

## The Effect Of Flavoring On The Organoleptic Of Local Variety Soya Juice

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### **ABSTRACT**

*The aim of the research was to determine the effect of adding sugar and flavoring at different shelf lives on the organoleptic characteristics of local varieties of soybean juice. The research was carried out from November 2023 to January 2024 in Brangkal Village, Jombang Regency and the Faculty of Agriculture KH. Abdul Wahab Hasbullah University. The treatment used are ; 1) B0J1 = soybean juice stored 1 hour after cooking, 2) B0J6 = soybean juice stored 6 hours after cooking, 3) B1J1 = soybean juice + granulated sugar stored 1 hour, 4) B1J6 = soybean juice + granulated sugar stored 6 hours after cooking, 5) B2J1 = soybean juice + strawberry flavoring, storage 1 hour after cooking, and B2J6 = soybean juice + strawberry flavoring, storage 6 hours after cooking. This research used an experimental method with a completely randomized design with one factor which was repeated three times. The sample in this study was soybean juice which was used in hedonic tests and the shelf life of it with 15 panelists. Data analysis used ANOVA with a further BNT test at the 5% level. It is known that the color of soybean juice and granulated sugar stored 6 hours after cooking was more favorable compared to the other 7 treatments. Soybean juice without added sugar or flavorings, with storage 1 and 6 hours after cooking, and soybean juice and sugar with storage 6 hours after cooking had the most favorable taste compared to the other 5 treatments*

**Keywords:** Soybean Juice; Organoleptic; Flavor

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### **INTRODUCTION**

Soybeans are an annual crop that is generally planted in the dry season, because it does not require large amounts of water. This plant is able to grow in areas with a height of 0-500 meters above sea level. Indonesia as a tropical region has great potential to produce soybeans (Agung, 2016). Based on data from the 2022 Central Bureau of Statistics, the domestic soybean production is 15,43 ku/ha (BPS, 2022). This shows that Indonesia has quite potential as a soybean producer. It should be noted that soybeans contain around 35% proteins, even in superior varieties, it content can reaches 40-43 percent (Masdani & Ariyanto, 2021). The processed forms that are consumed by the public include tofu, tempe and soybean juice. Soybean juice is a drink with a high level of consumption, because the nutritional content is quite good and accessible to the public. This drink contains high levels of bioactive compounds, so it can act as an antioxidant. Koswara (2006, *in* Nirmagustina & Hertini, 2013) states that apart from containing vitamins, minerals, calcium and phosphorus, this drink has high nutrition, because it contains protein equivalent to cow's milk, around 3.5g/100grams, low fat range. 2.5g/100grams. Therefore, it is necessary to increase the consumption of soy milk as a substitute for animal milk in society. However, the process of making soybean juice needs to be changed to keep up with consumer interest in soybean juice. Generally, pure soybean juice has an unpleasant taste that people don't like it. Meanwhile, on the other hand, people prefer sweet food/drinks.

Flavors are additional ingredients for food and drinks in the form of concentrated liquids. The main composition of these ingredients consists of flavoring, taste, and coloring. Flavors are often known in the community, namely pasta that has a fruity taste. The addition of flavorings turns the soybean juice drink which initially had a pleasant taste into another flavor which is expected to be in demand according to the wishes so that many people like it.

When making soybean juice with the addition of sugar and flavorings, it is necessary to carry out the organoleptic properties of soybean juice. It is in order to maintain the quality of soybean juice including taste, viscosity, color and flavor. This aims to ensure that the nutritional content is maintained and remains popular with the public. Apart from that, it is necessary to determine the organoleptic properties of the soybean juice based on its storage capacity so that the effect of its storage capacity on the organoleptic properties is known. Therefore, it is necessary to study the effect of addition of sugar and flavorings on the organoleptic characters of local variety soybean juice. The aim of the research is to determine the effect of addition of sugar and flavorings on different shelf lives on the organoleptic characters of local variety soybean juice.

