Then take a small amount of the sample and add using acid until certain pH. Finally, record the weight of the acid that was used to decrease the pH. The weight is used as the ratio for a bigger solution.

2.1.4. Customer Submission

Most of the sample is for customer submission, hence, filling through the sterile bottle and packing is done. The author learns two kinds of filling which are cold filling and hot filling. Hot filling is started by pasteurizing the sample in 90-100 degree celsius for 10 minutes then pouring directly into the hot fill bottle. This method have long shelf life due to minimal contact for bacterial contamination

2.1.5. Plant-Based Ice Cream

Since nowadays people tend to get healthy food, Plant-Based Milk Projects are trending. One of the derivatives of dairy products is ice cream. Throughout the internship, the author learn to use the ice cream machine and which stabilizer is used to gain the thick cream base before pour into the ice cream machine.

2.1.6. Flavor Data Input

Sometimes there are flavors that are not monitored, most of the time, the flavor that is stored is expired. Thus the author must request a new flavor to the industry and throw away the expired one. Furthermore, the author data the new flavor using software and tick

which of the following flavor categorized into. Moreover, the data will be input to excel to easily maintain the expiration date and the availability of that certain flavor.

2.1.7. Sensory Panel Leader

The customer often demands sensory data information, in order to be analyzed their new products. The author is required to exhibit sensory evaluation for specific products. The type of sensory test depends on the objective that is required. Usually, the triangle test and hedonic test are used for the test.

2.1.8. Organizing Materials and Equipment

Due to the reconstruction of the company, the author helped to organize all the samples and equipment that are used. Some of the material must be repacked and put in a certain place. To make it easier to be located, most of the material is input to excel and labeled.

2.1.9. Flavor Dillution

Flavor form can be categorized as Powder and Liquid, where most of them are very concentrated. However the analytical balance only could weight in three decimal places, where some of flavor could only be used in a very small amount. The author will dilute the flavor to 10% or 1 % dilution depending on the power of the flavor. The dilutor should have a criteria, non-toxic and not adding certain flavor. Hence, to dilute powder, maltodextrin is used and for liquid it could use water, propylene glycol, or alcohol, depends on its solubility.

2.2 Main Project

For the final project, the author is interested in immune-boosting yogurt. Hence, a fruity flavor is chosen since it describes immunity and is suitable for yogurt taste (Miles & Calder, 2021; Kamber & Harmankaya, 2019). Pectin is used as a stabilizer to increase the molecular bond between yogurt and water and also increase the sensorial quality and texture (Mohmed,2012). Pre-heat before hydration using high shear mixing are important since pectin hydrate at 80°C (Karim et al., 2014). In Acidic condition, pectin act as a stabilizer for dairy product since it bind the protein (Leroux, et al.,2004). Furthermore, plain yogurt was added to improve the texture and adding probiotic to the drink. Before went through high shear or homogenization. The sample must be preheat to deposition the fat and protein molecule (Srichantra et al., 2018).

Regardless of the knowledge, there are also difficulties that the author encountered, adapting to a new environment and technologies in a fast-paced are quite challenging. Furthermore, the author had difficulties managing the time doing the Internship Report and Work Project which were time and energy-consuming.

III. PROJECT DESCRIPTION

A. Introduction

Immunity has been important for the last few decades since in the last four decades there have been a lot of pandemics that infect huge numbers of people (Roychoudhury, et. al., 2020). Due to the pandemic, a lot of factors could impact the economy and others' health which could result in death (Rana et al., 2021). On the other hand, food has a huge impact on immunity which results in reducing the chance of getting diseases by maintaining cell health (Childs et al., 2019). Vitamin C, D, and Zinc are the major micronutrients that contribute to maintaining immune cells. (Aranow, 2011; Carr & Maggini, 2017; Prasad, 2008)

Probiotics are also one of the most important factors for immunity since they consist of bifidobacterium that contains components that are beneficial for the host (Ruiz et al., 2017). Consuming probiotics regulates the host's innate and adaptive immune by increasing the functions of dendritic cells, macrophages, and T and B lymphocytes (Yan & Polk, 2011). Since probiotics don't damage cells, probiotics categorize as good bacteria. With an adequate amount of probiotics, the bacteria could perform colonization to destroy harmful bacteria that can cause infection (Deepa & Mehta, 2009).

Furthermore, ready-to-drink yogurt is more common in spite of nutritional supplements, and more over-drinkable yogurt is more catching interest due to the fact, drinkable yogurt is more flavorful rather than supplements. Moreover, Lactic Acid play role in adding flavor to yogurt by giving lactic acid which causes sourness (Chen et al., 2017). Adding fruit flavor to yogurt will also increase customers' degree of liking the yogurt due to the aroma and the sour combination (Chollet et al., 2013).

