

Research Article



Effect of Sugar Composition and Drying Time on Tomato Taste

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Informasi Artikel	ABSTRACT
<p>Submit: 22 – 05 – 2023 Diterima: 12 – 08 – 2024 Dipublikasikan: 30 – 09 – 2024</p>	<p><i>Habaring Huring Subdistrict, located in the Bukit Batu district of Palangka Raya City, is one of the tomato suppliers for the capital region, with a production range of 2,336 to 2,481. Fully ripe tomatoes tend to spoil quickly, with a relatively short storage life of 3-4 days. One of the ways tomatoes are utilized is by processing them into date tomatoes, a sweet snack made from tomatoes that are processed to resemble dates in taste and shape. This is done to enhance the appeal of tomato processing to the community. The research design used in this study is a Randomized Block Design, with the variables being tested as sugar composition and drying time, based on the preference level of date tomatoes. The preference level of date tomatoes was evaluated using hedonic tests, specifically focusing on taste. The panelists involved in the preference evaluation were 15 individuals from the general public and students. Data analysis was conducted using Duncan's Multivariate Range Test (DMRT). The results of the hedonic tests showed that sugar compositions of 600-800 grams, in terms of color, taste, and texture, were highly preferred ($\leq 80\%$) by the panelists, but the effect was not statistically significant. On the other hand, drying times of 3-6 days, in terms of color, taste, and texture, were highly preferred ($\geq 60\%$) and had a significant impact.</i></p> <p>Key words: <i>Date tomato, taste, sugar composition, drying time.</i></p>
Penerbit	ABSTRAK
<p>Program Studi Pendidikan Biologi FKIP Universitas Jambi, Jambi- Indonesia</p>	<p>Kelurahan Habaring Huring kecamatan Bukit Batu tingkat pemerintah Kota Palangka Raya, salah satu suplai tomat untuk wilayah ibu kota dengan produksi 2.336- 2.481. Buah tomat yang telah matang sempurna akan lebih cepat rusak dengan usia 3-4 hari penyimpanan relatif singkat. Salah satu pemanfaatan tomat yaitu diolah menjadi tomat kurma, berupa manisan yang berbahan dasar buah tomat yang diolah sedemikian rupa sehingga memiliki rasa dan bentuk seperti kurma. Hal ini merupakan untuk memperoleh daya tarik masyarakat terhadap pengolahan buah tomat. Desain penelitian adalah Rancangan Acak Kelompok dengan variabel yang di uji komposisi gula dan lama waktu pengeringan berdasarkan tingkat kesukaan tomat kurma. Tingkat kesukaan tomat kurma menggunakan uji hedonik terhadap cita rasa. Panelis uji tingkat kesukaan sebanyak 15 orang yaitu masyarakat umum dan mahasiswa. Analisis data menggunakan analisis Duncan Multivariat Range Test (DMRT). Hasil uji hedonik menunjukkan bahwa komposisi gula 600-800 gram terhadap warna, rasa dan tekstur $\leq 80\%$ sangat disukai oleh panelis namun tidak berpengaruh secara signifikan. Sedangkan lama waktu pengeringan 3-6 hari terhadap warna, rasa dan tekstur $\geq 60\%$ sangat disukai dan berpengaruh signifikan.</p> <p>Kata kunci: Tomat kurma, cita rasa, komposisi gula, waktu pengeringan</p>



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INTRODUCTION

In the highlands, tomato plants are one sort of horticultural crop that is frequently cultivated. Only domestic processing is now possible with tomatoes. Households use tomatoes as a vegetable or food source. Additionally, tomatoes have a high water content and contain vitamin C, making them excellent for maintaining healthy skin (Laga et al., 2019). Generally speaking, tomatoes are utilized in every recipe as a fruit vegetable that cannot be separated. At this time, tomatoes are mostly used by the general public as a condiment for meals, sauces, and juices. Few people are aware that tomatoes can be processed into goods that enhance their quality and shelf life. Tomatoes can be grown all year and are available in traditional markets in many parts of Indonesia. As a result, tomatoes are plentiful in frigid climates.