## METHOD

The research was carried out from November 2023 to January 2024 in Brangkal Village, Bandarkedungmulyo District, Jombang Regency and the Faculty of Agriculture, KH.A. Wahab Hasbullah University Jombang. The tools used in this research were pans, stoves, blenders, filter cloths, jugs, scoops, basins, measuring cups, teaspoons, tablespoons and bottles. The ingredients used in this research were 1 kg of Wilis variety soybeans, pandan leaves, salt, granulated sugar and strawberry flavoring.

Then, 250 grams of soybean seeds are cleaned of dirt, soaked for 5 hours, then washed thoroughly while kneading so that the peel of the seeds is peeled off. Next, added 2000 ml of water to the soybean seeds and grind them using a blender. After the soybean pulp is formed, it is filtered using a filter cloth, so that around 2 liters of soybean juice is obtained. The soybean juice is boiled over medium heat. Sugar (250 gr), salt (1/2 tsp), and strawberry flavoring (1 tbsp) are added to the soybean juice according to the treatment, then stirred until smooth. After boiling, the stove heat is reduced and the soybean juice is stirred continuously. After the foam comes out, the stove fire is increased slightly and the soybean juice is stirred until the foam disappears, then the stove is turned off.

This research uses an experimental method with a completely randomized design (CRD) with one factor consisting of the addition of sugar and/or strawberry flavoring (B) consisting of B0 = soybean juice (control), B1 = soybean juice + sugar, B2 = soybean juice + Strawberry flavoring, B3 = Soybean essence + Sugar + Strawberry flavoring. Each treatment was stored for one and 6 hours. Each was repeated three times. The material composition for each treatment is presented in Table 1 below:

**Table 1.** Composition of ingredients for making soybean juice based on Treatments

Ingredients	Treatments			
	B0	B1	B2	B3
Soybean	250 gr	250 gr	250 gr	250 gr
Water	2000 ml	2000 ml	2000 ml	2000 ml
Sugar	-	250 gr	-	250 gr
Salt	½ tsp	½ tsp	½ tsp	½ tsp
Flavoring	-	-	1 tbsp	1 tbsp

Note : tsp = teaspoon, tbsp = tablespoon

The treatments used in this research are as follows; 1) B0J1 = soybean juice (control) with storage 1 hour after cooking, 2) B0J6 = soybean juice with storage 6 hours after cooking, 3) B1J1 = soybean juice + sugar with storage 1 hour, 4) B1J6 = soybean juice + sugar with storage 6 hours after cooking, 5) B2J1 = soybean juice + strawberry flavoring with storage 1 hour after cooking, and B2J6 = soybean juice + strawberry flavoring with storage 6 hours after cooking.

The variables used in this research are; 1) the independent variable, namely the addition of sugar and/or flavorings and the storage time of soybean juice, and 2) the dependent variable, namely the organoleptic quality (color, flavor, viscosity and taste) of soybean juice 1 and 6 hours after cooking.

The sample in this study was soybean juice which was used in the hedonic test and the shelf life of soybean juice to determine the organoleptic properties of each treatment. The population in this study was 8 liters of soybean juice made by researchers by adding sugar and/or different flavors every 2 liters. The data collection method used in this research is the questionnaire method. The type of questionnaire used is a closed questionnaire, namely a questionnaire where the answer choices have been provided by the researcher and the panelists only need to tick (✓) in the column provided (Kurniawan, 2021). The instruments in this study included soybean juice with each treatment consisting of 3 repetitions for each panelist, totaling 15 panelists. The researchers conducted a questionnaire to 15 panelists by providing samples of soybean juice to carry out a hedonic test. The panelists filled out the assessment form according to their opinions regarding the color, taste, aroma and viscosity of soybean juice with different shelf lives. The assessment data obtained is converted into scoring. Testing of the organoleptic properties in this study was carried out twice, namely the organoleptic properties of soybean juice at 1 and 6 hours after cooking. The score values used for the 4 organoleptic characters are based on table 2 below:

