

**SENSORY EVALUATION ON THE DIFFERENT LEVEL OF FIDDLEHEAD  
FERN (*Diplazium esculentum*) IN ICE CREAM MAKING**

**College of Technology and Allied Sciences  
BOHOL ISLAND STATE UNIVERSITY  
Zamora, Bilar, Bohol**

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**June 2021**

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THE DIFFERENT LEVEL IN ICE CREAM MAKING**

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**A Thesis  
Presented to the Faculty of the  
College of Technology and Allied Sciences  
BOHOL ISLAND STATE UNIVERSITY  
Zamora, Bilar, Bohol**

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**In Partial Fulfilment  
Of the requirement for the  
Bachelor in Science and Industrial Technology  
Major in Food Preparation Service Management**

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**Cabanlit, Jerwin O.  
Jumawid, Cristel Jane D.  
Palingcod, Jomar T.  
Simbajon, Ruby**

**June 2021**

## APPROVAL SHEET


The research study entitled "SENSORY EVALUATION ON THE DIFFERENT LEVEL OF FIDDLEHEAD FERN (*Diplazium esculentum*) IN ICE CREAM MAKING" prepared and submitted by Jerwin O. Cabanlit, Cristel Jane D. Jumawid, Jomar T. Palingcod and Ruby Simbajon in Partial fulfillment of the requirements for the degree of Bachelor of Science in Industrial Technology major in Food Preparation Service Management has been examined and recommended for acceptance and approval for oral defense.


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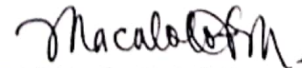
  
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**Jerwin, Cristel Jane, Jomar and Ruby**

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## ABSTRACT

The study was conducted at the Poblacion Vieja in the Municipality of Batuan Bohol specifically at Jumawid Residence for the processing of fiddlehead fern ice cream. A study conducted to determine the sensory evaluation and on the different level of Fiddlehead Head fern in Ice Cream Making. Specifically, the study intended to find out the profile of the respondents in terms of age, gender, civil status and educational attainment; the sensory evaluation on the different level of fiddlehead fern in ice cream making in terms of appearance, aroma, taste and texture; the different of fiddlehead fern ice cream with visual quality evaluation; and the significance difference among the treatments. Based on the result of the study, the researchers use the descriptive sensory evaluation during the product testing. There were forty respondents; three senior high students, five college students, five college level, one Ph. D. and two MA Graduate. Most of the respondents were female, 18-27 years old, college level and college graduate. Most of them says that treatment one is the most acceptable treatments will because soft within 30 days. Based on the conclusions made, the researcher recommends the following: the instructor who are handling food related subjects are encouraged to utilize the technology guide in the students activities and practicum in making desserts like ice cream, as well BSIT-FPSM and BS Entrepreneurship courses are encouraged to utilize fiddlehead fern ice cream for income generating projects after the enhancement of its attributes and future researchers may test the national content of the Fiddlehead Fern Ice Cream that could be used in making product packaging and may also conduct related studies to develop and produce pore products utilizing the Fiddlehead Fern and other abundant resources in the locality.

## Chapter 1

### THE PROBLEM AND ITS SCOPE

#### Rationale

The Philippines is fortunate to have rich soil and some hectares of forest that are home several indigenous species of flora and fauna. Among these species are fruits and vegetables that have become part of the culture of several areas in the country since these have become part of their diet and consumptions

Indigenous vegetables have since become an important part of our culture and cuisine. Some dishes or traditional remedies may not be the same without these ingredients which is why indigenous crops need to be preserved so that the next generation will know them just as we and our elders.

Among the indigenous plant known as fiddlehead fern or pako is an fern that eaten as a vegetables. It grows well in shaded areas with little disturbance and lots of water such as riversides, edges of forest, and waterways. The edible indigenous fern can be prepared in traditional way such as steamed, mixed in a salad, sautéed with garlic and onion, or cooked with coconut milk (gata). The availability of pako vegetable in the locality is considered by the researchers as a strong point utilizing it in making new products like snacks particularly ice cream.

Ice cream was considered to be an indulgent category food in the past; it has now developed to a stage where it is favorably perceived as a snacking

alternative. However, its nutritional value remained low. In fact, it placed among the 10 delicious but unhealthy foods that many of us enjoyed (Carg, 2018). On the contrary, these days the numbers of health conscious consumer is continuously growing (Waterhouse, 2013). The influence brought by the latest trend of health and wellness engagement is causing the people to choose healthy foods sustainable living.

Therefore, by maximizing the usage and abundance of pako vegetables a new variety of ice cream flavor can be made somehow respond to the needs of the consumers. Moreover, the addition of pako vegetables in making ice cream may enhance if not uplift the therapeutic value of the ice cream.

With the aforementioned cases, the researchers wanted to create a new flavor of ice cream in order to prove there are a lot of ways on how to utilize what the nature provides. The researchers that believe that through innovation, creation of new things is possible. They hope that this research will turn out successful and would cost lesser and provide more nutrient to the consumers.

## Literature Background

Article II, Section 15 of the 1987 Philippines Constitution states that the shall protect and promote the right to health of the people and instill health consciousness among them. This includes the adoption of an integrated and comprehensive approach to health development which shall endeavor to make essential goods, health and other social services available to all people at affordable cost.

Thus, government agencies such as Food and Drugs Association (FDA), Department of Health (DOH) and Department of Trade and Industry (DTI) collaborate with each other in ensuring that what the Filipinos are consuming must be safe as well as disseminating valuable information about health across the archipelago. In line with it is Recommended Energy and Nutrient Intake (RENI) that is observed by manufacturers in the production of goods. The FDA also has been very particular on the product manufacturers to which it includes safety practices and sanitation during, before and after manufacturing.

Also, Section 4 of the Article 14 of the 1987 Philippines Constitution declared that is policy of the State to promote scientific and technological research and development, foster invention and utilize scientific knowledge as an effective instrument for the national progress.

In line with this, Filipinos have gone a long way to the adaptation of the digital world. In various fields, expertise has been one good factor towards

globalization. Today demands for invention and discovery is high due to the advent of technology.

Every invention comes from the idea of responding to the demand of the people, making life easy and quick.

Article XIV, Republic Act-11293 known as "Philippine Innovation Act" was enacted in order to foster innovation in the country as a vital component of national development and sustainable economic growth. Recognize sciences and technology as "essential for national development and progress" and gives priority "research and development, invention, innovation and their utilization", state recognize the value of sources of innovation that are unique to the country, such as traditional knowledge, traditional cultural expressions, and genetic resources, and shall strive to promote their potentials for innovation while protecting them from misappropriation. In these rules, misappropriation includes misuse or exploitation.

Republic Act- 10557, an act promoting and strengthening Filipino design, providing for the purpose a national design policy and renaming the product development and design center of the Philippines in to the design center of the Philippines and for other the purposes. State that to enhance competitiveness and innovation of Philippines products, create market-responsive design services, while advocating for economic and environmental sustainability. The State shall also endeavor to promote an economy and society driven by design and creativity responsive to our fast-changing times and reflective of the Filipino

culture and identity, while concurrently advocating the protection of intellectual property rights to these ideas and innovations.

Republic Act-7355, an act "Manlilikha ng Bayan" they provide us with a vision of ourselves and of our nation, a vision we might be able to realize someday, once we are given the opportunity to be true to ourselves as these artist have remained truthful to their act. The state shall mean a citizen engaged in any traditional art uniquely Filipino, whose distinctive skills have reached such a high level of technical and artistic excellence and have been passed on to and widely practiced by the present generation in his/her community with the same degree of technical and artistic competence.

Republic Act- 10601 an act " Improving the Agriculture and Fisheries Sector through Mechanization" covers research, development, and extension (RDE), promotion, distribution, supply, assembling, manufacturing, regulation, use, operation, maintenance and project implementation of agricultural and fisheries machinery and equipment (Section 4), support the establishment of quality, safety and performance testing centers for the certification of agricultural and fisheries machinery in strategic localities in the country.

Republic Act- 10816 an act " Providing For the Development and Promotion of Farm Tourism in the Philippines" covers further recognizes that tourism, coupled with agriculture extension services, can disseminate the value of agriculture in the economic and cultural development of the country, serve as a catalyst for the development of agriculture and fishery communities, and

provide additional income for farmers, farmworkers and fisher folk, to maximize the benefits that can be derived from agriculture and tourism combined, it is therefore the declared policy of the state to provide the policy and enabling environment and promotion of farm tourism in the country.

Republic Act- 9501 an act to "Promote Entrepreneurship by Strengthening Development and Assistance Programs to Micro, Small and Medium Scale Enterprises, state shall complementing and supplementing financing programs for MSMEs and doing away with stringent and burdensome collateral requirements that small entrepreneurs invariably find extreme difficulty complying with and shall undertake to promote entrepreneurship, support entrepreneurs, encourage the establishment of MSMEs and ensure their continuing viability and growth and thereby attain countryside industrialization.

Particularly, ice cream is one among the various food that has brought satisfaction not only to children but also to adults and elders. It is important dairy products produced with milk, cream, water, fruits, flavoring ingredients and others. The quality, characteristics, ingredient, sensory practices and temperature greatly affects the acceptability of the ice cream.

