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Sensory Evaluation Of Ice Cream With Pork Stock Stabilizer

Edgar C. Galendez, PhD

Bohol Island State University-Main Campus
edgar.galendez@bisu.edu.ph

ABSTRACT

The core intent of this study was to assess the sensory evaluation of ice cream with pork stock as stabilizer in terms of appearance, aroma, taste, and texture. This study employed the experimental design using the 4-point Hedonic Scale conducted in Tagbilaran City, Baclayon, Panglao, Bohol and Bohol Island State University-Main Campus. There were 375 respondents in the study. The respondents were ice cream makers, ice cream consumers, residents and non-residents of Tagbilaran City, Baclayon, and Panglao, Bohol. Food technology teachers and students, BHRST/BSHM Students, MATVE/MSIT major in food technology masteral students, tourists, food business operators, and food business personnel during the academic year 2018-2019. To determine the respondents' preference on sensory evaluation and significant difference in the degree of likeness. The data gathered were tabulated using the Weighted Mean. The findings revealed that the shelf-life of ice creams with pork stock stabilizer lasted for 11th weeks under freezing condition with ice crystals were very apparent in the texture of ice cream, The ice cream with pork stock stabilizer were rated "Like Very Much" by the respondents' preference on liking level with the AWM of 3.57.

I. Introduction

Pork bones are discarded parts of meat, some thrown it away for its no longer use in cooking and some feed it to the animals like dogs, cats, and even pigs. Utilizing of this scrap food into a high-quality food product as ingredient that will benefit the physiological demands is a challenge to every technologist.

In this study, pork bones will be used as stabilizer ingredient in making an ice cream by extracting the soluble substance found in the bones and use as a stabilizer for frozen dessert specifically ice cream.

The stabilizer is one of the important ingredients in ice cream making. It builds the body of ice cream and promotes smooth texture that does not melt easily in the room temperature.

Some commercial stabilizer for ice cream could be found in the market costly, and some chemical stabilizers with lower cost are not directly available in the market and there is usually a need to order from the manufacturer in bulk.

Most of the household recipes for home-made ice cream and certain commercial ice cream makers exclude of using stabilizers due to unavailability in the market. Instead, the ice cream made is loaded with pricey cream products, starch, and egg to inhibit the formation of ice crystal. The product is costly and has no resistance when exposed to room temperature.

To highlight the utilization of pork bones, the researcher intended to produce ice cream with pork bones as ice cream stabilizer. This study gives an idea to the people of the usefulness of pork bones in ice cream production.

II. Objectives

The main thrust of this study was to determine the sensory evaluation of pork bone stock as ice cream stabilizer among the food technology teachers, selected food technology students of BISU-Main Campus, and selected residents, ice cream maker, food business owners, and employees in Tagbilaran City, and nearby towns of Tagbilaran City, Bohol during the school year 2018 – 2019.

Specifically, this research sought to answer the following questions:

1. What is the descriptions of ice cream with pork stock stabilizer in terms of:

1.1 preparation;
1.2 tools and equipment used;
1.3 procedure; and
1.4 shelf life?

2. What is the sensory evaluation in terms of descriptive test rating and liking level of ice cream with pork stock stabilizer in terms of:

2.1 appearance;
2.2 aroma;
2.3 taste and
2.4 texture?

III. Methodology

Design. In this study the researcher employed experimental design to determine the sensory evaluation of ice cream with pork stock as stabilizer in terms of apperance, aroma, taste, and texture.

Environment and Participants. The study had respondents composed of 5 ice cream makers, 165 residents, 5 food technology teachers, 30 food technology students, 50 HRST/BSHM students, and 40 MATVE or MSIT students major in food technology, 55 tourists (local or foreign) 5 food business operators, and 20 food business personnel, with a total of 375 respondents who assessed the products.

Instrument. A modified questionnaire was used as data – gathering tool to determine the sensory attributes of the products based on appearance, aroma, taste, and texture. The respondents evaluated the product using 4-point modified Hedonic Scale patterned from the work of Gatchalian for the respondents' preference on the degree of liking, while 4-point Hedonic Scale for the descriptive test.

Research Procedures.

Phase 1. Permissions to conduct the study and administration of the questionnaire.

Phase II. Procedures in the processing of pork bone stock for ice cream stabilizer.

Phase III. Preparations in making ice cream with pork stock as stabilizer.

Phase IV. Phase IV. Preparations of the needed ingredients, tools, and equipment.

Phase V. Testing the product for nutritional analysis.

Phase VI. Distribution of the questionnaire.

Phase VII. Testing and evaluating the products.

