

# The Consumer Acceptability of Purple Sweet Potato-Based Ice Cream Product

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## Abstract:

This study discusses the fortification or addition of nutrients to ice cream products by utilizing purple sweet potatoes as natural dyes and non-fat solids. The background of this study is that, in Indonesia, commercial ice cream products commonly use synthetic dyes and fat solids in the form of skim milk which has a high lactose content and could have an adverse effect on health. Moreover, the abundant yield of purple sweet potatoes in Indonesia is not utilized optimally. This study employed a research and development method by conducting a consumer acceptability test (organoleptic test) on 100 panelists. This study formulated the purple sweet potato ice cream product by steaming and smoothing purple sweet potatoes and then mixing them with ice cream ingredients. The next processes included mixing, pasteurization, homogenization, aging, and freezing. Thus, this study sought to examine the extent to which the consumer acceptability of the ice cream product made by using purple sweet potatoes as natural dyes and non-fat solids. The results suggested that purple sweet potato-based ice cream was accepted by the consumers from which 79% of them gave "like" response to the flavor, 81% gave "attractive" response to the color, 62% gave "fragrant" response to the aroma, 80.4% gave "soft" response to the texture, and 85.4% gave "like" response to the physical appearance.

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## Introduction:

Ice cream is one of the pastry products in the form of half-frozen foam which contains emulsified fat and air. Ice cream is a popular dessert because it has a sweet, cool, refreshing taste and has very attractive shapes and colors.

The problem behind this study includes the ingredients of ice cream including fat, non-fat solids and food coloring. The fat is usually used in processing ice cream is fresh milk. It can enhance the creamy taste of ice cream and can provide good melting properties in the final result of ice cream. The next ingredient is a non-fat solid. Usually, the used ingredient is non-fat milk solid such as concentrated skim milk and condensed milk. This constituent material is important in making ice cream because it can increase and maintain the texture of ice cream so as not to be chewy. Although it has good benefits in the making of ice creams,

non-fat milk solid could be dangerous for some people because it has a high lactose content where not all human bodies are able to digest lactose content properly, especially children and people who experience lactose intolerance. When someone is unable to digest lactose properly, he/she will experience diarrhea, nausea, excessive gas waste, abdominal pain, and bloating.

The other ingredient of ice cream is food coloring. The types of ice cream sold in the market have a variety of colors and flavors, but the appearance does not guarantee food safety for consumers. It is because commercial ice cream products available in the market often use synthetic dyes that can have adverse effects on health. The addition of synthetic dyes in food is commonly avoided by consumers. This is a reason to replace the synthetic dyes with a type of natural dye to produce healthier ice cream.

From the description above, this study seeks to make an ice cream innovation by replacing the synthetic dye and non-fat solid with ingredients that are far more beneficial for health. One of the ingredients that can replace the synthetic dye and non-fat solid in the production of ice cream is the purple sweet potato.

Purple sweet potato can replace non-fat milk solid as a constituent of non-fat solid in the production of ice cream. It acts as a water binder so the ice cream does not melt easily.

As seen from its nutritional composition, purple sweet potato has many benefits, including preventing cancer, because it contains active substances, selenium, and iodine. The active ingredient contained in purple sweet potato is 20 times higher than other tubers. The purple sweet potato can also act as an antioxidant and anti-bacterial. Substances contained in it are also diverse, including vitamins A, B1, C, Riboflavin, calcium iron, crude fiber, phosphorus, calcium, fat, protein, and anthocyanins (natural colorant). The anthocyanin is a compound that can be a substitute for synthetic dyes. It can also prevent liver damage, senility, stroke, aging, heart disease, and can act as an anti-oxidant.

## **THEORETICAL FRAMEWORK**

### **Ice Cream**

Ice cream is a frozen food product consisting of milk, sweetener milk, stabilizer, emulsifier, and flavor. It is made through a combination of freezing and agitation processes. The principle of making ice cream begins with forming air cavities on ice cream ingredients or ice cream mix. This process creates volume development that makes ice cream lighter, not too dense, and has a soft texture (Pandaga and Sawitri, 2005).

According to Eckles (1980), ice cream is a frozen milk product in the form of solid milk made from a mixture of milk, sugar, ingredients, flavoring, and aroma with or without the addition of other food ingredients (emulsifiers and dyes) and packaged in special plastic or cardboard.

### **Purple Sweet Potato**

The purple sweet potato is commonly referred to as *Ipomoea batatas blackie* because it has deep purple skin and flesh. Due to its rich nutrient contents, purple sweet potato becomes a type of tuber that has many advantages over other types of sweet potatoes (Wijayanti, 2011).

The main advantage of purple sweet potato is starch. The starch content in a purple sweet potato consists of 30-40% amylose and 60-70% amylopectin. In addition, it has high levels of food fiber, which is 4.72% per 100gr (Ratnayati, 2011). According to Utomo and Yulifianti (2011), purple sweet potatoes also contain many sources of antioxidants derived from anthocyanin, vitamin C, vitamin E, and beta-carotene.

### **Consumer Acceptability**

Acceptability of food is determined by stimuli arising from food through the five senses (sight, hearing, taste, smell, and touch). The main factor that influences the acceptability of food is the stimulation of the flavor. The quality of flavor means the extent to which the attraction of food can give rise to someone's taste (Nasoetion, 1980).

## **METHODS**

This study used an experimental research method. The material served as the object of this study was purple sweet potatoes as a natural coloring agent and non-fat solid in the production of ice cream, while the subject in the study was the consumer acceptability. There were 100 respondents assigned to taste the purple sweet potato-based ice cream products.

## **RESULTS AND DISCUSSION**

Of the 100 random panelists, 26 people (26%) gave "strongly like" response to the purple sweet potato ice cream, while 49 people (49%) gave "like" response to the product. Meanwhile, 23 people (23%) gave "somewhat like" response, 2 people (2%) gave "dislike" response, and no one (0%) gave "strongly dislike" response.

Of the 100 random panelists, as many as 29 people (29%) gave “extremely attractive” response to the color of purple sweet potato-based ice cream as the natural dye and non-fat solids. As many as 50 (50%) people gave “strongly attractive” response, 20 people (20%) gave “moderately attractive”, 1 person (1%) gave “slightly attractive”, and no one (0%) gave “not attractive at all”.

Of the 100 random panelists, as many as 9 people (9%) gave “extremely fragrant” response to the ice cream aroma. As many as 34 people (34%) gave “strongly fragrant”, 43 people (43%) gave “moderately fragrant”, 14 people (14%) gave “slightly fragrant” response, and no one (0%) gave “not fragrant at all”.

Of the 100 random panelists, 32 people (32%) gave “extremely soft” response to the ice cream texture. As many as 47 people (47%) gave “strongly soft” response, 18 people (18%) gave “moderately soft”, only 3 people (3%) gave “slightly soft” response and no one (0%) gave “not soft at all” response.

Of the 100 random panelists, 38 people (38%) gave “strongly like” response, while 51 people (51%) gave “like” response. As many as 11 people (11%) gave “no strong opinion” response, and no one (0%) gave “dislike” nor “strongly dislike” responses.

## CONCLUSION

The ice cream products made by utilizing purple sweet potatoes as natural dyes and non-fat solids are accepted or preferred by consumers. As seen from the consumer acceptability test, the consumers averagely respond on a scale of 3 to 5, which is “no strong opinion” to “strongly like”. In addition, the results of the organoleptic test (flavor, aroma, texture, color, and physical appearance) show that the purple sweet potato-based ice cream products are in line with the criteria of general ice cream products. This makes the purple sweet potato ice cream is easily accepted by the consumers.

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