In Central Kalimantan, one of the tomato producers has an annual production rate of 18,663–19,088 quintals. Palangka Raya, one of the tomato suppliers for the capital city region, has a production of 2,336-2,481 (BPS Kalteng, 2022) and is located in the Bukit Batu sub-district under the city government level's Habaring Hurung Village (Abdi et al., 2017). People's salaries typically depend on market demands as a result of such massive production's impact on market prices, which are nevertheless volatile. Tomatoes will now cost Rp. 7,000 per kilogram, according to conversations with locals. The relatively short age of ripe tomatoes and the harvest season that corresponds with other locations are to blame for this sometimes high and sometimes low price, respectively. With 3–4 days of storage at room temperature or 27 C, perfectly ripe tomatoes will decay more quickly..

The fruit is considered to be high in nutrition because it contains a complete and beneficial combination of nutrients, including vitamins A and C, minerals like phosphate and calcium, as well as natural dietary fiber that is good for digestion and protein (Akmal & Sulistiawikarsih, n.d.). Fresh tomatoes also contain these nutrients. To be sure, tomatoes are a type of perishable fruit or vegetable due to their high water content. (Laga et al. 2019) claim that turning tomatoes into a product can prolong their shelf life and raise their selling price. Date tomatoes, dried sweets manufactured from tomatoes that resemble dates, are examples of products that can be processed from tomatoes. Date tomatoes can be eaten as snacks or as a replacement for raisins in cakes. They can also be used as a complimentary element in cakes. Date tomatoes are a dried, sugar-based product that has undergone processing. The optimum flavor of dried candied tomatoes is said to be associated with sugar compositions between 40% and 50%, according to a study (Akmal & Sulistiawikarsih, n.d.) based on the results attained. According to Handayani et al. (2002), the best tomato dates are those that are dried for 16 hours at a temperature of 80 °C. Some of the research mentioned above indicates that there is a need for the development of a technique to transform tomato products into tomatoes because there is no known relationship between the sugar composition of 30%, 60%, and 80% and the drying times of 4 days, 6 days, and 8 days and the flavor of date tomatoes. dates. Tomato-based sweets have a number of advantages, including a longer shelf life and the ability to be consumed even when it's not harvest time (Erlyani, 2011). In light of this, the goal of this study was to ascertain the impact of sugar composition and drying time on producing date tomatoes correctly in order to maximize their shelf life and flavor. Thus, it is anticipated that it will be

among the proper sugar compositions and the proper lengthy drying method when producing date tomatoes.

RESEARCH METHOD

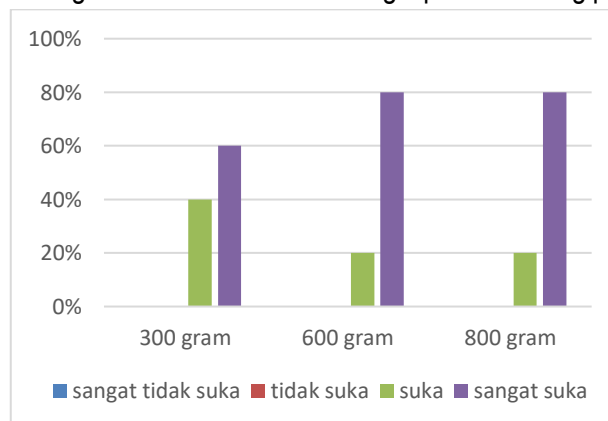
The State Islamic Institute of Palangka Raya's biology lab served as the site of this study. Two components are included in this factorial investigation, which uses a completely randomized design (CRD). Factor I (30%, 60%, and 80% of sugar, respectively) Factor II (drying time): 4, 6, and 8 days, respectively. The hedonic quality test for organoleptics, which takes into account the level of preference for the product, includes an assessment sheet with a value scale and a rubric as part of its data gathering methods. The ability of the human senses is used directly to carry out the hedonic evaluation. This evaluation is also known as a sensory evaluation. Using 15 panelists, hedonic test data will be collected. After receiving nine different treatments of date tomatoes and one actual date as the control, each panelist will be asked to rate the results on the evaluation form (assessment instrument). With the aid of a computer and the SPSS version 22 program, the taste data was evaluated descriptively and using various tests. A non-parametric statistical analysis was performed in this study because the sample size was limited. The collected data will be examined using a variety of ANAVA, and the Ducan Multiple Range Test (DMRT) will be used if it is determined that objective and subjective characteristics have an impact on the results.