Hence, In this experiment, sensory evaluation of the drinkable yogurt that fortified using vitamin and mineral premix that consist of Vitamin C, Vitamin D and Zinc, will be analyzed using a 9-point hedonic test which of the following flavor will be the best to characterize immune boosters and the most preferable for them to drink daily. The flavors that are chosen also represent immunity, hence, fruits flavor are chosen which are Cranberry, Yuzu Vanilla, and Mango Kiwi. Since those fruits are high in vitamin C which is a common nutrient for the immune system. Those particular flavor are chosen due to the fact that fruits are high in vitamin C and relate to immunity except for vanilla (Gibson et al, 2012).

a. Overall Methodology of Immune Booster Yogurt Development



Figure 2. Overview Methodology of Immune Booster Yogrut Development

In immune booster yogurt there are 4 main steps that are critical, which start from the flavor screening. In Flavor screening will be a crucial step since it will determine the output of the flavor will it be suitable or unsuitable for certain product. Next, the base making, in this step only the basic flavor is added, without specific flavor addition. Stabilizer also need to be added to prevent any separation during refrigerating. Furthermore, the base will be added with flavor to give particular characteristics using chemical compounds. Finally, the sensory data will be analyzed from certain respondent to represent the customer.

b. Flavor Screening

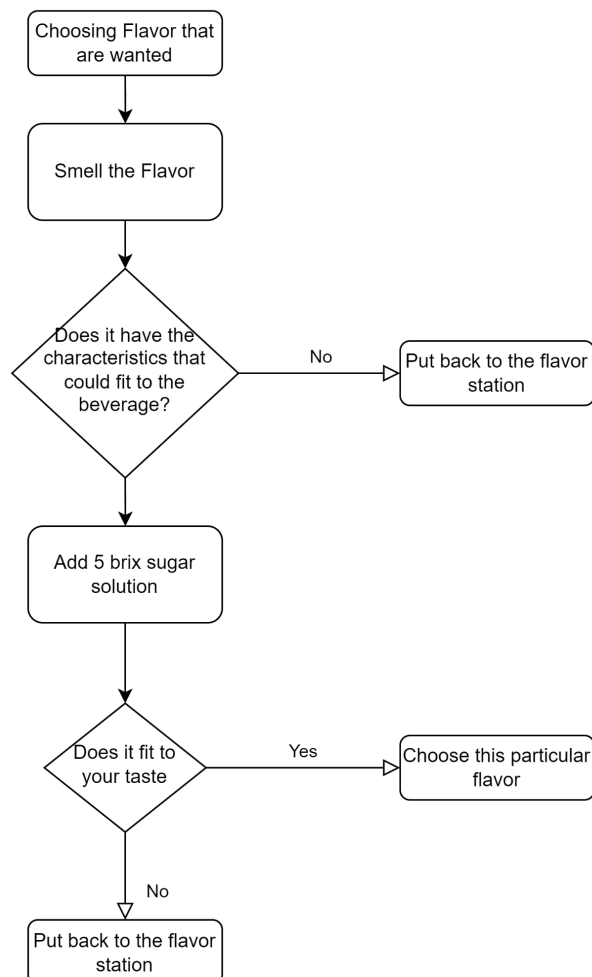


Figure 3. Methodology of Flavor Screening

Flavor are crucial role in beverages that cause sensory acceptable or not. Hence, flavor screening must be done carefully and getting advice from the expert regarding the concentration and the direction of the aroma and flavor. Except of the aroma, the flavor when ingested also need to be tested, since it could give different direction from the aroma. Hence, sugar solution should be use to characterize the flavor.

