Utilization Of Onion (Allium cepa) Ice Cream

Honey Skynely F. Mondano1*, Francis Rey D. Craecle2, Angelica Mae E. Condez3, Anjaneth F. Montalban4, Carmen Angela N. Nacis5, Sheianerose N. Niog6, Abby Maxwell G. Saurin7, Rena E. Servidad8

[1,2,3,4,5,6,7,8] *Iloilo Science and Technology University, Philippines*

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Correspondence Email:
mondanoskyne06@gmail.com

Abstract

This experimental study was conducted to determine the level of perception of the evaluators on Onion (Allium cepa) Ice Cream as to appearance, aroma, taste, texture and general acceptability in two formulations. This study also determined the significant difference in the level of perception of the evaluators on the two formulations of Onion Ice Cream in all its sensory characteristics and general acceptability. The study made use of the Five-Point Likert Scale to determine the perception of the evaluators on the finished product as to appearance, aroma, taste and texture and the Nine-Point Hedonic Scale for the general acceptability. Mean, Standard Deviation and t-test at 0.05 level of significance were used as statistical tools. Sensory Evaluation Checklist based on Five-Point Likert Scale and Nine-Point Hedonic Scale was administered to collect data. The evaluators of the study were the thirty (30) resident vendors of Barangay La Consolacion, Miagao, Iloilo that were selected through purposive sampling. The study was conducted during the second semester of the School Year 2021-2022. The results of the study revealed that as to appearance, Formulation A (250 grams white onion) was perceived as white and Formulation B (500 grams white onion) was perceived to have a slightly white appearance. For the aroma, both formulations was perceived as moderately strong onion aroma. In terms of taste, Formulation A was perceived as moderately onion taste while Formulation B was perceived as very onion taste. The texture of Formulation A was perceived as extremely smooth while the Formulation B was perceived as smooth. As to general acceptability, Formulations A and B was both perceived as like very much by the evaluators. Inferential statistics also revealed that there was a significant difference in the perception of evaluators as appearance, taste and texture in white onion (Allium Cepa) in making ice cream. However, there was no significant difference in the perception of evaluators as to aroma. The findings further revealed that there was no significant difference in the perception of the evaluators as to general acceptability of the two formulations of Onion (Allium cepa) Ice Cream. This implied that the Onion Ice Cream prepared by the researchers was accepted by the evaluators in all its sensory characteristics in two formulations and so for the general acceptability. The

researchers came to the conclusion that white onion is a potential main ingredient in making ice cream. Therefore, farmers and white onion growers should be encouraged to plant more white onion for mass production of the product to be sold at barangay La Consolacion and other barangays for their additional income. Further studies or even a follow-up on development of other recipes using onion is also encouraged to ascertain the validity of the result and to determine the proximate analysis and shelf life of the onion ice cream.

1. Introduction

1.1 Background of the Study

Proper nutrition and healthy eating practices play a vital role in people's lives. It can help guard against malnutrition and help prevent diseases such as obesity, diabetes and cancer. Nowadays, people especially children prefer to eat junk food, street food and processed food which are not good to our health and could cause illness. According to Abraham et al., 2018; Smith, 2011), excessive and regular consumption of junk food can cause cardiovascular diseases, weight gain, increase obesity, type 2 diabetes, heart disease, stroke and certain cancers.

Ice cream is a universal dessert enjoyed by many. It is a frozen dessert made from cream and ice, with added flavors and sweeteners. The meaning of the name "ice cream" varies from one country to another. In some countries, such as the United States, "ice cream" applies only to a specific variety, and most governments regulate the commercial use of the various terms according to the relative quantities of the main ingredients, notably the amount of cream.

White onion (Allium cepa) commonly known in the Visayan language as puti nga sibuyas, have long been used in the Philippines as a natural antioxidant, are an impressive vegetable that boasts a powerful punch of nutrients, which delivers incredible advantages for the heart, digestion, and blood. The strong antibacterial and antioxidant traits are well-known to build a robust immune function and keep infections at bay. This root vegetable is largely used to uplift the flavor and aroma of any savory dish. Thus, regular addition of white onions to one's diet is an easy way to promote overall well-being.

During this time, people are now looking for healthier alternatives in their choice of food. Experts says, one cup of chopped onions also provides at least 13.11% of an adult's recommended daily intake of vitamin C. As an antioxidant, this vitamin helps counter the formation of free radical compounds that have links to cancer.