Ice cream is a frozen dessert made from dairy products such as milk and cream combined with flavorings and sweeteners such as sugar. In some cases, artificial flavorings and colorings are added instead of natural ingredients. It is considered to be junk food which is high in sugar and fats, the less they like fresh and natural foods like fruit and vegetables.

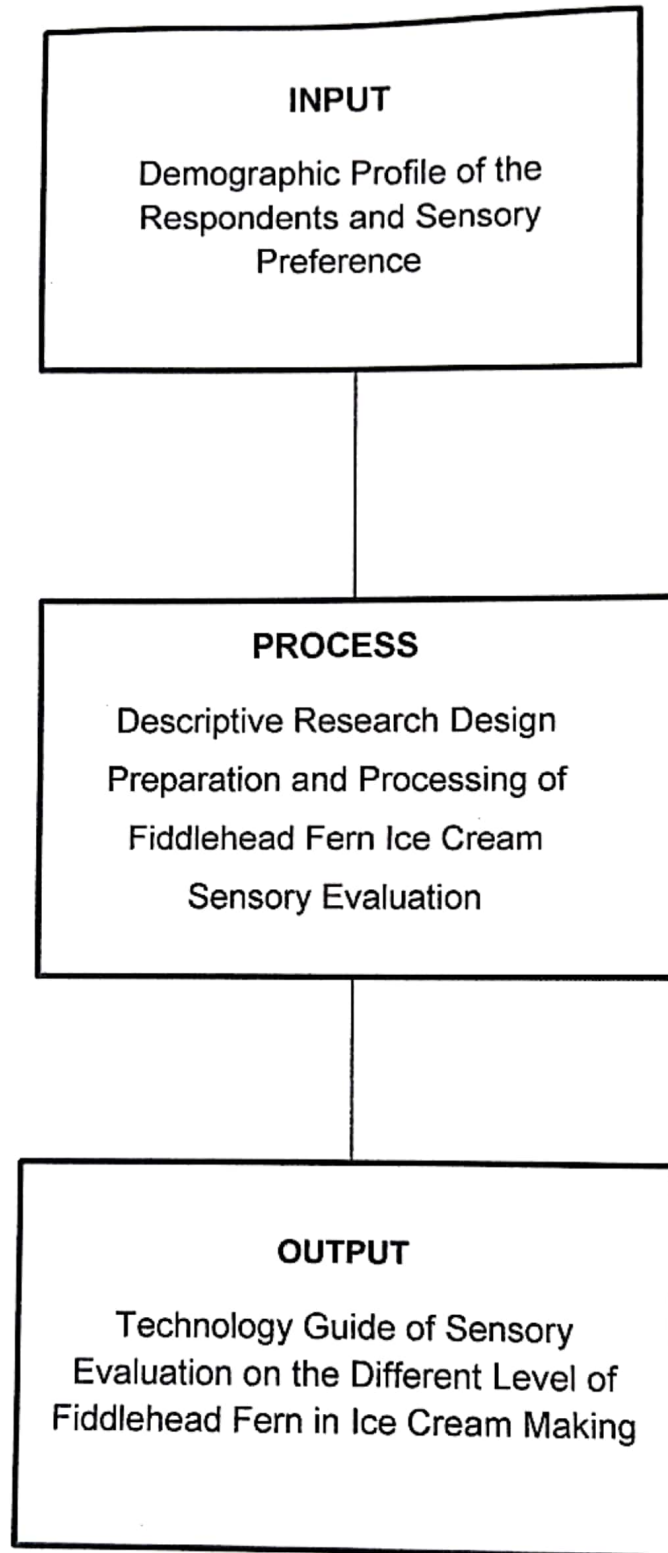


Figure 1. Flow of the Study

## Statement of the Problem

The main purpose of the study was to determine the sensory evaluation on the different level of fiddlehead fern in ice cream making as an alternative dessert. The study was conducted at Municipality of Batuan S.Y. 2020-2021.

Specifically, the study aimed to answer the following questions:

1. What is the demographic profile of the respondents of the sensory evaluation on the different level of fiddlehead fern in ice cream making in terms of:
  - 1.1 age;
  - 1.2 gender;
  - 1.3 civil status; and
  - 1.4 educational attainment?
2. What is the sensory preference of sensory evaluation on the different level of fiddlehead fern in ice cream making in different treatments in terms of:
  - 2.1 appearance;
  - 2.2 aroma;
  - 2.3 taste; and
  - 2.4 texture?
3. What is the visual quality evaluation of the most acceptable treatment?
4. Is there a significant difference among the treatments of Fiddlehead Fern Ice Cream in terms of appearance, aroma, taste and texture?

## **Null Hypothesis**

There is no significant difference in the acceptability level among the three treatments in terms of appearance, aroma, taste and texture.

## **Significance of the Study**

In pursuing this study, the researchers believed that this would benefit the following:

**Entrepreneurs.** The result of the study would help small scale business to consider low-cost products with high nutritional to promote health and wellness among consumers and to augment income. Also it can help in making dessert and enhancing nutritive content of the products, ensuring little amount of money for the main ingredients.

**Community.** The success of this undertaking would gear knowledge among the people living in the community to preserve and protect our resources.

**Student.** The students would encourage to discover new foods out from the ingredients that are available in their locally or community.

**Food Technology Instructor.** The development of techno-guide would create another breakthrough in making another taste for ice cream. Hence, it would guide teachers to encourage students to pursue this kind of innovation.

**Future Researchers.** This study would benefit the future researcher who wants to pursue similar study.

## RESEARCH METHODOLOGY

The researcher utilized an experimental research design. The researcher wanted to see if there were any changes between the treatments utilizing fiddlehead fern or pako plants.

### Design

The study utilized Complete Randomized Design method of generating the data. The respondents were made to answer a sensory evaluation tool to ascertain their sensory preference as to appearance, aroma, taste and texture of fiddlehead fern ice cream with the following replication and treatment.

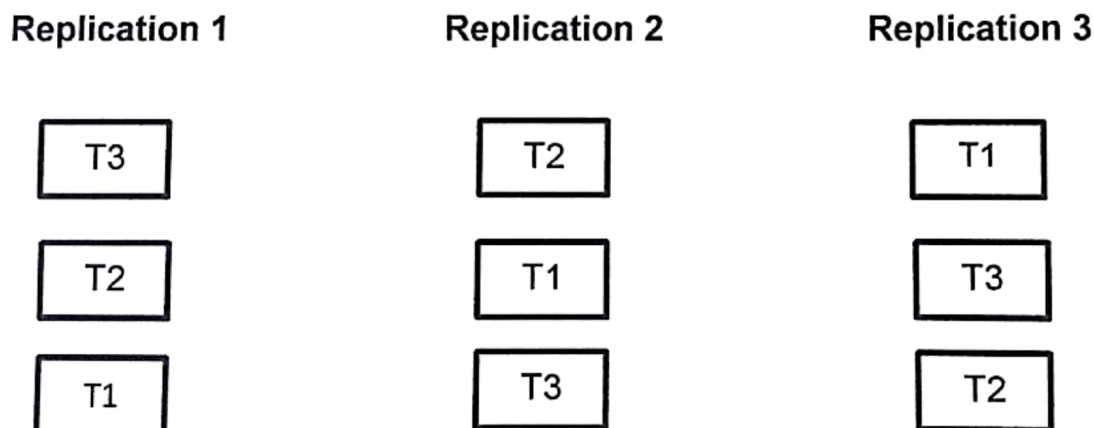


Figure 2. Shows the experimental lay out using CRD

Legend;

T1 – ½ cup blanched fern + 2 cups cream + 1 cup condense + 1 teaspoon powdered ginger + 1 tablespoon honey + ½ teaspoon salt

T2 – 1 cup blanched fern + 2 cups cream + 1 cup condense + 1 teaspoon powdered ginger + 1 tablespoon honey + ½ teaspoon salt

T3 – 1 ½ cup blanched fern + 2 cups cream + 1 cup condense + 1 teaspoon powdered ginger + 1 tablespoon honey + ½ teaspoon salt



The respondents answered the questionnaire by checking the box that corresponds their chosen number as: 1(Extreme Dislike), 2 (Dislike), 3 (Like Slightly), 4 (Like Moderate) and 5 (Like Very Much) to determine the attributes such as aroma, texture, color and taste of the sensory evaluation on the different level of fiddlehead fern in ice cream making.

## **Procedures**

**Obtaining a Permission from the college.** The researchers secured the approval from the Campus Director of the University with the recommendation from the dean of the College for the conduct of the study.

**Procurement of Ingredients.** Fiddlehead Fern were procured and harvested in Barangay Poblacion Norte, Batuan, Bohol and the other ingredients were purchased in the public market for convenience.

**Gathering and Assembling of Materials and Equipment.** In the preparation of fiddlehead fern ice cream in various treatments, ingredients, procedure and tools were used. The tools and equipment used in this study were measuring spoon and cups, spoon and forks, knife, saucepan, ladle, mixing bowl, strainer, blender, electric mixer, refrigerator.

**Procedure in Making Fiddlehead Fern Ice Cream.** In the preparation of fiddlehead fern ice cream, wash and cut the fern into small pieces and blanch it for two-three minutes over medium heat. Blend the blanched fern until paste like consistency and set aside. In a bowl, whip the cream and slowly add the honey.

