

## SENSORY EVALUATION OF YOGURT IN VARIOUS SUGAR CONCENTRATION

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### ABSTRACT

The purpose of this study was to determine the hedonic test of various concentrations of sugar in UHT milk with the help of *Lactobacillus casei* in making yogurt on the color, aroma, taste, and thickness of the resulting yogurt. In this study, there are treatment factors, namely the concentration of granulated sugar. The results showed that the concentration of sugar affects the color, aroma, taste, and thickness of the resulting yogurt. In the hedonic test, the results were observed that in each provision of sugar found a difference in values obtained.

**Keywords:** Hedonic test, milk, *lactobacillus casei*, yogurt

### INTRODUCTION

Milk is a food ingredient that is rich in nutrients that are beneficial to the organism. Milk contains calories, protein, fat, vitamins and minerals. Some people don't like to consume fresh milk because they don't like the taste, aroma, or appearance of the milk itself. Therefore, various attempts were made to change the taste, aroma, and appearance without reducing the nutritional value, so that more people would prefer to even attempt to increase the nutritional value of the milk. One of the dairy products is yogurt. In yogurt, there is an additional microbial population that is very beneficial for the human body.

The bacteria or microbes are *Lactobacillus casei*, the bacteria metabolize in the milk so that there is a change in the taste, aroma, and appearance of the milk. The aroma of milk feels fragrant and delicious with a fresh and slightly sour taste and the milk becomes rather thick. With the taste, aroma, and appearance of milk like this, some people who initially did not like milk came to like it so that their body's need for nutrients can be fulfilled (Asri *et al.*, 2017).

Yogurt is a product made from milk through the fermentation process of lactic acid bacteria, *Lactobacillus bulgaricus* and

*Streptococcus thermophilus* (Collins, et al., 1992). Yogurt is very good for health, especially to maintain stomach acidity and can suppress the growth of pathogenic bacteria in the intestines. Besides, yogurt also contains protein with high levels, even higher than milk protein. This is due to the addition of proteins from microbial synthesis and protein content from these microbes (Winarto, 2003).

The pattern of life of the people who realize the importance of health causes food needs are not limited to the fulfillment of conventional nutrition for the body and mouth gratification for a good taste but are expected to be able to function to maintain health and fitness. Such food products are commonly called functional food products. One example of conventional food products is fermented foods or drinks.

Fermented food and beverage products from various materials have long been made and known to humans. One of the fermentation products is yogurt. Yogurt is a fermented milk product made from full milk and skim milk that has been pasteurized or sterilized and then added the microbial culture *Streptococcus thermophilus* and *Lactobacillus bulgaricus* symbiotic products lactic acid from the characteristic flavor of yogurt (Oberman,

1985). Yogurt is consumed because of its freshness, aroma and distinctive texture. The distinctive taste in yogurt arises because of the fermentation process (Yusmarini, 2004). Yogurt is also a product that is more easily digested in the digestive tract than whole milk or whole milk (Prayitno, 2006).

Fresh cow's milk is a very high nutritional food, so it is not only beneficial for humans but also microorganisms. Therefore we need processing in terms of milk. One of the milk processing efforts that can overcome this is by the way of fermented milk. This fermentation of milk processing will make cow's milk turned into cow's milk yogurt.

Apart from fresh milk, various alternative ingredients can be used as the main ingredient of yogurt as well as skimmed milk powder. The quality of skimmed milk powder is very important in producing good quality yogurt.

UHT milk, UHT milk is milk that is made using a heating process that exceeds the pasteurization process, generally refers to a certain combination of time and temperature to obtain sterile commercial products, the selection of the right combination of time and temperature is also called the UHT sterilization technique (Eniza, 2004). The advantage of UHT milk is its very long shelf life at room temperature, which reaches 6-10 months without preservatives and does not need to be refrigerated (Ide, 2008).

## MATERIALS AND METHODS

### Tools and Materials

The main ingredients used in the research are UHT milk, culture *Lactobacillus casei* pure, and granulated sugar. The tools used in this research are scale pipettes, stoves, pans, stirrers, thermometers, measuring cups, plastic cups with cups lid, and incubators.

### Methods

The study was conducted in the Laboratory of Microbiology, Department of Biology, Faculty of Mathematics and Natural Sciences, Surabaya State University in November 2017. The process of making yogurt in this study by boiling 1 liter of UHT milk (for each treatment) until the temperature is 90 0C in an open container while stirring for 1 hour.

### Effects of sugar concentration in sensory.....

Then 75 grams of sugar, 100 grams, 125 grams, and 150 grams are added and stirred until dissolved and than store it in a sterile bottle.

After the temperature becomes 40-50°C, the milk is inoculated with *Lactobacillus casei* bacteria and the bottle is tightly closed again. Then incubated at 40°C for 2-3 days, to form 3 layers, namely the first layer is yellowish white, the second layer is clear which contains *Lactobacillus casei* and the third layer is thick white which is protein.

## RESULTS AND DISCUSSION

The hedonic yogurt test results can be seen in the Table 1.

Table 1. The result of yogurt hedonic test.

The Test	Treatment			
	A (75 g)	B (100 g)	C (125 g)	D (150 g)
Colour	60	60	68	43
Smell	43	49	56	57
Flavour	35	42	52	65
Aroma	48	57	62	66

The results of the analysis showed that there were differences in the values of each treatment to the color, aroma, taste, and thickness of yogurt. This is because increasing of sugar concentration, will on decreasing the bacterial activity so that the formation of lactic acid from lactose is reduced and affects the color, aroma, taste, and thickness of yogurt. This is following the statement of Winarno *et al* (1980) if bacteria, yeast, and mold are placed in a concentrated solution then the water in the cell will come out through the membrane and flow into the sugar solution.

The colors that appear on yogurt produce varying values in the hedonic test. Because the colors that appear in all four treatments produce the various color. For taste and aroma attributes, the highest value was found in the treatment 150 gram of sugar. Similarly, the resulting aroma. This is caused by the culture of *Lactobacillus casei* pure which is still actively producing lactic acid. Lactic acid causes an increase acidity (Kosikowski, 1982).

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Giving sugar can inhibit *Lactobacillus casei* to produce lactic acid, increasing of sugar

concentration, will on decreasing the sour taste in yogurt and affect to the taste and aroma.



Figure 1. The yogurt result

The highest level of consistency is found at the highest sugar concentration, which is at 150 gram sugar concentration. Increasing of sugar concentrations, will held the thicker of yogurt this is because dissolved solids are formed. Purwati (2006) said that high acidity can cause the protein to clot, and cause product thickness. So the level of viscosity produced in the treatment of 150 grams of sugar concentration is lower than the level of viscosity in other treatments.



Figure 2. Participant of the yogurt hedonic test

## CONCLUSION

Based on the results of the study it can be concluded that the yogurt hedonic test there are various kinds of differences in color, aroma, taste, and thickness of yogurt in the treatment of various concentrations of sugar. The highest hedonic yogurt test results are at the highest sugar concentration of 150 grams.

It is recommended in making yogurt should use a sugar concentration of 150 grams/liter and use fresh UHT milk so that yogurt products can be obtained with better quality and much preferred.

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