With Filipino craving towards sweet snacks from morning until late at night, either during special occasions or even normal days just to spend time for eating, different desserts and foods came into innovation. One of the many favorite for desserts is the ice cream.

Since Miagao is considered as the "Onion Capital of the Visayas", the proponents conducted this study to make people or the Miagaowanons" realize and gain knowledge on how creative white onion can be. More so, the researchers want to come up with an innovation of choosing a different but healthful treat in making an ice cream that will satisfy the consumers and can contribute to their healthy lifestyle.

1.2 Statement of the Problem

This study was conducted to determine the level of acceptability of Onion Ice Cream in terms of appearance, aroma, taste, texture, and general acceptability. Specifically, the researchers sought answers to the following questions:

1. What is the level of perception of the evaluators on the onion ice cream in two formulations in terms of appearance, aroma, taste, texture, and general acceptability?

2. Is there a significant difference in the level of perception of the evaluators on the onion ice cream in two formulations in terms of appearance, aroma, taste, texture and general acceptability?

1.3 Hypothesis

There is no significant difference in the level of perception of the evaluators on onion ice cream in two formulations in terms of appearance, aroma, taste, texture, and general acceptability.

1.4 Theoretical Framework of the Study

This study was anchored on the theory of innovation (Singleton 2011). The theory explains that the innovation is a production process that produces something called "design". Innovation involves a wide range of approaches for study. From an initial vision of innovation focused primarily on the economic process and the functioning of markets (Schumpeter, 1934, 1942), the study of innovation moved towards the invention of products and processes, technology, leadership and industry-wide factors, among others.

Research on this subject has progressed and considers more specific aspects such as those related to the capabilities of organizations, processes of creativity and implementation of innovations, and improvement of organizational performance.

According to the most recent literature, innovation can be visualized as a process that considers both the production of creative ideas (stage of idea generation) and the implementation of these ideas toward better procedures, practices, or products (stage of implementation), and can be defined that innovation at work are the processes, results and products of attempts to develop and introduce new and better ways of doing things, asserting that this process can occur at individual, team, organizational, or a combination of these levels (Anderson et al., 2014).

The study was considered as a form of innovation in the sense that Onion Ice Cream is a new creation of a product which is more palatable and nutritious. It is along this line, that the utilization of white onion in making ice cream was perceived by the evaluators. The two formulations of onion ice cream was evaluated in terms of appearance, aroma, taste, texture and general acceptability of the evaluators. In this study, the white onion ice cream was evaluated as a new innovation of vegetable product.