c. Yogurt Base Making

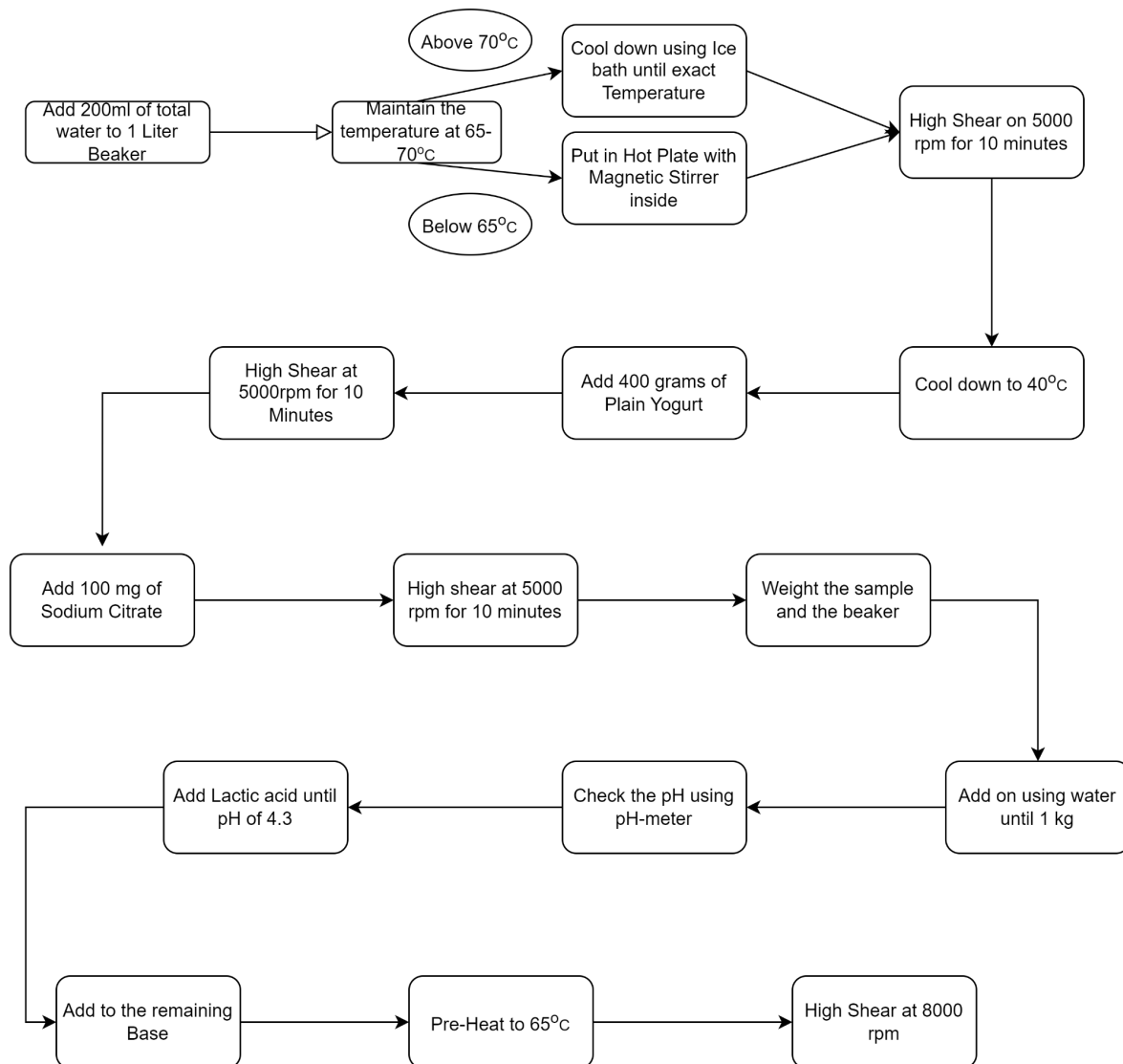


Figure 4. Methodology of Yogurt Base Making

Base contributes to the basic flavor such as sweet, sour, and salty. Maintaining the concentration of sugar and acid will give impact to the flavor direction and flavor choice. The ratio of raw material is based on trial or customer preference, thus the concentration could be varied. Stabilizer need to be hydrolyze in the high temperature before it could activate it's function, in this way, the water should be pre heat to certain temperature depending on the stabilizer characteristics.

d. Yogurt Base Flavoring Flow Chart

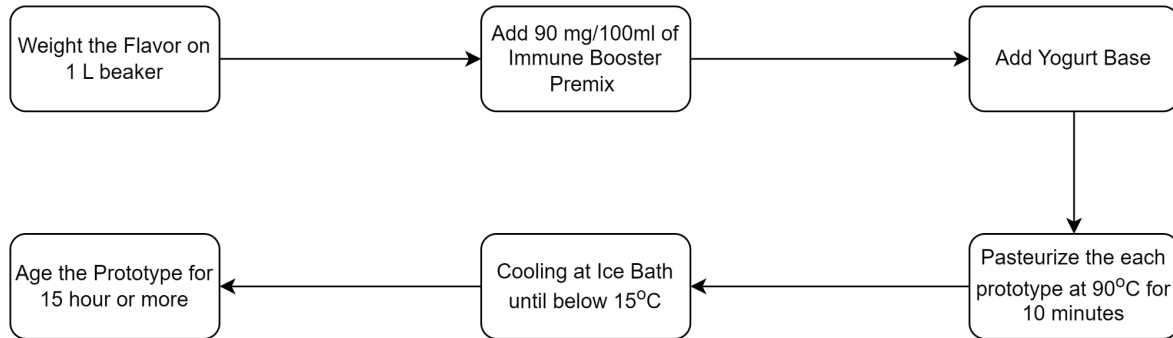


Figure 5. Methodology of Yogurt Flavoring

After the base is cooled, flavor is added with certain concentration (Appendix 3). The concentration are really important due to the concentrated amount of the compounds. Improving the homogeneity of flavor aging is required for at least 15 hours after the addition of flavor. Finally, the sample is stored at refrigerator temperature to maintain its shelf life and sensorial quality.