**Table 2.** Score Values of Four Organoleptic Characteristics on the Effect of Addition Sugar and Flavorings to Soy Juice of Local Varieties

Organoleptic	Score values			
	4	3	2	1
Color	Very interesting	interesting	Not very interesting	No interesting
taste	-	+	++	+++
viscosity	Very thick	thick	Somewhat thick	liquid
flavour	Very tasty	delicious	Somewhat delicious	No delicious

Note : - = pleasant; + = unpleasant

Analysis of the data in this study was with descriptive statistics, using the test of variance (ANOVA). It was to determine the effect of adding sugar and/or flavorings on the organoleptic quality (colour, aroma, taste and viscosity) of soybean juice and the effect of storage time for soybean juice on organoleptic quality. The BNT further test at 5% level was used to determine real differences between treatments. The choice of further BNT testing was due to the unplanned nature of the treatment used for comparison.

## RESULT AND DISCUSSION

### Result

Based on the results of the analysis of the average scores from each organoleptic test, it is obtained in table 3 below.

**Table 3.** Average score of Organoleptic Characteristic of Soybean Juice of Local Wilis Varieties Tested

No.	treatments	Organoleptic Characters			
		color	flavor	viscosity	taste
1	B0J1	3.33 cd	3.33a	3.67a	3.47b
2	B1J1	2.62 ab	2.73a	3.04a	2.87a
3	B2J1	3.40 d	3.27a	3.53a	3.60b
4	B3J1	2.80 abc	2.87a	3.47a	2.73a
5	B0J6	3.07 abcd	3.13a	3.60a	3.47b
6	B1J6	3.49 d	3.07a	3.40a	3.60b
7	B2J6	2.60 a	3.13a	3.18a	3.07ab
8	B3J6	3.13 abcd	3.07a	3.40a	3.20ab

Note: Numbers followed by the same letter indicate no significant difference in the 5% BNT test.

Based on Table 3, it is known that there is a real difference in the color score of soybean juice with the addition of sugar and flavorings and storage time. The B2J6 score of 2.6 is significantly different from the B0J1, B2J1, B0J6, B1J6, and B3J6 treatments which have an average score of 3 on the 5% BNT

test. This shows that the color in treatment B2J6 was least liked by the questionnaire because the color was less attractive.

In the flavor test, there was no real difference in the score of liking the flavor of soybean juice with the addition of sugar and flavorings and the storage time. This shows that all treatments have a pleasant flavor.

Meanwhile, in the soybean juice viscosity test for each treatment, it was found that there was no real difference in the viscosity score of soybean juice with the addition of sugar and flavor and storage time, which was around an average of 3. This shows that all the treatments tested were on average thick.

In the hedonic test related to taste, there was a real difference in the taste score of soybean juice with the addition of sugar and flavorings and storage time. Table 3 shows that treatments B2J1 and B1J6 have an average taste score of 3.6 which is higher and not unpleasant compared to other treatments which are slightly unpleasant. Meanwhile, the B3J1 treatment had the lowest score, namely 2.73, compared to the other treatments. Therefore, B2J1 and B1J6 have a unique taste

### **Discussion**

Organoleptic properties based on color are used because they play an important role in the level of visual acceptance of the product (Khalisa, et al., 2021). Determining the quality of a food ingredient generally depends on color because color appears first (Winarno, 2002). This factor has a greater influence on the perception of the taste of beverage products than others (Wan, *et.al.*, 2015, in Kusumaningrum and Ratna, 2019). In the B2J6 treatment (soybean juice with the addition of strawberry flavoring at 6 hours of storage) the least preferred by the questionnaire because the color is less attractive. The change in color of soybean juice, which is generally yellowish, then the color changes to red, makes this treatment unpopular with respondents. It happened because respondents are generally more often encounter yellow soybean juice or without the addition of other colorings. Respondents are more familiar with choosing yellow/original soybean juice which is commonly found compared to other colors. Mohd-Any, Mahdzan, & Cher, (2013) reported that familiarity with food is more important for certain nations or communities. This is thought to be one of the reasons the panelists preferred yellow/original colors.