IV. Statistical Treatment of Data

The gathered data were analysed and interpreted using the weighted mean employing the formula to determine the sensory evaluation of ice cream with pork stock as stabilizer in terms of appearance, aroma, taste, and texture. The researcher used 4-point Hedonic Scale to identify the respondents' sensory preference of the products.

Scale	Numerical Range	Descriptive Rating	Interpretation
4	3.25-4.00	Like Very Much	The respondents very much liked the food represented in terms of appearance, aroma, taste, and texture.
3	2.50-3.24	Like Moderately	The respondents liked the food represented in terms of appearance, aroma, taste, and texture.

2	1.75-2.49	Dislike Moderately	The respondents somewhat disliked the food represented in terms of appearance, aroma, taste, and texture.
1	1.00-1.74	Dislike Very Much	The respondents extremely disliked the food represented in terms of appearance, aroma, taste, and texture.

Below is the average weighted range descriptive test based on the 4–point Hedonic Scale.

Scale	**Numerical Range**	**Appearance**	**Aroma**	**Taste**	**Texture**
4	3.25-4.00	Very Appealing	Very Pleasant	Very Tasty	Very Creamy
3	2.50-3.24	Appealing	Pleasant	Tasty	Creamy
2	1.75-2.49	Slightly Appealing	Slightly Pleasant	Slightly Tasty	Slightly Creamy
1	1.00-1.74	Not Appealing	Unpleasant	Not Tasty	Not Creamy

V. Results and Discussion

1. The description of ice cream using pork stock as stabilizer:

Preparation

Table 1 Selection of Pork Bones by Testing the Stability Of Chilled Pork Stock at Room Temperature

Pork Bones 5-6 months old	**QUANTITY**		**Simmering Time**	**Description of Chilled Stock**
	Bone	**Water**		
Pork Feet	500g	2 L	3 hrs.	It has a less solid-jelly texture and melts after 3 hours
Pork Back Bones	500g	2 L	3 hrs.	Watery texture
Pork Spare Ribs	500g	2 L	3 hrs.	It has a jelly-saucy texture and totally melts after 45 minutes
Mix Bones	500g	2 L	3 hrs.	It has a jelly-watery texture and totally melts after 30 minutes

Illustration 1

Testing the Melting Resistance of Chilled Pork Stock at Room Temperature

Pork Bones Stock

Feet	**Ribs**	**Back Bones**	**Mix Bones**
			
Less Firm	Soft	Watery	Very Soft
After 30 minutes			
			
After 45 minutes			After 50 Minutes
	Completely Dissolved After 45 Minutes		Completely Dissolved After 50 Minutes
After 2 hours			
			
After 3 hours			
Completely Dissolved After 3 Hours			

The stability of stocks is shown in Table 1, and based on the result, the researcher chose a stock with a more solid texture and a high melting resistance at room temperature. This stock was chosen because ice cream products need to be resistant to melting at room temperature. The researcher selected pork feet as a stabilzer for ice

cream for it has a longer resistance at room temperature and have a solid form texture.

Tools and Equipment

The tools and equipment include dry and liquid measuring cups and dietetic scale were used for measuring raw ingredients. Stock pot was used to simmer stocks. Cheese cloth was used for straining particles of stock. Skimmer was used to skim floats particle of stocks while simmering. Cooking thermometer was used to maintain simmer temperature at 95˚C. Chopping board was used to place the bones for cutting. Butcher knife was used to cut large bones. Stock container is used in stocking the liquid in the chiller. Ice cream container was used as a packaging for ice cream. Refrigerator is used to freeze the ice cream mixture. Cooking time is used to monitor the simmering time of stocks.

Procedures in Making Pork Stock

1. Prepare all the ingredients, tools, and equipment to be used.
2. Measure the pork bones into 1 kg using weighing scale.
3. Cut the bones into pieces and put these into the stock pot.
4. Measure the water to 4 liters using liquid measuring cup and add the water to the bones in the stock pot.
5. Let it boil. Before the water reach to boiling point, scums float on the surface of water, remove it by using skimmer until the liquid clears.
6. When it boils, reduces the heat and maintains the temperature to 98˚C to have a uniform quality of stock with other batches. Simmer to 3 hours.
7. While simmering, always check the temperature of stock using stock thermometer and skim the froth off the surface and remove any fat.
8. Let it cool and strain the stock using cheese cloth.
9. Chill in the refrigerator. When the stock solidifies, remove the fat on the surface of the stock.
10. Ready to use for ice cream.