e. Sensory Flow Chart

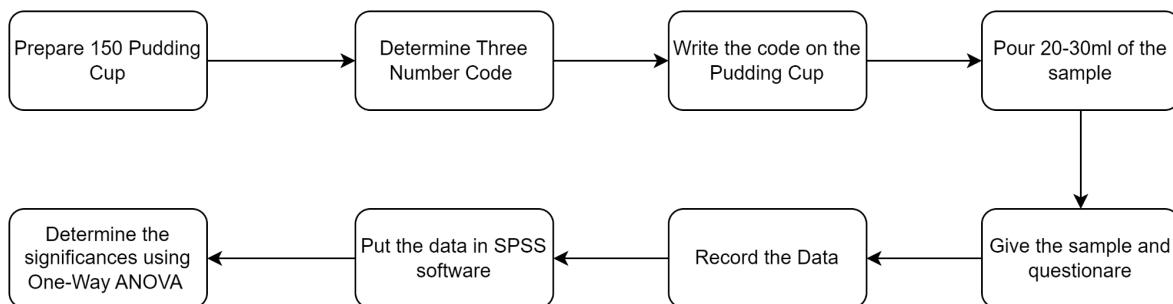


Figure 6. Sensory and Data Analysis Methodology

Finally, the data should be obtained from the panelist to identify which sample of specific flavor are preferable. The author could only obtain 46 panelist due to the limitation of the materials and panelist. Furthermore, the data will be analyzed using SPSS software to determine the significances of the data.

B. Result and discussion

From the data collected, all of the flavors are categorized as liked with an average of Cranberry, Yuzu and Vanilla, and Mango Kiwi 7.2, 6, 7, and 6.98 respectively *Table x*.

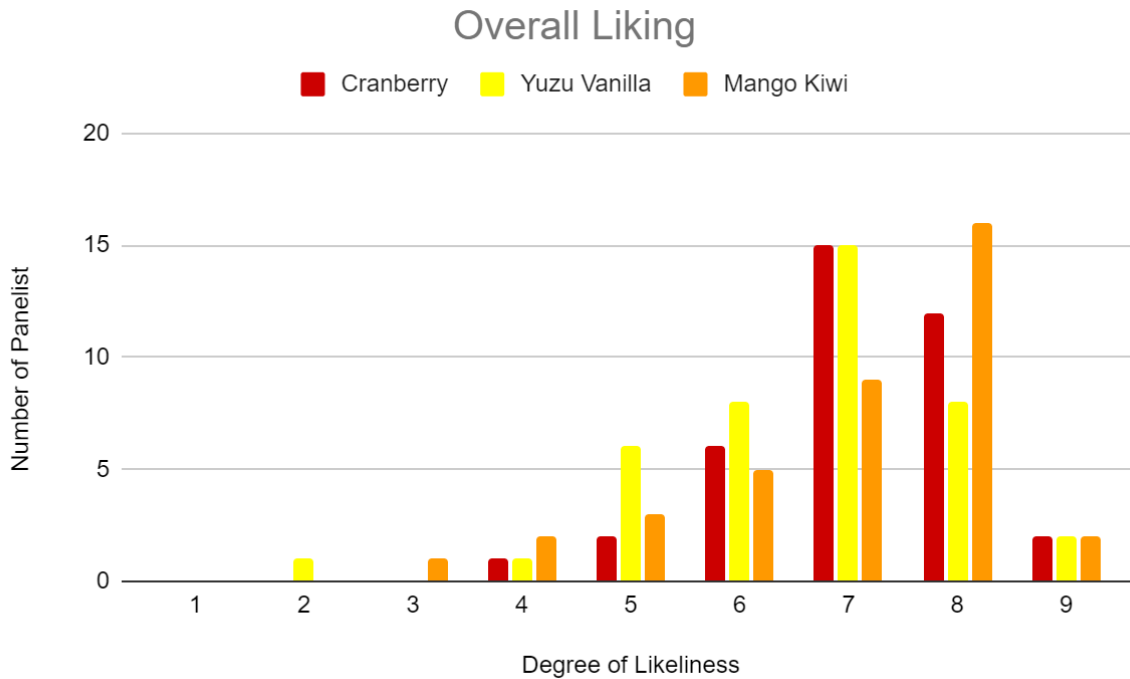


Figure 7. Likeliness Chart towards Different Flavor Varieties of Yogurt

Distribution of Cranberry is more homogeneous rather than Yuzu Vanilla and Mango Kiwi, while the mode of Cranberry and Yuzu Vanilla is 7, and of Mango Kiwi is 8. Both Yuzu Vanilla and Mango Kiwi some of the participants dislike the flavor.