In a separate bowl, mix the blended fern together with the condensed milk, powdered ginger and salt. Gently add the fern mixture into the cream and honey mixture until well combined. Place the mixture in an airtight container and place it in the freezer.

### **Data Gathering Procedure**

The researchers set up the three treatments in a specified area around one to two meters away from the respondents, with the bottle of water, questionnaire papers, and pencils. With the directions and adhering to strict health protocol and implementation were given to the respondents and given ample time to task and analyze each treatment must be follow.

### **Visual Quality Evaluation**

The researchers stored the product in a freezer with a temperature of -18°C for thirty days. The visual observation was done every day to determine whether the product become spoiled, damage and stay the same across the three different treatments.

### **Statistical Treatment**

The data gathered was carefully tallied, tabulated, analysed, computed and interpreted using. Complete Randomized Design (CRD) to determine the significant difference among treatments for the purpose of presentation and analysis.

### Formula for the One-way ANOVA

$$F = \frac{MS_{\text{between}}}{MS_{\text{within}}}$$

One Way ANOVA: The one-way Analysis of Variance (ANOVA) was used to determine whether there are significant differences between the means of two or more independent (unrelated) groups (although you tend to only see it used when there are a minimum of three, rather than two group).

The computed weighted mean was described using the following scale.

4.20-5.00- Like Very Much (LVM)

3.40-4.19- Like Moderate (LM)

2.60-3.39- Like Slightly (LS)

1.80-2.59- Dislike (DS)

1.00-1.79- Extremely Dislike (EDS)

## OPERATIONAL DEFINITION OF TERMS

To fully understand, the following terms were defined operationally.

**Appearance.** It is the physical quality of fiddlehead fern ice cream in three treatments.

**Aroma.** It is noticeable smell of the product between three treatments.

**Fiddlehead Fern.** Indigenous vegetables plants which sprout a shoot at the tip of the plant that is harvested.

**Hedonic Scale.** It Refers to the design use to measure the acceptability level of the product with four descriptive rating namely: (5) Like Very Much (4) Like Moderate (3) Like Slightly (2) Dislike (1) Extremely Dislike.

**Taste.** It refers to the sweetness, bitterness, sourness or saltiness of fiddlehead fern ice cream.

**Technology Guide.** It is the reference material that contains the ingredients, procedure, tools and equipment in making the fiddlehead fern ice cream.

**Texture.** It is the smoothness and creaminess of fiddlehead fern flavored ice cream.

## Chapter 2

### PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

The chapter deals with the presentation, analysis and interpretation of the data collected through the questionnaire answered by the 40 respondents of the Batuananon people. The table illustrates the responses on the problem of the study which determine the profile of respondents in terms of age, gender, civil status and educational attainment. The Sensory Evaluation on the Different Level of Fiddlehead Fern Ice Cream Making, and the difference in the acceptability level in terms of appearance, aroma, taste and texture. The study was conducted in the Municipality of Batuan with the use of sensory evaluation questionnaire, with the aid of 5 hedonic scale.

#### PROFILE OF THE RESPONDENTS

Table 1 shows the demographic profile of the respondents in terms of age, sex, civil status, educational attainment and occupation. Majority of the respondents were in the age of 30 (75%) belongs to 18-27 age bracket lowest belongs to the 68-77 age bracket with 1 (2.5%) were males and 27 (67.5%) females. As to the gender, there were 27 (67.5%) females and 13 (32.5%) males. Thirty-one 31 (77.5%) of the respondents were single and only 9 (22.5%) were married. With regards to the educational attainment, college level got the highest percentage with 29 (72.5%). This implies that the majority of the responses were students, identified as respondent of the study.

**Table 1**  
**Demographic Profile of the Respondents in terms of age, gender,**  
**civil status and educational attainment**

n=40

	Items	Frequency(F)	Percent(%)
<b>Age</b>	18-27	30	75
	28-37	6	15
	38-47	3	7.5
	48-57	0	0
	58-67	0	0
	68-77	1	2.5
	<b>Total</b>	<b>40</b>	<b>100%</b>
<b>Gender</b>	Female	27	67.5
	Male	13	32.5
	<b>Total</b>	<b>40</b>	<b>100%</b>
<b>Civil Status</b>	Single	31	77.5
	Married	9	22.5
	<b>Total</b>	<b>40</b>	<b>100%</b>
<b>Educational Attainment</b>	Senior High Student	3	7.5
	College Graduated	5	12.5
	College Level	29	72.5
	Ph. D.	1	2.5
	MA Graduate	2	5
	<b>Total</b>	<b>40</b>	<b>100%</b>

Table 2 reveals the sensory evaluation on the different level of fiddlehead fern in ice cream making. It shows that the appearance, aroma, taste, and texture of treatment 1 (pako blanched) got the highest mean 4.64 which described as 'Like Very Much'.

According to Brown (2005) when people choose a particular food, they evaluate it consciously, primarily on how it looks, smell, tastes and feels. These sensory factors are more likely considered in assessing food products.

The first criterion included in the observation guide is the appearance. It was shown that in terms of the appearance, Treatment 1 with  $\frac{1}{2}$  cup of fiddlehead fern blanched got the highest weighted mean scale 4.71 described as 'like very much' whereas Treatment 3 with  $1 \frac{1}{2}$  cup of fiddlehead fern got the lowest weighted mean scale 4.46 which is still described as 'like very much'. The fineness of the extract made the ice cream appear pleasantly in greenish color compared to fiddlehead fern because latter contributed unnecessary particles that made the ice cream unattractive. However. The three treatments still lie on the margin of 'Like Very Much'

The second criterion is the aroma, it was derived that Treatment 2 with 1 cup of fiddlehead fern got the highest weighted mean of 4.48 among the treatments and was described as 'Like Very Much'.

The third criterion is the taste, in terms of taste; Treatment 1 with 1 cup of fiddlehead fern still dominated the two remaining treatments with the weighted mean 4.76 described as 'like very much'. Here treatment 3 with  $1 \frac{1}{2}$  cup of fiddlehead fern got the lowest weighted mean scale 4.31 as 'Like Very much'. This implies that the evaluators preferred the smooth and fine taste of the ice cream.

The last criterion included is the texture; Treatment 1 with  $\frac{1}{2}$  cup of fiddlehead fern got the highest weighted mean scale of 4.76 described as 'Like Very Much'.

Overall refers to the sum total score of the product in terms of appearance, aroma, taste and texture. This will determine the respondents sum up preference of the three treatments.

Moreover, Treatment 1 with  $\frac{1}{2}$  cup blanched fiddlehead fern got the overall rating of 'like very much' with the highest weighted mean of 4.64. However, Treatment 2 with 1 cup of blanched fiddlehead- fern still got the rating of 'like very much' but has only weighted mean of 4.50 which is 0.14 less than the Treatment 1. On the other side, Treatment 3 with  $1 \frac{1}{2}$  cup of blanched fiddlehead- fern got the lowest weighted mean of 4.35 which is described as 'like very much'. This could mean that Treatment 1 is the most acceptable treatment for the ice cream, followed by Treatment 2 and Treatment 3 respectively.

Sensory preference of sensory evaluation on the different level of fiddlehead fern in ice cream making different treatments terms of appearance, aroma, taste and texture.

**Table 2**

**Sensory Evaluation on the Different Level of Fiddlehead Fern in Ice Cream Making in terms of Appearance, Aroma, Taste and Texture**

Sensory Attributes	T1		T2		T3	
	WM	Description	WM	Description	WM	Description
<b>Appearance</b>	4.71	Like Very Much	4.60	Like Very Much	4.46	Like Very Much
<b>Aroma</b>	4.36	Like Very Much	4.48	Like Very Much	4.39	Like Very Much
<b>Taste</b>	4.76	Like Very Much	4.50	Like Very Much	4.31	Like Very Much
<b>Texture</b>	4.76	Like Very Much	4.44	Like Very Much	4.24	Like Very Much
<b>Overall Sensory</b>	4.64	Like Very Much	4.50	Like Very Much	4.35	Like Very Much

INDICATORS: Range

Description

4.20 – 5.00

- Like Very Much (LVM)

3.40 – 4.19

- Like Moderate (LM)

2.60 – 3.39

- Like Slightly (LS)

1.80 – 2.59

- Dislike (DS)

1.00 -1.79

- Extremely Dislike (EDS)

Table 3 shows the visual quality evaluation of fiddlehead fern ice cream. It reveals that T1 with ½ cup blanched fern + 2 cup cream + 1 cup condense + 1 teaspoon powder ginger + 1 tablespoon honey + ½ teaspoon salt had the highest weighted mean scale with 4.76 with descriptive interpretation of “ Like Very Much”

Table 3

Visual Quality Evaluation of Fiddlehead Fern in Ice Cream Making  
Freezing Temperature

Days	T1
1	No Changes
2	No Changes
3	No Changes
4	No Changes
5	No Changes
6	No Changes
7	No Changes
8	No Changes
9	No Changes
10	No Changes
11	No Changes
12	No Changes
13	No Changes
14	No Changes
15	No Changes
16	No Changes
17	No Changes
18	No Changes
19	No Changes
20	No Changes
21	No Changes
22	No Changes
23	No Changes
24	No Changes
25	No Changes
26	No Changes
27	No Changes
28	No Changes
29	No Changes
30	No Changes

The comparison between paired treatments is needed to provide the specific information on which means are significant by different from each other. The Post hoc analysis is the analysis of variance was the test being employed in order to determine honestly significant difference (HSD) among paired treatments in terms of appearance, aroma, taste, texture and General Acceptability. The mean difference is compared to the computed honestly significant difference in order to identify the description that will give us decision.