1.5 Conceptual Framework of the Study

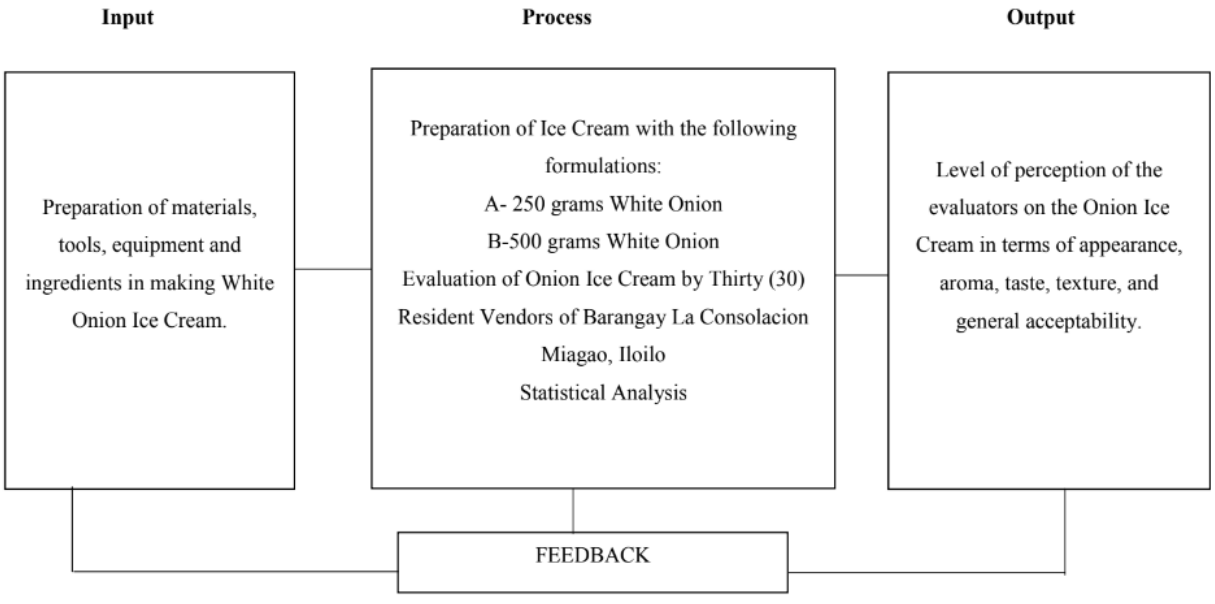

Fig 1: Shows the Schematic Diagram illustrating the conceptual paradigm of the study.

1.6 Scope and Delimitation of the Study

This study focused on the use of white onion which was utilized as an ingredient in making ice cream. Onion bulbs was bought at Barangay, Bagumbayan, Miagao, Iloilo. This study was conducted to determine the acceptability of white onion (Allium cepa) ice cream as to appearance, aroma, taste, texture and general acceptability.

The evaluators of this study composed of thirty (30) resident vendors of Barangay La Consolacion, Miagao, Iloilo that were selected through purposive sampling. This was conducted during the second semester of the School Year 2021-2022.

This study utilized the experimental method that were limited to the preparation of the evaluators on ice cream in different proportions of steamed white onion (Allium cepa blanc) such as 250 grams steamed white onion and 500 grams steamed white onion.

The study used Likert Scale range of means to describe the weighted mean of the appearance, aroma, taste, and texture while the Hedonic Scale Range of means for the general acceptability. T-Testing was employed to test the significance of the difference to the mean in two formulations.

1.7 Significance of the Study

The researchers believed that this study will not only yield data that will be helpful to them more so to the farmers or onion growers, businessmen and food establishment owners, consumers, students, teacher and administrator and future researchers.

The Farmers or Onion Growers. The result of the study may encourage farmers to plant more white onion to make utilize as an ingredient in making ice cream.

Businessmen and food establishment owners. These people may gain insights on innovated food products which have high market value. White onion ice cream can be sold at affordable price and selling nutritious food that is good to the taste of people especially children.

Consumers. The result of this study will provide health benefits to the consumers. This may encourage them to make new product using white onion as a flavor.

Students. The result of the study will give more information about the nutritive value of white onion and will also provide them new insights on the methods and ingredients in the preparation of white onion ice cream.

Teachers and Administrator. They will be able to spread and share the findings of the recipe to their students and colleagues.

Future Researchers. The findings of this study may provide insights on the level of acceptance of white on ice cream in terms of taste, aroma, texture, and appearance and it will pave way for more expounded studies on similar field.

2. Research Methods

This study used the experimental method in obtaining the most precise and reliable data. It is a technique of discovering information by means of experimentations. (J.P. Chaplin, 1998). Experimental method is an investigation in which hypothesis is scientifically tested.

The main purpose of this study was to determine the level of perception of white onion ice cream in two (2) formulations in terms of appearance, aroma, taste, texture and general acceptability. Product A represented the ice cream with 250 grams of white onion and Product B with 500 grams of white onion.

2.1 Evaluators of the Study

This study was conducted among Thirty (30) resident vendors of Barangay La Consolacion, Miagao, Iloilo. Purposive sampling was used in choosing the evaluators. The researchers prepared a Sensory Evaluation Checklist that was given to the evaluators for them to evaluate the finished products.

Table 1. Evaluators of the Study

Evaluators	N	Percent
Resident Vendors	30	100%

2.3 Data Gathering Instrument

To achieve the objectives of this study, the researchers made a letter addressed to the Campus Administrator, Barangay Captain and a letter to the evaluators. When White Onion Ice cream was done, the researchers prepared a Sensory Evaluation Checklist for the acceptability test in this study that served as a guide for the respondent's evaluation process. The evaluators evaluated the products in two formulations as to appearance, aroma, taste, texture and general acceptability by checking the corresponding column using Five-Point Likert Scale and Nine-Point Hedonic Scale. Data Processing technique was gathered, tabulated, and analyzed using T-Test.

2.4 Data Gathering Procedures

This experimental study was composed of four (4) phases:

Phase I- Preparation of Materials, Tool and Equipment in Making Onion Ice Cream

Phase II- Preparation of the White Onion

Phase III- Procedure

Phase IV- Evaluation of finished product by the panel of evaluators.