Table 5. Mean value and standard deviation of all parameters for hedonic test

	Aroma	Sweetness	Sourness	Texture	Flavor	Mouthfeel	Creaminess	Aftertaste	Overall Liking
A	6.85±1.18	7.00±1.12	6.93±1.21	7.02±0.97	7.24±1.16	7.07±1.33	6.76±1.13	6.50±1.43	7.24±1.09
B	7.13±1.10	6.80±1.03	6.59±1.24	6.61±1.22	6.87±1.44	6.72±1.44	6.46±1.21	6.28±1.38	6.70±1.37
C	7.39±1.17	6.83±1.39	6.72±1.41	6.89±1.29	7.07±1.59	6.89±1.29	6.65±1.27	6.83±1.32	6.98±1.47

Likelihood of Immune Booster Yogurt Flavor

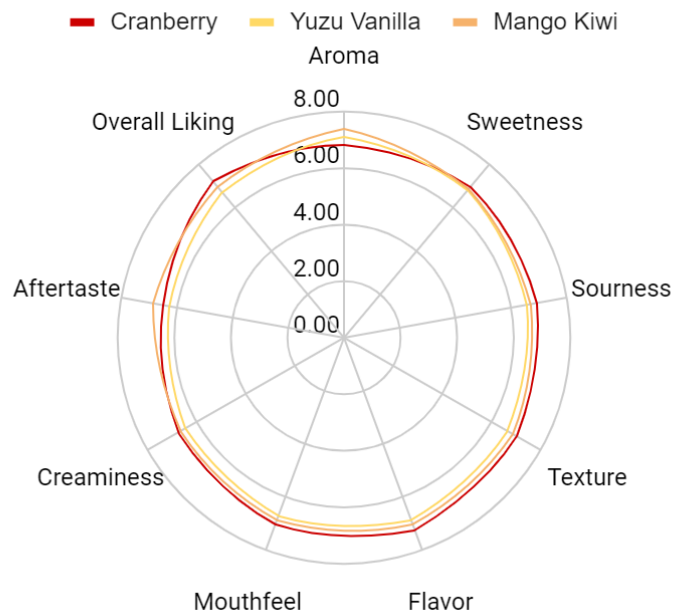


Figure 8. Spider Web Charts Likelihood of Different Parameters of Immune Booster Yogurt Flavor

From the graph above cranberry have the most likeliness score rather than the other flavor, however, the aroma and aftertaste of cranberry are not stand out as the Mango Kiwi flavor. On the other hand, the Yuzu Vanilla flavor has never been seen as inconceivable rather to Cranberry and Mango Kiwi. Whereas volatile compounds are responsible for the flavor, hence, the contribution of the volatile compounds will be critical (Lomelí-Martín et al., 2021). The boiling point of the volatile compound will have a huge effect on the aroma profile (Ge et al., 2021). Furthermore, boiling points of some of the volatile compounds in cranberry are fewer rather than in Yuzu, Mango, and Kiwi (Pino et al., 2005; Zhang et al., 2017; Zhu et al., 2016; Zhang et al., 2016)

Using the Homogeneity test (Appendix 1), the results can be interpreted that there are no significancies between each product from all of the parameters. Hence one-way ANOVA is used as the statistic for analyzing between parameters and product.

From the table above there is no significant difference between the groups where all of the parameters show all respondents agreed that the following flavor is acceptable. According to Weizjen et al, 2008 exposure to the same food for a long period of time will reduce satiety and gratification. Most of the panelists at IFF are frequently exposed to certain beverages, hence, some of the flavors are not well received by them. On the other hand, participants that are rarely exposed to that particular beverage will tend to give higher grades.