Procedures in Making the Ice Cream with Pork Stock as Stabilizer

1. Prepare all the ingredients, tools, and equipment to be used.
2. Measure all the ingredients properly using the weighing scale for appropriate measurement. Dry measuring cup, liquid measuring cup, and measuring spoon can also be used.
3. Put the water in a saucepan and add skimmed milk, sugar, and stabilizer in a low heat temperature. Simmer the mixture to

95˚C using cooking thermometer for quality consistency of texture with other batch.

4. Set aside and cool.
5. Pack the mixture and freeze it for 8 to 12 hours.

Shelf Life

The Observation method was used in conducting the shelf life of ice cream using sense of smell, touch, sight, and taste to identify the quality of ice cream in the freezing storage unit.

On the 8th week of storing under freezing condition, tiny ice crystals were noticed on the surface of ice cream but no sign of spoilage. On the 11th week it was declared spoiled, the texture is very hard with icy colour, when exposed at room temperature it becomes watery with white particles separated. It was declared spoiled due to the texture observed.

2. The sensory evaluation of ice cream in terms of descriptive test rating and liking level of ice cream with pork stock as stabilizer.

Table 2 Descriptive Test Result on the Sensory Evaluation of Ice Cream with Pork Stock Stabilizer
N=375

Sensory Attributes	**Ice Cream with Pork Stock Stabilizer**	
	WM	**Description**
Appearance	3.41	Very Appealing
Aroma	3.52	Very Pleasant
Taste	3.60	Very Tasty
Texture	3.22	Creamy

Table 3 Sensory Evaluation Results of Ice Cream with Pork Stock Stabilizer
N=375

Sensory Attributes	**Ice Cream with Pork Stock Stabilizer**	
	WM	**Description**
Appearance	3.51	Like Very Much
Aroma	3.60	Like Very Much
Taste	3.66	Like Very Much
Texture	3.50	Like Very Much
AWM	**3.57**	**Like Very Much**

In table 2, the descriptive test on the appearance of ice cream with pork stock stabilizer is described as “Very Much Appealing” from the respondents.

In table 3, in the respondents’ evaluation of the liking level of the appearance, the rating is 3.51. The clear translucent natural colour of stock perfectly blends well with the colour of pure white powder of skimmed milk that results into appealing white colour and creamy appearance of ice cream described as “Like Very Much” by the respondents.

Aroma is one of the important sensory attributes to determine the desirability and quality of the product. Pork stock stabilizer received with the rating of 3.52 described as “Very Pleasant” and 3.60 for the respondents’ evaluation on sensory attributes described as “Liked Very Much”.

This implies that the aroma of pork stock stabilizer in ice cream mixture is very much acceptable by the respondents. Milk is the basic ingredient and the largest component in ice cream making. The aroma of milk is pure, mild, and has a pleasing dairy smell complements well with the meaty aroma of pork.

Sweet taste is the heart of ice cream. It is one of the five tastes that the human tongue can detect, and sweetness is a defying quality of ice cream. Sweeteners play an important role in any ice cream. Stocks have a natural sweet taste of meat and skimmed milk has a lactose sugar that is sweet by nature when added it with granulated sugar, it gives right complement sweetener to the product.

The ice cream stabilized with pork stock stabilizer got the rating of 3.60 for the descriptive test and described as “very Tasty”. The very tasty ice cream received “like Very Much” in sensory evaluation with the rating of 3.66 weighted mean. The pork stock blends well with the sweetness of the ice cream mixture.

The texture of ice cream with pork stock stabilizer is rated 3.22 described as “creamy” texture. The creamy texture of ice cream is “Like Very Much” in sensory evaluation by the respondents with the weighted mean of 3.47. Stabilizers are the body of ice cream responsible for the overall quality of ice cream especially the texture that binds the whole mixture of ice cream and inhibits the formation of ice crystals during the process that contributes mellowness, viscous and accounts the rich sensation of ice cream that melts in the mouth. In addition, stabilizers also control the melting properties of ice cream in room temperature.

The overall rating of the sensory evaluation is 3.57 described as “Like Very Much” in all aspects of sensory evaluation. It means that the pork bone stock is highly potential as stabilizing ingredient for ice cream making.

VI. **Conclusions**

Based on the result of the study, the pork bone stock is highly viable as an ingredient for ice cream stabilizer with a high preference in all sensory attributes that is comparable to the commercial stabilizer on the market with a lower cost, nutritious and natural.

VII. Recommendations

The product has to undergo further nutritive examination to give more complete information on the nutritional content of the product. The researcher has to produce variety flavours of ice cream as requested by the respondents. The University may introduce the pork stock as a stabilizer for ice cream making in the community as part of extension program of partnered LGU as alternative livelihood.

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