Table 4 shows that paired treatments for appearance (T1 vs. T2) has the p- value 0.0415564, (T1 vs. T3) has the p-value of 0.002442, (T2 vs. T3) has the p- value of 0.0046347.

Aroma (T1 vs. T2) has the p- value of 0.1469545, (T1 vs. T3) has the p- value of 0.7596295, (T2 vs. T3) has the p- value of 0.2695499.

Taste (T1 vs. T2) has the p- value of 0.1469545, (T1 vs. T3) has the p- value of 0.7596295, (T2 vs. T3) has the p- value of 0.26954986.

Texture (T1 vs. T2) has the p- value of 6.576E-06, (T1 vs. T3) has the p- value of 3.372E-08, (T2 vs. T3) has the p- value of 0.016288946.

The result below implies that the paired treatments mentioned below have significant differences in the appearance, aroma, taste, texture and overall sensory evaluation on the different level of fiddlehead in ice cream making because of the three treatments. In terms of appearance (T1 vs. T2 & T2 vs. T3), aroma (T1 vs. T3) and texture (T1 vs. T3) has no significant difference in the respondent's preference.

Table 4

**Difference in the Sensory Evaluation fiddlehead fern ice cream in terms of sensory attributes**

Sensory Attributes	Degree of Freedom	Sum of Square	Mean of Square	Observe F	P- value	Description	Interpretation
Appearance	2	1.2638 15	0.63190 75	8.2748314 02	0.0004352 81	Significant	Reject Ho
Aroma	2	0.3023 15	0.15115 75	1.1457939 82	0.3215129 39	Not Significant	Accept Ho
Taste	2	0.3023 15	0.15115 75	12.436839 28	0.3215129 39	Not Significant	Accept Ho
Texture	2	5.4401 86667	2.72009 33	22.657180 94	4.819E-09	Not Significant	Accept Ho
Overall Sensory	2	1.7301 97863	0.86509 89	12.417015 52	1.32223E- 05	Not Significant	Accept Ho

Table 5

Comparison of Post Hoc Analysis result in the Sensory Evaluation on the Different Level of Fiddlehead-Fern in Ice Cream making in three treatments in terms of sensory attributes

**Post Hoc Analysis for Appearance**

Pairing of Treatments	P-Value	Interpretation	Decision
T1 vs. T2	0.0415564	Not Significant	Accept Hypothesis
T1 vs. T3	0.0002442	Significant	Reject Null Hypothesis
T2 vs. T3	0.0046347	Significant	Reject Null Hypothesis

**Post Hoc Analysis for Aroma**

Pairing of Treatments	P-Value	Interpretation	Decision
T1 vs. T2	0.1469545	Not Significant	Accept Hypothesis
T1 vs. T3	0.7596295	Not Significant	Accept Hypothesis
T2 vs. T3	0.2695499	Not Significant	Accept Hypothesis

**Post Hoc Analysis for Taste**

Pairing of Treatments	P-Value	Interpretation	Decision
T1 vs. T2	0.1469545	Not Significant	Accept Hypothesis
T1 vs. T3	0.7596295	Not Significant	Accept Hypothesis
T2 vs. T3	0.26954986	Not Significant	Accept Hypothesis

### Post Hoc Analysis for Texture

Pairing of Treatments	P-Value	Interpretation	Decision
T1 vs. T2	6.576E-06	Significant	Reject Null Hypothesis
T1 vs. T3	3.372E-08	Significant	Reject Null Hypothesis
T2 vs. T3	0.016288946	Significant	Reject Null Hypothesis

### Post Hoc Analysis Overall Sensory

Pairing of Treatments	P-Value	Interpretation	Decision
T1 vs. T2	0.011394737	Significant	Reject Null Hypothesis
T1 vs. T3	5.69832E-06	Significant	Reject Null Hypothesis
T2 vs. T3	0.01084083	Significant	Reject Null Hypothesis

## Chapter 3

### SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter deals with the summary of findings, conclusions and recommendations. The gathered data were analysed and interpreted in the preceding chapter and were summarized herein basis for formulating conclusions and recommendations.

#### Summary of Findings

The main purpose of the study was to determine the sensory evaluation on the different level of fiddlehead fern in ice cream making in terms of appearance, aroma, taste and texture. It also aimed to seek significant difference among the three treatments used.

After thorough and keen analysis on the result of the study, the researchers formulated the following findings.

- 1. Demographic Profile.** Based on the table above, age of 18-27 years old got 75% which was considered as the highest in terms of age. In gender, female got the highest percentage of 67.5%, civil status 77.5% of the respondents were single and educational attainment are the college level which 72.5%
- 2. Sensory Evaluation on the Different Level of Fiddlehead Fern in Ice cream making.** Based on the obtained result. Treatment 1 with  $\frac{1}{2}$  cup blanched fiddlehead-fern got the highest weighted mean in terms

of appearance, aroma, taste and texture interpreted as "Like Very Much".

3. **Visual Quality Evaluation.** It revealed that T1 with  $\frac{1}{2}$  cup of fiddlehead fern added 2 cups of all- purpose cream. 1 cup of condense milk, 1 tablespoon of honey,  $\frac{1}{2}$  teaspoon of salt, 1 teaspoon of ginger powder. The visual quality on observing product within 30 days in freezing temperature, therefore there is no changes of the fiddlehead fern.
4. **Significant difference in the sensory evaluation on the different level of fiddlehead fern ice cream making in different treatments.** It was found out that there was significant difference among the three treatments involved in the study because the p- value is less than 0.05.

## Conclusions

There is a significant difference in the sensory evaluation on the different level of fiddlehead fern in ice cream making in different treatments in terms of appearance, aroma, taste and texture. Moreover, treatment 1 with  $\frac{1}{2}$  cup blanched fiddlehead fern is the most preferable to be used as an ingredient in making the fiddlehead fern ice cream.

## Recommendations

Based on the conclusions drawn from the study, the researchers come up with the following recommendations:

1. The instructors who are handling food related subjects are encouraged to utilize the technology guide in the students' activities and practicum in making desserts like ice cream.
2. The BSIT – FPSM, as well as BS Entrepreneurship courses are encouraged to utilize Fiddlehead Fern Ice Cream for income generating projects after the enhancement of its attributes. The introduction of the product for community consumption will be done as techniques to promote it to the consumers.
3. Future researchers may test the national content of the Fiddlehead Fern ice cream that could be used in making product packaging.
4. Future researchers may conduct related studies to develop and produce more products utilizing the Fiddlehead Fern and other abundant resources in the locality.

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PROPOSED TECHNOLOGY GUIDE IN THE PRODUCTION OF FIDDLEHEAD  
FERN ICE CREAM



Republic of the Philippines  
BOHOL ISLAND STATE UNIVERSITY  
Bilar Campus  
Zamora, Bilar, Bohol



COLLEGE OF TECHNOLOGY AND ALLIED  
SCIENCES  
Department of Hospitality Management and Industrial  
Technology

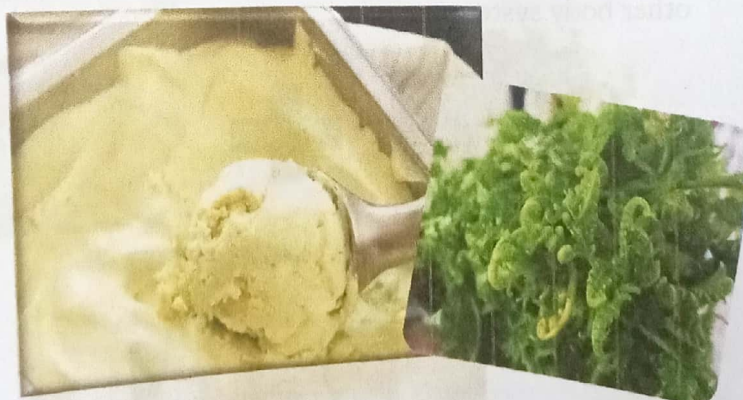
TECHNOLOGY GUIDE

FIDDLEHEAD FERN

*(Diplazium esculentum)*

ICE CREAM

TECHNOLOGY GUIDE



# TECHNOLOGY GUIDE IN THE PRODUCTION OF FIDDLEHEAD FERN ICE CREAM

## Rationale

Indigenous (traditional) vegetables are best defined as species that are locally important for the sustainability of economies, human nutrition and health and social system but which have yet to attain global recognition to the same extent as major vegetables commodities such as tomatoes and cabbage. Given the hundreds of indigenous vegetables consumed worldwide, their accumulated value for mankind is considerable. These species deserve much greater recognition and investment in agricultural research and development than they have presently. Indigenous vegetables are primary candidates for greater use of crop biodiversity in horticulture as they are already consumed and enjoyed locally and can be produced profitably in both rural and urban environments.

Fiddlehead fern, (*Diplazium esculentum*) locally called pako in the Philippines, is a vegetables fern. One of the indigenous vegetables that many Filipinos love to eat. It belongs to family fern. Benefits of fiddlehead fern have calcium- one of the top mineral content of pako, is a mineral which is responsible for the formation of strong bones and teeth, also useful for the proper functioning of heart, nerves, muscles and other body system.