Phase I- Preparation of materials, tools, and equipment

The different materials, tools and equipment were prepared since they were substantial in conducting this experimental study. Mixing bowl used for holding and mixing various ingredients, wooden spoon used for mixing and stirring some ingredients, chopping board and chef knife used for cutting and slicing onion, casserole pot used for steaming onion, bowl used for cooling steamed onion, digital weighing scale used for measuring steamed white onion, electric mixer used for mixing cream, condensed milk and salt, plastic cups where onion ice cream was put and labeled.

Other equipment was used in the preparation were gas stove for cooking steamed onion, electric blender used for blending steamed onion and refrigerator used for freezing onion ice cream.

The ingredients used in making onion ice cream in formulation A were the following:

250 grams white onion

250 ml Nestle Cream

300 ml Condensed milk

¼ tbsp Iodized Salt

The ingredients used in making onion ice cream in formulation B were the following:

500 grams white onion

250 ml Nestle Cream

300 ml Condensed milk

¼ tbsp Iodized Salt

Phase II- Preparation of the White Onion

a. Wash the white onion in the running water.

b. Peel and slice the white onion. Mince in medium size.

c. Steam white onion for 2-3 minutes only to lessen the bitterness of the taste and set aside to cool. d. Measure the steamed white onion according to the two formulations (250 grams and 500 grams).

Phase III- Procedure

a. Beat the chilled All Purpose Cream until it becomes double mixture. b. Mix condense milk and beat it well.

c. Blend the steamed white onion.

d. Mix all the ingredients in a mixing bowl using the electric mixer until it become smooth. e. Place the ice cream in a mixing bowl.

f. Transfer to the plastic cups and put in the freezer. g. Ready to serve as White Onion Ice Cream.

Phase IV- Evaluation of finished product

After the white onion ice cream was done, the researchers prepared, labeled and arranged the finished product for evaluation. The evaluators of the study were the thirty resident vendors of Barangay La Consolacion, Miagao, Iloilo.

The researchers distributed the sensory evaluation checklist to the evaluators together with the products. The researchers allowed the evaluators to taste the product and evaluated it by answering the sensory evaluation checklist based on Five-Point Likert Scale and Nine-Point Hedonic Scale to solicit the honest perception on the product. Each evaluator was given an instruction on how to evaluate the white onion ice cream.

2.5 Data Processing Techniques

After the evaluation of the finished products, the data gathered was tallied, tabulated, and computed using the appropriate statistical tools. Thereafter, the data was analyzed and interpreted. The data gathered used the Mean, Standard Deviation, T-Test, Five-point Likert scale, and Nine- point Hedonic scale.

Mean was used to determine the divided point between the responses of the evaluators in terms of appearance, aroma, taste, texture, and level of general acceptability of the product. Standard deviation was used to determine the homogeneity of the subject in terms of different variables in the study. To determine whether there is a significant difference in the level of general acceptability of white onion ice cream, T-Test level of significance was used.

The results of this statistical statement were provided for the analysis and interpretation of the data. The findings were used as basis in making the appropriate conclusions and recommendations.

2.6 Table of Interpretation

Appearance (color)

Description	**Scale**
White	4.21-5.00
Slightly White	3.41-4.20
Creamy White	2.61-3.40
Slightly Creamy White	1.81-2.60
Dirty White	1.00-1.80

Aroma

Description	Scale
Extremely strong onion aroma	4.21-5.00
Very strong onion aroma	3.41-4.20
Moderately strong onion aroma	2.61-3.40
Slightly strong onion aroma	1.81-2.60
No onion aroma	1.00-1.80

Taste

Description	Scale
Extremely onion taste	4.21-5.00
Very onion taste	3.41-4.20
Moderately onion taste	2.61-3.40
Slightly onion taste	1.81-2.60
No onion taste	1.00-1.80

Texture

Description	Scale
Extremely Smooth	4.21-5.00
Smooth	3.41-4.20
Moderately Smooth	2.61-3.40
Slightly Smooth	1.81-2.60
Not Smooth	1.00-1.80

The Nine-Point Hedonic Scale was used in the evaluation of general acceptability.

General Acceptability

Description	Scale
Extremely Like	8.12-9.00
Like Very Much	7.23-8.11
Like Moderately	6.43-7.22
Like Slightly	5.45-6.33
Neither Like nor Dislike	4.56-5.44
Dislike Slightly	3.67-4.55
Dislike Moderately	2.78-3.66
Dislike Very Much	1.89-2.77
Dislike Extremely	1.00-1.88

3. Result and Discussion

This chapter presents the results, discussions, analysis, and interpretation of data as the results of the study.