Agreement Participant towards the flavor profile

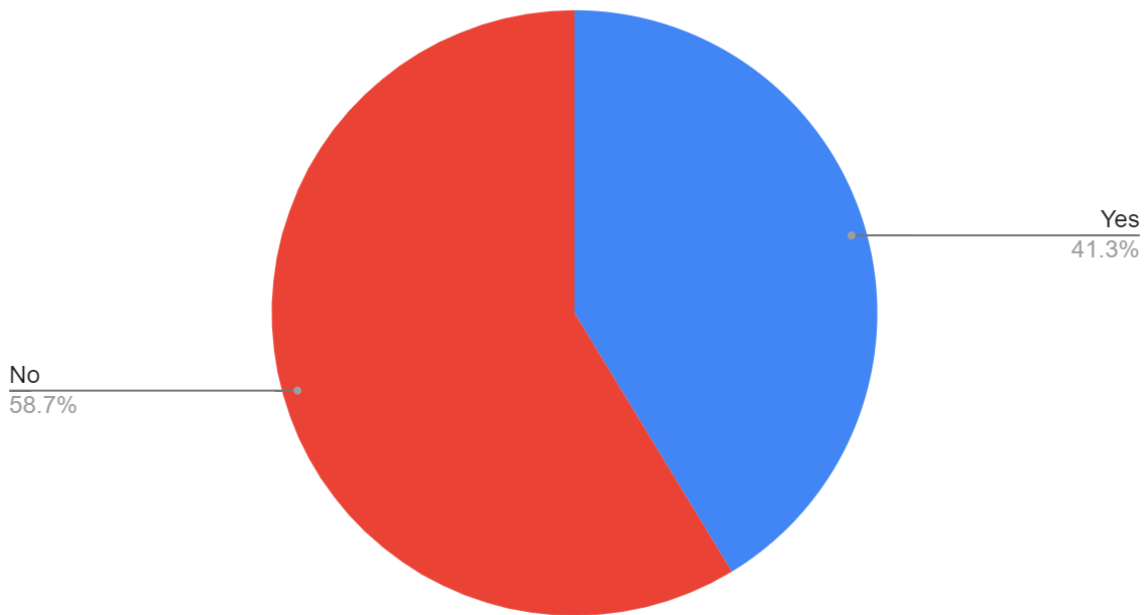


Figure 9. Agreement between participants regarding the flavor direction

Among the participants (n=46) 41.3% agree that the flavor categorizes as Immune Booster flavor, Moreover, 58.7 of participants disagree with the statement.

Degree of Disagreement towards Immune Flavor

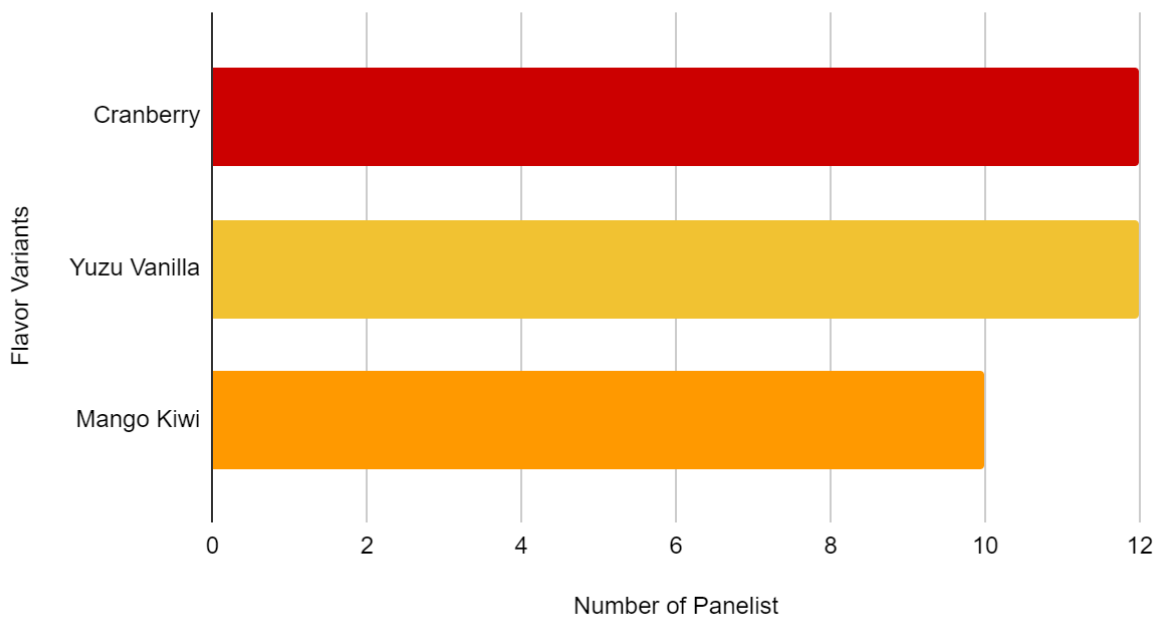


Figure 10. The number of participants that disagree with specific flavors on the direction of the flavor

Most of the participants disagree that the Cranberry and Yuzu Vanilla Flavors. It is due to the fact that the Yuzu Vanilla Flavor is too perfumey and seems artificial, in addition to the flavor, vanilla flavor is not categorized as an immune booster. The majority of the participants stated that the yogurt sweetness does not represent immunity, whereas several participants stated that the immune system is more related to traditional drinks.