RESEARCH RESULTS AND DISCUSSION

A. Sugar Composition

1. Color

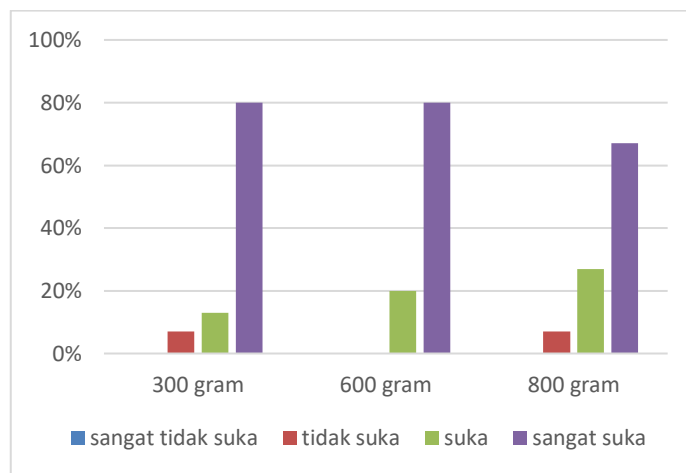
The color of the composition of 600 grams of sugar and 800 grams of sugar did not significantly alter, according to the results of the test on the color indicator. The composition of 300 grams of sugar differed significantly. According to the panelists' percentage preference levels, the greatest hue is at 600 and 800 grams, with 80% of them strongly liking it. Date tomatoes get their color from boiling sugar until it caramelizes. After cooking, non-enzymatic browning may alter the fruit's original hue. A caramelization process occurs when sugar that lacks amino acids is degraded as a result of heating it past its boiling point. (Laga et al., 2019)



Picture 1 Graph of Percentage Likeliness of Composition Based on Color Indicators

2. Flavour

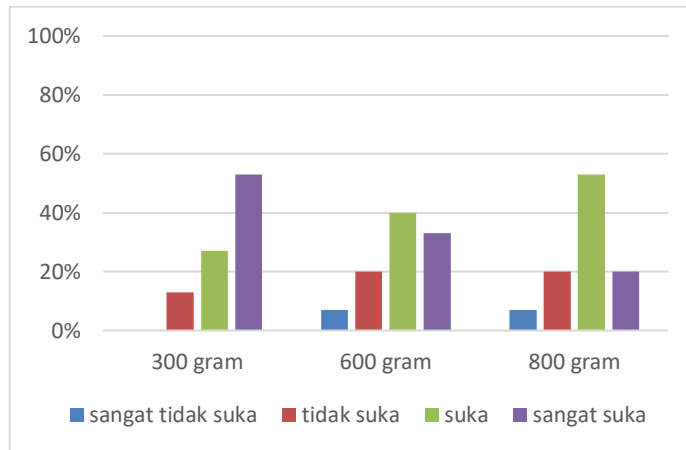
Taste is one of the crucial factors in the organoleptic test. The results of the organoleptic tests revealed that the panelists really loved the flavor of the finished tomato dates. The caramelization process used in cooking gives tomato dates their flavor (Bilang & Mustapa, 2016). Granulated and brown sugar are added to the tomatoes after they have been cooked over medium heat. Because tomato dates contain sugar, which gives tomatoes a sweet flavor, they are preferred. The composition of 300 grams of sugar and 600 grams of sugar differs noticeably, according to test results on the taste indicator. The panelists' preference levels for the sugar compositions of 300 grams and 600 grams, with a proportion of 80% genuinely liking them, are used to determine which flavor is the best.



Picture 2 Graph of Percentage of Liked Level of Sugar Composition Based on Taste Indicator

3. Texture

The processing of date tomatoes is influenced by their sugar content, and adding sugar to date tomatoes can maintain their flexibility and texture. Organoleptic test results revealed that the texture indicator in the sugar composition treatment had a significant impact, but panelist preference levels revealed that they preferred the 300 g sugar composition with a percentage of 53%, which is very similar to it in comparison to the other compositions. Granulated sugar penetrates into the tomatoes during processing, giving the finished product a velvety feel. Granulated sugar can permeate into the tomatoes and create a soft product texture, but when the tomatoes are dried, the sugar will crystallize once more, giving date tomatoes their hard texture. The panelists did not enjoy the date tomatoes' harsh texture, which increased with the amount of sugar employed.