Objective:

1. To develop and produce more products utilizing the fiddlehead fern and other abundant in the locality.
2. To test the nutritional value of fiddlehead fern.
3. To help the entrepreneur to create new ideas for their business.

How Fiddlehead fern Ice Cream varies with the usual ice cream flavour?

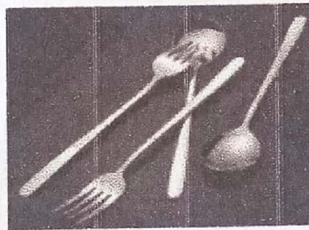
1. It has less fat.
2. It has more nutritive content.

How to make the Fiddlehead Fern Ice Cream?

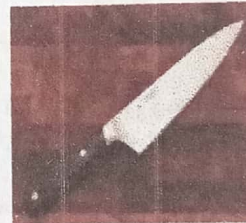
You need these tools and equipment:



Measuring Spoon and Cups



Spoon and Forks



Knife



Saucepan



Ladle



Mixing Bowl



Strainer



Blender



Electric Mixer



Refrigerator

You need the following ingredients:

- 2 cups (500ml) cream
- 1 cup (250ml) condensed milk
- 1 tsp. (5.69 grams) ginger
- 1 tbsp. (14.7ml) honey
- ½ tsp. (2.84 grams) salt

Procedure:

1. Prepare all the needed ingredients, tools, materials and equipment in one table



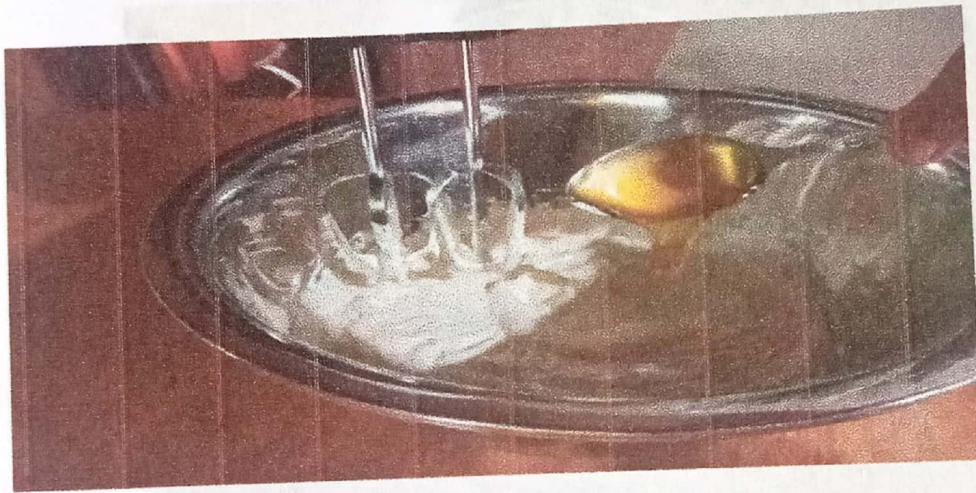
2. Wash Fiddlehead Fern into a clean water and cut in into small pieces. Boil water in a pot, blanch small batches of Fiddlehead Fern at a time. Drain using a strainer, Set aside and let it cool.



3. Blend the blanched fern until paste like consistency.



4. Whip 2 cups of cream and then slowly add 1 tbsp. honey.



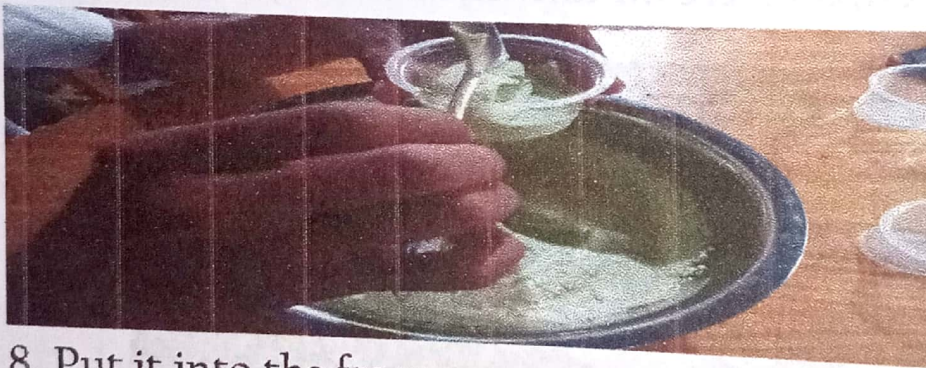
5. In a separate bowl, mix Fiddlehead fern ( $\frac{1}{2}$  cup for T1, 1 cup for T2, 1  $\frac{1}{2}$  cup for T3) 1 cup condensed milk, 1 tsp. powdered ginger,  $\frac{1}{2}$  tsp. salt.



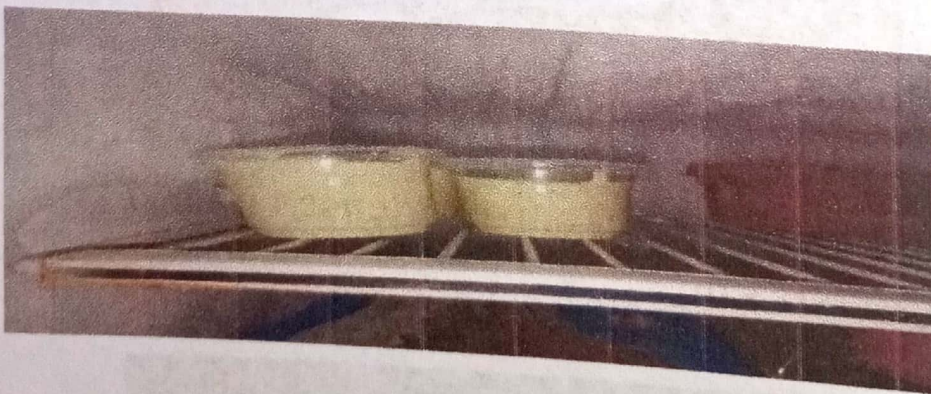
6. Gently add the fern mixture into the cream and honey mixture. Mix until well combined.



7. Put the mixture on a container and label each according to



8, Put it into the freezer.



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**APPENDIX A**  
**Approved Letters**



Republic of the Philippines  
**BOHOL ISLAND STATE UNIVERSITY – Bilar Campus**  
Zamora, Bilar, Bohol



**MARIETTA C. MACALOLOT, Ph. D.**  
Campus Director  
BISU-Bilar Campus

Warm Greetings!

In partial fulfillment of the requirements of Bachelor in Science of Industrial Technology major in Food Preparation Service Management, we the students in the subject Research 2 in the S.Y. 2021-2022 conducted a research entitled "**SENSORY EVALUATION OF FIDDLEHEAD FERN (*Diplazium esculentum*) ON THE DIFFERENT LEVEL IN ICE CREAM MAKING**".

In this regards we would like to ask permissions from your humble office to allow us to distribute and to gather the data necessary in this study. We the researcher assures that these undertakings will follow the health protocols set upon by the university in the distribution and retrieval of the data for safety purposes for both parties.

We would greatly appreciate your consent about this request.

Very truly yours,

(Sgd) **CABANLIT, JERWIN O.**  
(Sgd) **JUMAWID CRISTEL JANE D.**  
(Sgd) **PALINGCOD JOMAR T.**  
(Sgd) **SIMBAJON, RUBY**  
Researchers

Noted by:

(Sgd) **JENEVEB D. ECAT**  
Thesis Adviser

Recommending Approval:

Approved by:

(Sgd) **ARLEN B. GUDMALIN, Ph.D.**  
Dean, CTAS

(Sgd) **MARIETTA C. MACALOLOT, Ph.D.**  
Campus Director



Republic of the Philippines  
BOHOL ISLAND STATE UNIVERSITY  
Bilar campus  
Zamora, Bilar, Bohol



College of Technology and Allied Sciences

Date

Thesis Committee Member

Madam/Sir

The undersigned has the honor to request your approval as member of the committee for the thesis of the undergraduate students of their requirements of the degree BACHELOR OF SCIENCE IN INDUSTRIAL TECHNOLOGY with the specialization of FOOD PREPARATION SERVICE MANAGEMENT.

TITLE

**“SENSORY EVALUATION ON THE DIFFERENT LEVEL OF FIDDLEHEAD FERN IN ICE CREAM MAKING”**

The candidate has been instructed to have consultation with you about the above title. Kindly make the necessary recommendation to have a successful research output.

Thank you for your assistance on this matter.

Very truly yours,

**NELIA Q. CATAYAS, Ph.D.**

Subject Instructor

CONFORM

Name of Faculty

Committee

Signature

1. Jeneveb D. Ecat
2. Herberto Piollo
3. Kevin B. Gasatan
4. John Anthony D. Piollo

- Adviser
- Statistician
- Internal Expert
- Editor

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\_\_\_\_\_

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## APPENDIX B INSTRUMENT



Republic of the Philippines  
BOHOL ISLAND STATE UNIVERSITY  
Bilar campus  
Zamora, Bilar, Bohol  
College of Technology and Allied Sciences



**Vision:** A premier S & T university for the formation of a world class and virtuous human resources for sustainable development in Bohol and the country.