Table 6. Panelist Description of each Flavor Profile

Flavor	Description
Cranberry	has Less Flavor, Good taste but basic, Aroma less pronounced and less in character
Yuzu Vanilla	Too Perfumey, Has a weird aftertaste, and Seems too artificial
Mango Kiwi	Kiwi is too weak and the mango aroma is different from the taste

There are several causes that make the yogurt flavor disliked by the panelist, For the Cranberry, the flavor is nice but too simple and lacks aromatic. On the other hand, Yuzu Vanilla has a very strong aroma, which causes the yogurt too perfumey and has a bad aftertaste. Finally, Mango Kiwi has a very strong mango flavor causing it to overpower the kiwi flavor. Thus, the characteristic of the flavor becomes green mango rather than the balance of those two.

C. Conclusion and recommendation

The conclusion should fulfill the following criteria:

In conclusion, cranberry taste fits most of all parameters, which causes the highest score among the other flavor. However, due to the lack of high notes, the aroma of cranberry is suppressed rather than Mango Kiwi, and Yuzu Vanilla. On the other hand, Mango Kiwi has the most score in terms of Aroma and Aftertaste, it is due that the panelist has been familiar with the flavor before, hence, they tend to give a higher score. Moreover, Yuzu flavors are

concentrated, hence, they give an artificial perfumey note and dissatisfaction aftertaste. In spite of that, the majority of the panelist state the drink doesn't describe immunity, which is caused by artificial flavor and lack of acidity. Moreover, flavor such as cranberry is unfamiliar in Indonesian society which alters their perception of immunity.

Due to time and panelist limitation, this research could not be done fully, In Further Research the author will add color to improve the look of the yogurt and balanced the flavor, hence the flavor are not too overpowering or too weak. Since the sugar content also high, the author will develop the healthier choice prototype for the immune booster yogurt.

IV. SELF REFLECTION

During the Internship, I learn both soft-skill and hard skills, one of the most important skills that are gained is critical thinking skills where any kind of problem that is faced should be responded to quickly. Communication skills between teams are also important to reduce the risk of getting mistakes. Nonetheless, organizational skills are very important when coming to professional work, since there will be a lot of projects and packed deadlines, time management skills are being tested. Working Environment at IFF is very comfortable, all of the workers are friendly and treated the intern like family. However, the pressure is categorized as high since all of the deadlines are quite packed between the project. Where the regular working hours should be 9 hours, but due to the packed schedule, regularly it is in the range of 10 - 12 hours with a 1-hour break, The schedule is more packed when the project includes a homogenizer and UHT process, since it requires a lot of base and time consuming to start and clean the machines.

Regardless of the soft skill, during the Internship, the author also learned a lot of lab skills which are the basics that have been taught in i3L. However, in professional work the method will be different since there will be a particular result that is wanted by the customer and the method is repeated more often rather than in a university lab. Due to the repetition of the method, the author also got used to machineries such as UHT and Homogenizer. During the Internship, every method are being told from how to start the machines, running, and finally cleaning. Even though it is difficult to picture during theory, i3L gives the opportunity to explain the function and the lab apparatus that are suitable for certain food analyses. Moreover, i3L gives additional learning through BRIGHT sessions and Power talks to give an insight into modern technology that is relatable to the author's interest. i3L lab gives the most contributor since it is complete with most of the recent laboratory technology.

Nonetheless, the author gains knowledge regarding the flow process of food trials, Since there are a lot of stabilizer types, the author needs to gain a reference from the mentor regarding the type of beverages that will be formed and mouthfeel characteristics. Furthermore, pre-heating the products is necessary, however, the temperature will be varied according to the stabilizer type. Since the author focus on dairy and plant-based product, Ice-cream making machine, UHT, and Homogenizer are commonly used to improve the quality of dairy products. At IFF, the students are taught step-by-step how to run machines and how to clean them. In addition, the author not only learns about laboratory techniques, but also learns company software and knows the characteristics of each flavor, and also learns soft skills such as organizing and packing samples.

Theories that have been learned throughout these past three years have also been highly effective, especially for food processing, food analysis, food additives, and food sensory. Where it helps the author to easily understand to make the sample prototype. However, a lot of things could not be found in universities, such as agility and initiative to finish the project. Moreover, food technology are fastly adapted to improve sensory profile which in universities only been taught regarding the basic theory in the company there are a lot of flavor technology that has not been known before.