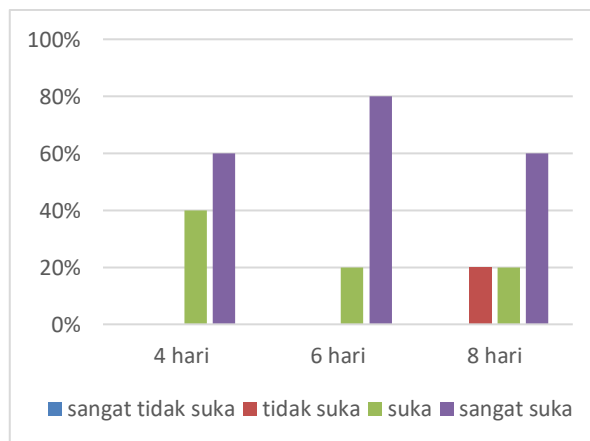


Picture 3 Graph of Percentage Level of Likeability of Sugar Composition Based on Texture Indicators

B. Lengthy Drying Period

1. Color

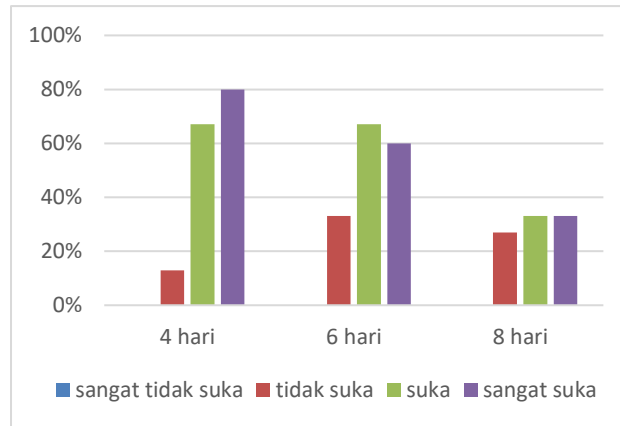
Color on dates has a percentage value that goes from 10% to 100% (from strongly disliked to very liked). The 6-day drying time treatment had the highest proportion, at 80% (really liked it), while the 3-day and 8-day treatments both had the same percentage, at 60%. The release of phenol reactions rises when the drying process is prolonged and sugar is added to dried candies, resulting in a reddish brown color. (Handayani et al., 2021).



Picture 4 Graph of Preferred Level of Drying Time Percentage Based on Color Indicator

2. Flavour

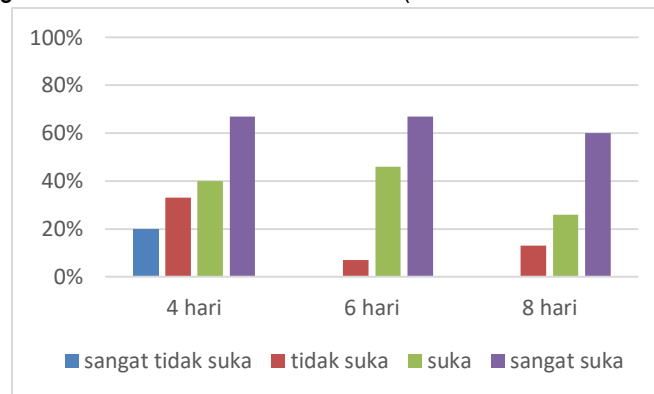
The tomato-date flavor's percentage value varies from 10% to 100% (from very despised to very liked). The 4-day drying time option yielded the greatest percentage value, 80%, which the panelists much preferred. The 8-day treatment produced the lowest average score, which was only 33% (very close). The caramelization process that turns sucrose into its distinct flavor helps to balance the fundamental ingredients' sour, bitter, and salty flavors to a greater extent as processing time increases. (Handayani et al., 2021)



Picture 5 Graph of Percentage Level of Favorite Drying Time Based on Taste Indicators

3. Texture

Date tomatoes have a percentage value that runs from 10% to 100% (from very detestable to very much liked). The long drying time treatment for 4 days and 6 days had the highest percentage value at 67% (very similar). While the lowest percentage, 60% (very like), was attained after an extended drying period of 8 days. The pectin molecule linkages that make the texture harder can be reduced by drying dried sweets for longer and making the texture harder when heated. (Wastawati & Marwati, 2019)



Picture 6 Graph of Preferred Percentage Level of Drying Time Based on Texture Indicators

CONCLUSION

According to the aforementioned research, the texture and color of date tomatoes are unaffected by the composition of the sugar, although there is a noticeable color variation between the drying times of 6 days, 3 days, and 8 days. The highest percentage score in terms of taste was likewise achieved with a drying duration of 6 days. The texture of date tomatoes did not, however, significantly vary with drying time. The duration of drying time, however, has an impact on the color and flavor of date tomatoes.

NOTE OF GRATITUDE

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