Table 2. The perception of the evaluators on identified characteristics on the two formulations of the White Onion IceCream

Characteristics	M (SD)	Description
Appearance		
Formulation A	4.30 (.702)	White
Formulation B	3.60 (.813)	Slightly White
Aroma		
Formulation A	2.83 (1.085)	Moderately Strong Onion Aroma
Formulation B	3.28 (.921)	Moderately Strong Onion Aroma
Taste		
Formulation A	3.00 (.870)	Moderately Onion Taste
Formulation B	3.76 (.858)	Very Onion Taste
Texture		
Formulation A	4.23(.430)	Extremely Smooth
Formulation B	3.33 (.660)	Smooth
General Acceptability		
Formulation A	8.00 (.909)	Like Very Much
Formulation B	7.73 (1.014)	Like Very Much

Legend:
Formulation A- 250g white onion
Formulation B- 500g white onion

Table 2 presents the level of perception of the evaluators on white onion ice cream in two formulations as to appearance, aroma, taste, texture and general acceptability.

The results showed that in terms of appearance, the Formulation A (M= 4.3000; SD= .070221) had a white appearance and Formulation B (M=3.6000; SD=.81368) had lightly white appearance as perceived by the evaluators. This meant that the addition of white onion in different formulations affects the appearance of the product. This further meant that the result can be attributed to the natural color of white onion which is white.

In terms of aroma, both Formulations A (M=2.8333; SD= 1.08543) and B (M=3.28333; SD= .92182) had a moderately strong onion aroma. The two formulations with different amount of white onion had a moderately strong onion aroma perceived by mostly by the evaluators. This meant that the ice cream with 250 grams of onion and 500 grams of onion produced strong onion aroma. This implied that the different quantity of white onion added to the ice cream in two formulations does not affect the aroma of the product.

In terms of taste, the Formulation A (M= 3.000; SD=.87099) had a moderately onion taste while Formulation B (M= 3.7667; SD= 85836) had a very onion taste. This meant that the 250 grams and 500 grams of onion can provide a strong onion ice cream taste. This implied that the greater the amount of onion added to the mixture can give a very onion taste while the lesser the amount of onion added to the mixture can give a moderately onion taste.

The results showed that as to texture of onion ice cream, Formulation A (M=4.233; SD= .43018) had an extremely smooth texture while Formulation B (M=3.3333; SD= .66089) had a smooth texture. This implied that the Formulation A with lesser amount of onion used in the ice cream produced an extreme smooth texture while Formulation B with more amount of white onion used in the ice cream was a little bit coarse compared to Formulation A.

Lastly, as to the general acceptability, Formulation A (M=8.0000, SD= .90972) and Formulation B (M=7.7333, SD =1.01483) was both perceived as like very much by the evaluators. This revealed that white onion ice cream in both formulations was accepted by the evaluators in terms of appearance, aroma, taste and texture. This contains 250 grams and 500 grams of onion.

Based on the result of the study, the two formulations (250g and 500g onion) was both preferred by the evaluators, because the white appearance of the onion mix well with the other ingredients, the aroma of the ice cream gives aromatic onion aroma of the product and the smooth texture of the ice cream.

Inferential Data Analysis

The significant difference in the perception of the 30 resident vendors as to appearance, aroma, taste, texture and general acceptability of onion ice cream was determined in the present investigation. To analyze the data, t-test was employed. The 0.05 level of significance was used as criteria for the non-rejection or rejection of null hypothesis.

Table 3. Differences in the Perception of the Identified Characteristics of the Different Formulations of Onion Ice Cream

**significant at p< 0.05*

Characteristics	*M*	*Df*	*t*	*p-value*	*Remarks*
Appearance					
Formulation A	4.3000	58	3.567	.001	Significant
Formulation B	3.6000				
Aroma					
Formulation A	2.8333	58	-1.685	.097	No Significant
Formulation B	3.2333				
Taste					
Formulation A	3.0000	58	3.434	.000	Significant
Formulation B	3.7667				
Texture					
Formulation A	4.2333	50	6.251	.001	Significant
Formulation B	3.3333				
General Acceptability					
Formulation A	8.0000	58	1.072	.288	No Significant
Formulation B	7.7333				

Table 3 shows the t-Test results in the perception of the evaluators of Onion in Making Ice Cream as to appearance, aroma, taste, texture and general acceptability.