V. CONCLUSION & RECOMMENDATION

Conclusion

During the internship period soft skills and hard skills are well developed and trained to face the professional area. Where i3L gives huge benefits for us to prepare it. The institute serves us with sophisticated apparatus for understanding science. In spite of that, i3L lecturers give us the ability to sharpen our critical thinking skill rather than just giving us the theory. Hence, the author could adapt into the professional world. Furthermore by having a chance to do an internship at IFF expand my knowledge in terms of product development. Moreover, Sensory Analysis has also been taught to a certain extent. Hence, this internship introduces to the author and must be ready for the next step after graduation.

Recommendation

There is still a lot more to learn during this internship, by making the Internship report deadline before the internship is done causes the author to have a divided focus between doing an internship and doing the report. Furthermore, giving a clear guideline and mission to do will make the assignment easier and track

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APPENDICES

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Aroma	Based on Mean	.460	2	135	.632
	Based on Median	.290	2	135	.749
	Based on Median and with adjusted df	.290	2	131.554	.749
	Based on trimmed mean	.417	2	135	.660
Sourness	Based on Mean	1.592	2	135	.207
	Based on Median	1.182	2	135	.310
	Based on Median and with adjusted df	1.182	2	134.623	.310
	Based on trimmed mean	1.676	2	135	.191
Sweetness	Based on Mean	2.076	2	135	.129
	Based on Median	1.828	2	135	.165
	Based on Median and with adjusted df	1.828	2	127.902	.165
	Based on trimmed mean	1.793	2	135	.170
Flavor	Based on Mean	1.284	2	135	.280
	Based on Median	1.500	2	135	.227
	Based on Median and with adjusted df	1.500	2	128.003	.227
	Based on trimmed mean	1.413	2	135	.247
Texture	Based on Mean	1.721	2	135	.183
	Based on Median	.915	2	135	.403
	Based on Median and with adjusted df	.915	2	126.116	.403
	Based on trimmed mean	1.343	2	135	.265
Mouthfeel	Based on Mean	1.077	2	135	.343
	Based on Median	.664	2	135	.516
	Based on Median and with adjusted df	.664	2	134.172	.516
	Based on trimmed mean	.859	2	135	.426
Creaminess	Based on Mean	.662	2	135	.518
	Based on Median	1.117	2	135	.330
	Based on Median and with adjusted df	1.117	2	124.534	.331
	Based on trimmed mean	.816	2	135	.444
Aftertaste	Based on Mean	.081	2	135	.923
	Based on Median	.008	2	135	.992
	Based on Median and with adjusted df	.008	2	129.241	.992
	Based on trimmed mean	.065	2	135	.937
Overall.Liking	Based on Mean	1.530	2	135	.220
	Based on Median	1.358	2	135	.261
	Based on Median and with adjusted df	1.358	2	127.757	.261
	Based on trimmed mean	1.367	2	135	.258

Appendix 1. Homogeneity results of Hedonic Test

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Aroma	Between Groups	6.797	2	3.399	2.519	.084
	Within Groups	182.109	135	1.349		
	Total	188.906	137			
Sweetness	Between Groups	1.058	2	.529	.365	.695
	Within Groups	195.848	135	1.451		
	Total	196.906	137			
Sourness	Between Groups	2.841	2	1.420	.836	.436
	Within Groups	229.283	135	1.698		
	Total	232.123	137			
Texture	Between Groups	4.101	2	2.051	1.470	.234
	Within Groups	188.391	135	1.395		
	Total	192.493	137			
Flavor	Between Groups	3.145	2	1.572	.828	.439
	Within Groups	256.391	135	1.899		
	Total	259.536	137			
Mouthfeel	Between Groups	2.783	2	1.391	.744	.477
	Within Groups	252.587	135	1.871		
	Total	255.370	137			
Creaminess	Between Groups	2.188	2	1.094	.738	.480
	Within Groups	200.217	135	1.483		
	Total	202.406	137			
Aftertaste	Between Groups	6.884	2	3.442	1.777	.173
	Within Groups	261.435	135	1.937		
	Total	268.319	137			
Overall Liking	Between Groups	6.797	2	3.399	1.919	.151
	Within Groups	239.087	135	1.771		
	Total	245.884	137			

Appendix 2. One-Way ANOVA Results towards Hedonic Test

	Sample A	Sample B	Sample C
<i>Cranberry</i>	0.14	-	-
<i>Yuzu</i>	-	0.02	-
<i>Vanilla</i>	-	0.05	-
<i>Mango</i>	-	-	0.1
<i>Kiwi</i>	-	-	0.14

Appendix 3. Concentration Formula of Immune Booster Yogurt

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INTERNSHIP REPORT

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