**Mission:** BISU is committed of quality higher education in the arts and sciences, as well as in professional and technological fields; undertake research and development and extension services for sustainable development of Bohol and the country.

### Modified 5 Hedonic Scale on Evaluating The Sensory Evaluation on the different level of Fiddlehead Fern (*Diplazium esculentum*) in Ice cream making

I. Profile of respondent

Age: \_\_\_\_\_ Gender: \_\_\_\_\_ Civil Status: \_\_\_\_\_

Highest Educational Attainment: \_\_\_\_\_

II. Direction: Please read the following items in the table and put the check mark (/). In order to gather information for the study.

#### Treatment No. 1.

Sensory Preference	Like Very much (LVM)	Like Moderate (LM)	Like Slightly (LS)	Dislike (D)	Extremely Dislike (ED)
a. Appearance					
b. Aroma					
c. Taste					
d. Texture					

**Treatment No.2**

Sensory Preference	Like Very much (LVM)	Like Moderate (LM)	Like Slightly (LS)	Dislike (D)	Extremely Dislike (ED)
a. Appearance					
b. Aroma					
c. Taste					
d. Texture					

**Treatment No. 3.**

Sensory Preference	Like Very much (LVM)	Like Moderate (LM)	Like Slightly (LS)	Dislike (D)	Extremely Dislike (ED)
a. Appearance					
b. Aroma					
c. Taste					
d. Texture					

LVM= Like Very Much

LM= Like Much

LS= Like Slightly

D= Dislike

ED= Extremely Dislike

## APPENDIX C

## RAW DATA

n=40

Appearance												
R.N	T1				T2				T3			
	R1	R2	R3	Average	R1	R2	R3	Average	R1	R2	R3	Average
1	5	5	5	5	5	4	4	4.33	5	5	4	4.66
2	5	4	5	4.66	5	5	4	4.66	5	5	5	5
3	5	4	5	4.66	5	4	5	4.66	4	5	5	4.66
4	5	5	5	5	5	5	4	4.66	5	5	5	5
5	5	5	5	5	5	5	4	4.66	4	5	5	4.66
6	5	4	5	4.66	4	4	5	4.33	4	4	5	4.33
7	5	5	5	5	4	5	5	4.66	5	4	5	4.66
8	5	5	5	5	5	5	4	4.66	5	5	4	4.66
9	3	4	4	3.33	5	5	4	4.66	4	5	5	4.66
10	5	5	5	5	5	4	5	4.66	3	4	5	4.66
11	5	5	5	5	4	5	5	4.66	4	5	5	4.66
12	5	5	4	4.66	5	5	4	4.66	4	5	5	4.66
13	5	5	5	5	4	5	5	4.66	5	5	5	5
14	5	5	5	5	5	5	4	4.66	5	5	4	4.66
15	5	5	5	5	5	5	4	4.66	4	5	5	4.66
16	4	5	5	4.33	5	5	5	5	3	5	5	4.33
17	5	5	5	5	5	4	5	4.66	4	4	5	4.33
18	5	5	5	5	5	5	4	4.66	5	5	4	4.66
19	5	5	4	4.66	5	5	5	5	5	5	4	4.66
20	4	5	5	4.66	4	5	4	4.33	4	4	5	4.33

21	5	5	5	5	4	5	5	4.66	4	4	5	4.33
22	4	5	4	4.33	4	5	5	4.66	4	4	5	4.33
23	5	5	4	4.66	5	4	5	4.66	5	4	5	4.66
24	5	5	5	5	4	4	5	4.33	3	4	5	4
25	5	5	4	4.66	4	4	5	4.33	3	5	5	4.33
26	5	5	4	4.66	4	4	5	4.33	4	4	5	4.33
27	5	5	5	5	4	4	5	4.33	3	4	5	4
28	4	5	5	4.66	4	5	5	4.66	3	4	5	4
29	5	5	4	4.66	5	4	5	4.66	4	5	5	4.66
30	5	4	5	4.66	5	4	5	4.66	4	3	5	4
31	5	4	5	4.66	5	5	5	5	4	5	4	4.33
32	5	5	5	5	4	5	5	4.66	4	5	5	4.66
33	4	5	5	4.66	4	5	5	4.66	4	5	4	4.33
34	4	3	5	4	4	4	5	4.33	4	5	4	4.33
35	5	5	4	4.66	5	5	4	4.66	3	5	5	4.33
36	4	5	5	4.66	4	4	5	4.33	4	5	5	4.66
37	4	3	5	4	5	5	4	4.66	5	4	5	4.66
38	5	5	4	4.66	5	5	5	5	3	5	5	4.33
39	4	5	5	4.66	4	4	5	4.33	5	3	5	4.33
40	5	4	5	4.66	4	4	5	4.33	3	4	5	4
<b>TOTAL AVERAGE:</b>				<b>188.53</b>	<b>TOTAL AVERAGE:</b>			<b>184.13</b>	<b>TOTAL AVERAGE:</b>			<b>178.5</b>

Aroma												
R.N	T1				T2				T3			
	R1	R2	R3	Average	R1	R2	R3	Average	R1	R2	R3	Average
1	5	5	4	4.66	5	5	5	5	5	5	5	5
2	5	5	4	4.66	5	5	5	5	5	5	5	5
3	5	3	5	4.33	5	5	5	5	4	5	5	4.66
4	3	5	4	4	3	5	4	4	3	4	5	4.33
5	4	4	3	3.66	4	5	5	4.66	5	5	4	4.66
6	4	5	4	4.33	4	5	5	4.66	5	4	4	4.33
7	4	5	4	4.33	4	5	3	4	4	4	5	4.33
8	3	5	4	4	4	5	5	4.66	3	5	4	4
9	4	4	3	3.66	4	5	5	4.66	3	5	4	4
10	5	5	3	4.33	3	4	5	4	3	4	5	4
11	5	5	4	4.66	5	5	4	4.66	4	5	5	4.66
12	5	5	4	4.66	4	5	5	4.66	4	5	5	4.66
13	5	5	4	4.66	5	5	4	4.66	5	5	5	5
14	5	5	4	4.66	5	5	4	4.66	4	5	5	4.66
15	5	5	3	4.33	5	4	4	4.33	4	5	5	4.66
16	5	5	4	4.66	5	5	5	5	4	5	5	4.66
17	5	5	4	4.66	5	4	5	4.66	4	4	4	4
18	5	5	5	5	5	5	4	4.66	5	5	4	4.66
19	5	5	4	4.66	3	4	4	3.66	5	4	4	4.33
20	5	5	4	4.66	4	5	4	4.33	4	5	4	4.33
21	5	5	3	4.33	4	5	5	4.66	5	4	4	4.33
22	4	5	4	4.33	5	5	4	4.66	4	5	4	4.33
23	4	5	3	4	4	4	5	4.33	5	4	5	4.66

24	5	5	4	4.66	5	4	4	4.33	3	4	4	3.66
25	5	5	4	4.66	3	4	4	3.66	3	5	5	4.33
26	4	5	4	4.33	5	3	5	4.33	4	4	3	3.66
27	4	4	4	4	5	5	4	4.66	4	4	5	4.33
28	5	5	4	4.66	4	4	4	4	3	4	4	3.66
29	5	5	5	5	5	5	5	5	4	4	5	4.33
30	5	4	3	4	5	4	4	4.33	4	3	4	3.66
31	5	4	4	4.33	5	4	4	4.33	4	5	5	4.66
32	4	5	5	4.66	4	5	5	4.66	4	5	4	4.33
33	4	5	5	4.66	4	5	4	4.33	5	5	5	5
34	4	3	5	4	5	4	4	4.33	4	5	5	4.66
35	5	4	4	4.33	5	4	5	4.66	3	5	5	4.33
36	4	4	4	4	4	5	4	4.33	4	4	5	4.33
37	4	4	4	4	5	4	5	4.66	4	5	5	4.66
38	4	5	4	4.33	5	5	5	5	3	5	4	4
39	3	5	3	3.66	4	4	4	4	5	4	5	4.66
40	4	4	4	4	4	4	4	4	3	4	5	4
	<b>TOTAL AVERAGE:</b>			<b>174.51</b>	<b>TOTAL AVERAGE:</b>			<b>179.18</b>	<b>TOTAL AVERAGE:</b>			<b>175.51</b>