Flavours is an important factor to increase the attractiveness of a food. The delicious flavour of soy milk can arouse the appetite for drinking and attract consumers' attention. Food that tastes good generally has a good flavor (Khoir et al., 2022). Generally, respondents assessed that soybean juice in all treatments tested had a pleasant flavour score. In the process of processing soybeans into soy milk, one of the obstacle factors is the bad smell (beany flavour). This unpleasant smell is caused by the distinctive smell of soybeans themselves, apart from the work of the lipoxygenase enzyme found in soybean seeds, especially when processing soy milk (Fathurohman *et al.*, 2020). Naturally, the pleasant flavour of nuts is caused by the activity of the lipoxygenase enzyme, which hydrolyzes nut fat and produces hexanol compounds. Inactivation of the lipoxygenase enzyme can be done through heating. Apart from that, soybeans contain quite complete amino acids, the amino acid content in soybeans can also play a role in improving the aroma of flakes (Hapsari *et al.*, 2022)

When soybean juice is cooked, the water contained in it will evaporate, thereby reducing the water content and becoming slightly thickened. Agus (2012) stated that the evaporation of water during heating causes the water content to decrease and the solid concentration to increase. The higher of cooking temperature and cooking time, the water content will decrease (Nilasari, *et al.*, 2017). This is supported by Fitriani's (2008) statement that the longer the cooking time, the water content will decrease, which causes more water to evaporate so that the water content in the ingredients becomes smaller. The soybean juice tested had an average viscosity that was not significantly different, although from the 8 treatments, B0J1 had a higher viscosity score than the other treatments. In the process of processing soybeans into soybean juice, the addition of a certain amount of water affects the physical, organoleptic and chemical properties of soybean juice. Therefore, the addition of water and cooking time are considered in this test.

The main factor in determining consumer decisions regarding the level of preference for a food or beverage product is taste. In drinks, even though they appear attractive and contain rich nutrients, if they have an unpleasant taste, the drink will be less attractive to consumers (Khoir *et al.*, 2022). Treatments B0J1 (soybean juice/control 1 hour storage), B0J6 (soybean juice/control 6 hour storage), B1J6 (soybean juice+sugar 6 hour storage), and B2J1 (soybean juice + strawberry flavor 1 hour storage) respectively have taste score value 3.47; 3.47; 3.60, and 3.60 which achieved a taste that was not unpleasant, were significantly different compared to the other 4 treatments which had scores close to slightly unpleasant. One of the factors that influence taste include chemical compounds and a sweet taste caused by aliphatic

organic compounds containing hydroxyl (OH) groups, amino acids and glycerol (Meiyani *et al.*, 2014). The taste can arise due to the presence of volatile compounds originating from soybean juice which undergoes a sterilization process so that it has the same aroma as the raw material for making soybean juice (Hariono *et al.*, 2023). Granulated sugar is sucrose consisting of glucose and fructose (Thampan, 1982). The addition of sweetener is done to reduce the bitter taste of the soybean juice produced. The bitter taste is produced by the lipoxygenase enzyme itself (Asidi, 2009, in Nirmagustina & Hertini, 2013). Therefore, by adding a sweet taste to the soybean juice tested, the bitter taste was reduced so that the panelists liked it

## CONCLUSIONS

Based on the results and discussion, it can be concluded that the color of soybean juice and sugar stored 6 hours after cooking is more preferable than the other 7 treatments. Meanwhile, soybean juice without added sugar or flavours, with storage 1 hour and 6 hours after cooking, and soybean juice and sugar with storage 6 hours after cooking had the most favorable taste compared to the other 5 treatments.

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