The result revealed that as to appearance, there was a significant difference on the perception of the evaluators of Onion in Making Ice Cream, with the obtained p-value of .001, which is lower than the significant of 0.05. This implied that the appearance of the product depends upon the quantity of the onion mix to other ingredients in making ice cream. The null hypothesis which states that there is no significant difference on the two formulations perceived by the evaluators in terms of appearance was therefore, rejected.

As to aroma, the result showed that there was no significant difference in the perception of the evaluators of Onion in Making Ice Cream, with the obtained p-value of 0.97, which is higher than the significant of 0.05. This implied that the amount of onion present in two formulations does not differ the aroma of the product.

Therefore, the null hypothesis which states that there is no significant difference on the two formulations as perceived by the evaluators as to aroma was accepted.

As to taste, the result showed that there was a significant difference on the two formulations perceived by the evaluators with the obtained p-value of .000, which is lower than the significant of 0.05.This meant that the taste in two formulations were not the same as perceived by the evaluators. This implied that the different amount of onion added to the ice cream makes the taste varies from each other. The null hypothesis states that there is no significant difference on the two formulations as perceived by the evaluators in terms of flavor was therefore, rejected.

As to texture, the result showed that there was a significant difference in the perception of the evaluators on white onion ice cream with the obtained p-value of 001, which is lower than the significant of 0.05. This implied that the presence of white onion added to the ice cream affects the texture of the product.

Therefore, the null hypothesis which states that there is no significance difference on the two formulations of white onion ice cream perceived by the evaluators in terms of texture was therefore, rejected.

As to general acceptability, the results revealed that there was no significant difference in the perception of the evaluators on the white onion ice cream in two formulations, with the obtained p-value of .288, which is higher than significant of 0.05.

This implied that both formulations with 250 grams of white onion and 500 grams of white onion were the same. The null hypothesis that states that there is no significance difference on the two formulations of white onion ice cream as perceived by the evaluators in terms of the general acceptability was therefore, accepted.

4. Conclusions

In view of the findings, the following conclusions were made:

The evaluators evaluated "Like Very Much" the onion in making ice cream which are beneficially healthy to entice people especially children to eat vegetables rather than unhealthy foods.

White onion is a potential main ingredient used in making ice cream. This innovation can help combat malnutrition with the health benefits of onion brought to the body such as reducing the risk of several types of cancer, improving mood, maintaining skin health and improve digestive health.

The amount of onion added in different formulations contributes to the acceptability of the product in terms of appearance, aroma, taste and texture.

Both Formulations with 250 grams of white onion and 500 grams of white onion was perceived as like very much by the evaluators in all its sensory characteristics.

Implications

According to the findings and discussion explained, the product in two different formulations was accepted by the resident vendors of Brgy. La Consolacion despite the fact that white onion is an unusual flavor for a dessert because of its distinct flavor. However, the use of white onion in making ice cream could give health benefits to the consumers and entice children to eat healthy foods rather than junk foods. It indicated that the utilization of white onion in making ice cream was like very much by the evaluators in two formulations. As an implication, white onion is a potential main ingredient to be utilized in making ice cream.

Recommendations

Based on the findings and conclusions of the study, the following courses of action were recommended:

Since the white onion ice cream in two formulations was liked very much by the evaluators, mass production of the product may be recommended to be sold at barangay La Consolacion and other barangays.

Farmers and White onion growers may be encouraged to plant more white onion for mass production of the product and for additional source of income. To do that, local government should help them with their needs such as supply, resources and etc. since according to Republic Act 7607: Empowering Smallhood Farmers in their Economic Endeavors declaring that smallholders are to be regarded as equal partners in development, and therefore should be wholly supported in their economic endeavors.

Business men and food establishment owners may sell this product to provide healthy and nutritious ice cream for the consumers.

Students from food technology and other food related courses should be encouraged to use white onion as part of the dessert to develop more innovation of products out of onion.

Teachers and Administrator should be encouraged to disseminate information regarding on the acceptability of onion ice cream through their lecture demonstration and livelihood training.

Further studies or even a follow-up on development of other recipes using onion are also encouraged to ascertain the validity of the result and to determine the proximate analysis and shelf life of the onion ice cream.

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