Taste												
R.N	T1				T2				T3			
	R1	R2	R3	Average	R1	R2	R3	Average	R1	R2	R3	Average
1	5	5	5	5	5	5	4	4.66	5	4	5	4.66
2	5	4	4	4.33	5	5	5	5	5	5	5	5
3	5	5	5	5	5	3	4	4	4	3	4	3.66
4	5	5	5	5	4	5	5	4.66	3	5	5	4.33
5	5	5	5	5	4	5	5	4.66	4	5	4	4.33
6	5	5	4	4.66	5	4	4	4.33	4	4	5	4.33
7	5	5	5	5	4	4	5	4.33	4	4	4	4
8	5	5	5	5	5	5	4	4.66	4	5	5	4.66
9	3	4	5	4	5	5	5	5	4	5	5	4.66
10	4	5	4	4.33	4	5	5	4.66	3	3	4	3.33
11	5	5	5	5	5	5	5	5	4	5	5	4.66
12	5	5	4	4.66	4	5	5	4.66	4	5	5	4.66
13	5	5	5	5	4	5	4	4.33	4	5	5	4.66
14	5	5	5	5	5	5	5	5	4	5	4	4.33
15	5	5	4	4.66	5	4	5	4.66	4	4	4	4
16	4	5	4	4.33	5	5	5	5	4	5	5	4.66
17	5	5	5	5	5	4	4	4.33	4	4	5	4.33
18	5	5	5	5	5	5	5	5	5	5	4	4.66
19	5	5	4	4.66	4	5	5	4.66	5	4	5	4.66
20	5	5	4	4.66	3	4	4	3.66	5	5	5	5
21	5	5	5	5	3	5	5	4.33	4	4	4	4
22	5	5	5	5	5	5	5	5	5	4	5	4.66
23	5	5	4	4.66	5	4	4	4.33	4	4	4	4

24	5	5	5	5	4	4	5	4.33	4	3	4	3.66
25	5	5	5	5	4	4	4	4	3	4	4	3.66
26	5	5	5	5	4	4	4	4	4	4	4	4
27	5	5	4	4.66	4	3	4	3.66	4	4	4	4
28	5	5	5	5	4	4	4	4	4	4	4	4
29	5	5	5	5	5	5	5	5	3	5	5	4.33
30	5	5	4	4.66	4	4	5	4.33	4	3	4	3.66
31	5	5	5	5	5	5	5	5	5	4	5	4.66
32	5	5	5	5	4	5	4	4.33	4	5	5	4.66
33	5	5	5	5	4	5	5	4.66	5	5	5	5
34	4	5	4	4.33	4	4	4	4	3	4	4	3.66
35	5	4	5	4.66	5	5	5	5	3	4	3	3.33
36	4	5	5	4.66	4	5	5	4.66	5	5	5	5
37	4	4	4	4	5	4	5	4.66	5	5	5	5
38	5	5	5	5	4	5	5	4.66	3	5	5	4.33
39	3	5	5	4.33	4	4	4	4	5	4	5	4.66
40	4	5	4	4.33	3	4	4	3.66	3	4	4	3.66
	<b>TOTAL AVERAGE:</b>			<b>174.51</b>	<b>TOTAL AVERAGE</b>			<b>179.18</b>	<b>TOTAL AVERAGE</b>			<b>175.51</b>

Texture												
R.N	T1				T2				T3			
	R1	R2	R3	Average	R1	R2	R3	Average	R1	R2	R3	Average
1	5	5	5	5	5	4	4	4.33	4	4	4	4
2	5	5	5	5	5	5	5	5	5	5	4	4.66
3	5	4	5	4.66	5	3	4	4	4	4	4	4
4	5	5	5	5	5	5	5	5	3	5	4	4
5	5	5	5	5	4	5	5	4.66	4	5	4	4.33
6	5	5	5	5	4	4	5	4.33	4	4	4	4
7	5	5	5	5	4	4	5	4.33	4	4	4	4
8	4	5	5	4.66	4	5	5	4.66	3	5	4	4
9	3	4	5	4	4	5	5	4.66	3	5	4	4
10	4	5	5	4.66	4	4	5	4.33	4	5	5	4.66
11	5	5	5	5	4	5	4	4.33	4	5	4	4.33
12	5	5	4	4.66	4	5	4	4.33	4	5	5	4.66
13	5	5	5	5	4	5	4	4.33	4	5	5	4.66
14	5	5	5	5	5	5	4	4.66	5	5	4	4.66
15	5	5	5	5	5	5	4	4.66	5	5	4	4.66
16	5	5	5	5	5	5	4	4.66	4	5	5	5
17	5	5	5	5	5	4	5	4.66	5	4	5	4.66
18	5	5	4	4.66	5	5	5	5	5	5	5	5
19	5	5	5	5	4	5	5	4.66	4	4	5	4.33
20	5	5	5	5	4	3	5	4	5	5	4	4.66
21	5	4	5	4.66	3	5	4	4	4	4	5	4.33
22	4	5	5	4.66	4	5	5	4.66	4	4	4	4
23	5	5	5	5	4	4	5	4.33	4	4	4	4
24	5	5	5	5	4	4	5	4.33	3	5	5	4.33

25	5	5	5	5	4	4	4	4	3	4	5	4
26	5	5	5	5	4	3	5	4	5	3	5	4.33
27	5	5	5	5	4	4	5	4.33	4	3	4	3.66
28	4	5	5	4.66	4	5	4	4.33	4	4	4	4
29	5	5	5	5	5	4	4	4.33	4	5	5	4.66
30	5	4	5	4.66	5	4	4	4.33	4	3	5	4
31	5	5	5	5	4	5	4	4.33	5	5	5	5
32	4	5	5	4.66	4	5	4	4.33	4	5	4	4.33
33	5	5	4	4.66	4	5	4	4.33	4	5	4	4.33
34	4	3	5	4	4	5	4	4.33	4	4	4	4
35	5	4	5	4.66	5	5	4	4.66	3	4	3	3.33
36	4	4	5	4.33	4	5	5	4.66	4	5	4	4.33
37	4	4	5	4.33	4	5	5	4.66	5	4	3	4
38	3	5	5	4.33	4	5	5	4.66	3	5	4	4
39	3	4	5	4	4	3	5	4	5	3	3	3.66
40	4	4	5	4.33	4	4	5	4.33	2	3	4	3
	<b>TOTAL AVERAGE:</b>			<b>190.24</b>	<b>TOTAL AVERAGE:</b>			<b>177.52</b>	<b>TOTAL AVERAGE:</b>			<b>169.6</b>

## APPENDIX D

## Computation of the one-way Analysis of Variance

## Appearance

Groups	Count	Sum	Average	Variance
T1	40	188.53	4.71325	0.117796859
T2	40	184.13	4.60325	0.039268654
T3	40	178.5	4.4625	0.072029487

## ANOVA

Source of Variation	Sum of Square	Degree of Freedom	Mean of Square	F	P-Value	F crit
Between Groups	1.263815	2	0.6319075	8.274831402	0.00043528	3.0737629
Within Groups	8.934705	117	0.076365			
Total	10.19852	119				

## Aroma

Groups	Count	Sum	Average	Variance
T1	40	174.51	4.36275	0.123466603
T2	40	179.18	4.4795	0.130589487
T3	40	175.51	4.38775	0.141715321

## ANOVA

Source of Variation	Sum of Square	Degree of Freedom	Mean of Square	F	P-Value	F crit
Between Groups	0.302315	2	0.1511575	1.145793982	0.32151294	3.073762904
Within Groups	15.435085	117	0.1319238			
Total	15.7374	119				

**Taste**

Groups		Sum	Average	Variance
T1	40	174.51	4.36275	0.123466603
T2	40	179.18	4.4795	0.130589487
T3	40	175.51	4.38775	0.141715321

**ANOVA**

Source of Variation	Sum of Square	Degree of Freedom	Mean of Square	F	P-Value	F crit
Between Groups	0.302315	2	0.1511575	1.145793982	0.321512939	3.073762904
Within Groups	15.435085	117	0.1319238			
Total	15.7374	119				

**Texture**

Groups		Sum	Average	Variance
T1	40	190.24	4.756	0.097470763
T2	40	177.52	4.438	0.075621538
T3	40	169.56	4.239	0.187070769

**ANOVA**

Source of Variation	Sum of Square	Degree of Freedom	Mean of Square	F	P-Value	F crit
Between Groups	5.44018667	2	2.72009333	22.657118094	4.8194E-09	3.073762904
Within Groups	14.04636	117	0.12005436			
Total	19.4865467	119				

**APPENDIX E**  
**PROCEDURES IN MAKING**  
**FIDDLEHEAD FERN ICE CREAM IN 3 DIFFERENT TREATMENTS**

**Ingredients**



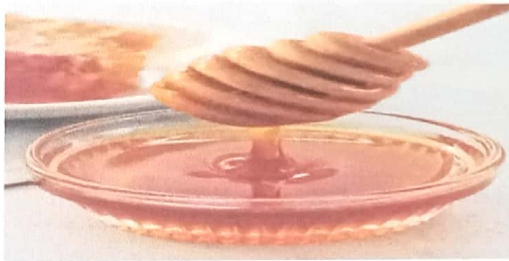
2 cups (500ml)



1 cup (250ml) condensed milk



1 tsp. (5.69 grams)  
ginger



1 tbsp. (14.7ml) honey



½ tsp. (2.84 grams) salt

**For the fiddlehead fern to be used in different treatments:**

**For treatment 1:** ½ cup blanched fiddlehead fern

**For treatment 2:** 1 cup blanched fiddlehead fern

**For treatment 3:** 1 ½ cup blanched fiddlehead fern

## PROCEDURE

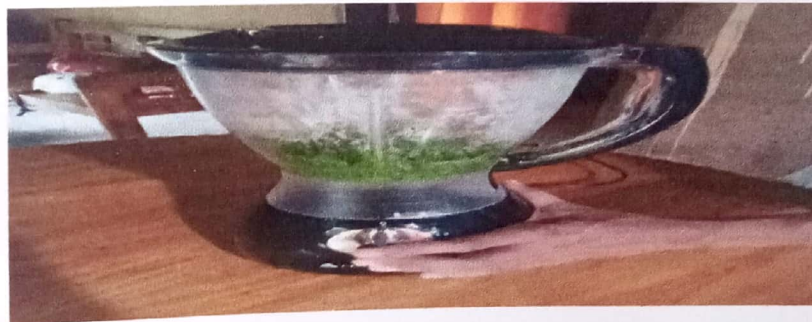
1. Prepare all the needed ingredients, tools, materials and equipment in one table.



2. Wash Fiddlehead Fern into a clean water and cut in into small pieces. Boil water in a pot, blanch small batches of Fiddlehead Fern at a time. Drain using a strainer, Set aside and let it cool.



3. Blend the blanched fern until paste like consistency.



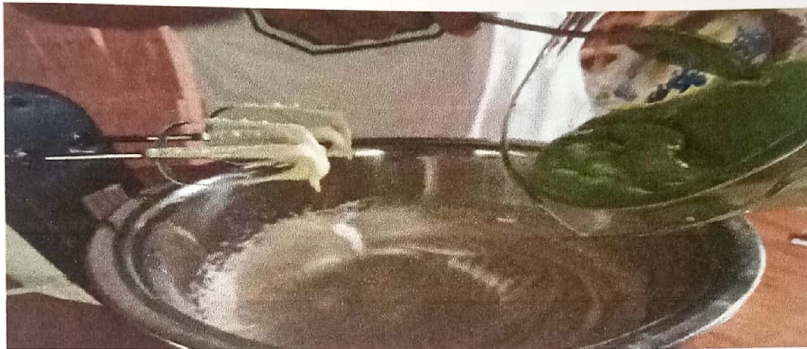
4. Whip 2 cups of cream and then slowly add 1 tbsp. honey.



5. In a separate bowl, mix Fiddlehead fern ( $\frac{1}{2}$  cup for T1, 1 cup for T2,  $1\frac{1}{2}$  cup for T3) 1 cup condensed milk, 1 tsp. powdered ginger,  $\frac{1}{2}$  tsp. salt.



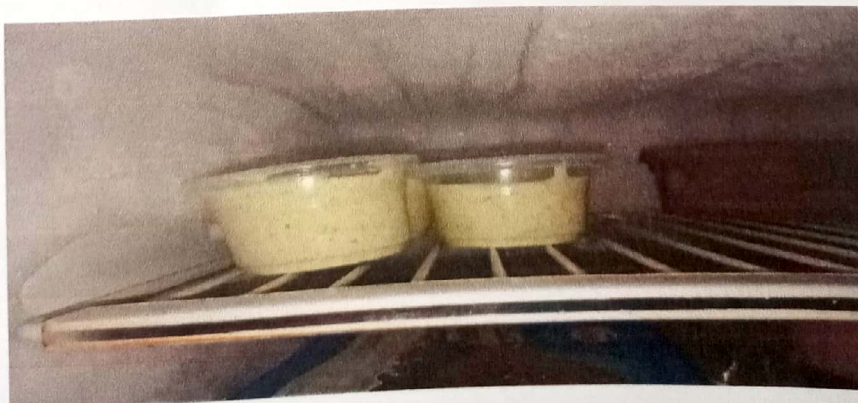
6. Gently add the fern mixture into the cream and honey mixture. Mix until well combined.



7. Put the mixture on a container and label each according to its treatment.



8. Put it into the freezer.



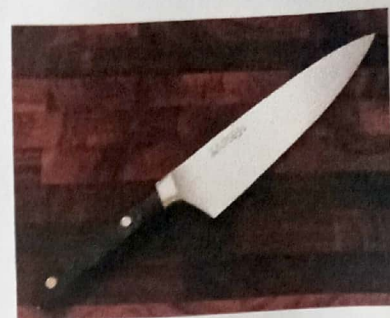
### Tools, Materials and Equipment



Measuring Spoon and  
Cups



Spoon and Fork



Knife



Saucepan



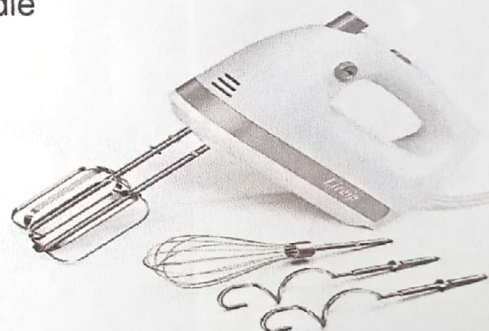
Ladle



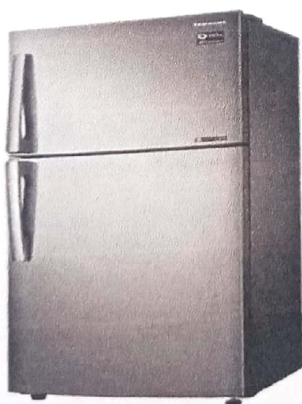
Mixing Bowl



Strainer



Electric Mixer



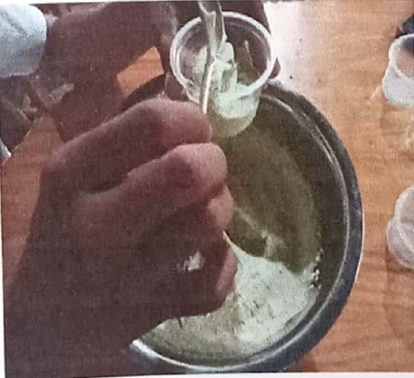
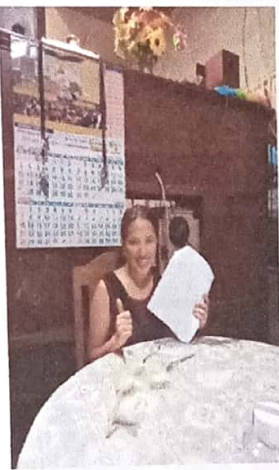
Refrigerator



Blender

# APPENDIX F

## DOCUMENTATION



**APPENDIX G**  
**RESEARCHER'S BIODATA**



**PERSONAL BACKGROUND**

---

Name : JERWIN OCHAVILLO CABANLIT  
Age : 25  
Home Address : Poblacion Norte, Batuan, Bohol  
Date of Birth : March 30, 1996  
Place of Birth : Purok 5, Poblacion Norte, Batuan, Bohol  
Religion : Roman Catholic  
Citizenship : Filipino  
Civil Status : Single  
Name of Father : Jimmy Cabasag Cabanlit  
Name of Mother : Leoncia Ochavillo Cabanlit

**EDUCATIONAL BACKGROUND**

---

Elementary : Batuan Central Elementary School Annex  
Poblacion Norte, Batuan, Bohol  
Secondary : Batuan National High School  
Poblacion Vieja, Batuan, Bohol  
College : Bohol Island State University- Bilar  
Campus, Zamora, Bilar, Bohol

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## RESEARCHER'S BIODATA



### PERSONAL BACKGROUND

---

Name : CRISTEL JANE DIVINAGRACIA JUMAWID  
Age : 21  
Home Address : Poblacion Vieja, Batuan, Bohol  
Date of Birth : April 2, 2000  
Place of Birth : Cebu, City  
Religion : Roman Catholic  
Citizenship : Filipino  
Civil Status : Single  
Name of Father : Eleazar Hewe Jumawid  
Name of Mother : Alma Divinagracia Jumawid

### EDUCATIONAL BACKGROUND

---

Elementary : Lungsod-Daan Elementary School  
Poblacion Vieja, Batuan, Bohol  
Secondary : Batuan National High School  
Poblacion Vieja, Batuan, Bohol  
College : Bohol Island State University- Bilar  
Campus, Zamora, Bilar, Bohol

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## RESEARCHER'S BIODATA



### PERSONAL BACKGROUND

---

Name : JOMAR TUBA PALINGCOD  
Age : 21  
Home Address : Rosariohan, Batuan, Bohol  
Date of Birth : July 08, 2000  
Place of Birth : Batuan, Bohol  
Religion : Roman Catholic  
Citizenship : Filipino  
Civil Status : Single  
Name of Father : Saturnino Organiza Palingcod  
Name of Mother : Emelda Tuba Palingcod

### EDUCATIONAL BACKGROUND

---

Elementary : Lungsod-Daan Elementary, School  
Poblacion Vieja, Batuan, Bohol  
Secondary : Batuan National High School  
Poblacion Vieja, Batuan, Bohol  
College : Bohol Island State University- Bilar  
Campus, Zamora, Bilar, Bohol

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## RESEARCHER'S BIODATA



### PERSONAL BACKGROUND

---

Name : RUBY SIMBAJON  
Age : 21  
Home Address : Cantigdas, Batuan ,Bohol  
Date of Birth : February 25, 2000  
Place of Birth : San Luis Gingo-og City  
Religion : Baptist  
Citizenship : Filipino  
Civil Status : Single  
Name of Father : Romeo Mahinay Caluspos Sr.  
Name of Mother : Herminia Simbajon Caluspos

### EDUCATIONAL BACKGROUND

---

Elementary : Cantigdas Elementary School  
Cantigdas, Batuan, Bohol  
Secondary : Batuan, National, High, School  
Poblacion, Vieja, Batuan School  
College : Bohol Island State University- Bilar  
Campus, Zamora, Bilar, Bohol

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