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The Influence of the Drying Process on the Quality of Lamtoro Seed Cruckers *(Leucaena leucocephala)*

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Abstract

This study aims to determine one of the lamtoro cracker drying treatments that can produce quality crackers. The research method used was a Completely Randomized Design (CRD) with 4 treatments and each treatment was repeated 3 times to obtain 12 experimental units. The treatments tried in this study were a) 1 day drying time; b) Drying time 2 days; c) Drying time 3 days; and d) 4 days drying time. The treatment was carried out simply randomly by drawing a lottery to avoid subjectivity in placing the experimental unit. The order of placement of the treatments on the trial plan is the order in which the experiment is carried out. The results showed that there was a very significant effect on color, aroma, texture and taste with a drying time of 2 days which was the best treatment so that it produced the best quality because it gave the impression of color, aroma, texture and taste that the panelists liked.

Keywords: *Lamtoro Seeds, Petay, Drying, Crackers*

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INTRODUCTION

Lamtoro gung or Chinese petai is a kind of shrub from*Fabaceae family* often used in reforestation or erosion prevention. Lamtoro leaves can also be used as a basic ingredient for liquid fertilizer, as stated by Hutubessy & Saraway (2018: 210) in their research results showing that liquid fertilizer for lamtoro leaves causes higher crop yields due to increased growth. Lamtoro gung comes from Central America, this plant has been introduced to Java for hundreds of years for agricultural and forestry purposes. This plant is a multipurpose plant because all parts of the plant can be used both for the benefit of humans and animals, for example the stems are used for fuel, the leaves can be used for animal feed or fertilizer while the young seeds are used as vegetables or crackers.

Alor Regency, especially in Aimoli Village, lamtoro seeds are a waste material which is quite common in various plantation locations and community agriculture, but so far these lamtoro seeds have not been used optimally by the village community. This is unfortunate because lamtoro seeds can be processed into vegetables or tempe raw materials and can also be processed into crackers. Lamtoro seeds also contain quite a lot of them; mimosin, leukanin, protein and leukanol. The high protein content makes old lamtoro mlanding seeds the potential to be used as a protein source. In 100 g of lamtoro mlanding seeds, it contains 24.14% protein (Alabi et al., 2009). Lamboro (*leucena leucocephala*) is one of the tree legumes that contains high protein and carotenoids which is very potential as non-ruminant animal feed such as poultry in the tropics. Mimosin is a group of amino acids and mimosin is found in the seeds and leaves of the leucaena species.

The protein content in lamtoro seeds which have nutritional value can be utilized and processed for consumption. One form of processed food that can be done is processing lamtoro seeds into crackers. Crackers are one of the traditional processed products that are favored by the people of Indonesia, these foods are well known at all ages and social levels of society, easily obtained and sold at low prices, both in packages that have been fried or in packages that are still raw, crackers have a unique texture. crunchy and crunchy which can be consumed as a snack or as a variation in side dishes (Ariyani, N. 2010). The shape and taste of crackers varies depending on the basic ingredients used and the area of origin of manufacture.

Processed food products have several characteristics that distinguish one product from another and can even differentiate products from the same raw material depending on the processing method. This can be seen and felt from the color, aroma, texture and taste. Food products with different textures have different response values when subjected to pressure. Changes in the properties that occur in these foodstuffs will experience different texture quality measurements in food products (Adnan Engelan, 2018: 11).One of the food ingredients that is often added coloring agent is crackers. There are various kinds of crackers according to the taste, shape and origin of the region. As a type of snack, crackers contain starch which is quite high. Colored crackers that are suspected of using dyes that are prohibited for food (dyes for textiles) are currently circulating in society (Rahayu & Mahmuda, 2016:56)

For this reason, it is necessary to process food products naturally using the drying method. Drying is a way to remove some of the water from a material by using heat energy. The advantage of drying is that the material is stored longer and the volume of the material becomes smaller. The drying process aims to reduce the water content in the crackers so that it can inhibit microorganisms and enzyme activity that can cause spoilage so that the dried crackers have good quality and can be stored for a long time, while the drying process for the nutrient content and organoleptic conditions of lamtoro seeds still needs to be processed into products. food, because of that the author deems it necessary to conduct research with the title**"The effect of the drying process on quality**s **lamtoro seed crackers*(Leucaena leucocephala)*". ** With the aim of knowing one form of drying treatment that can improve the quality of good crackers.

RESEARCH METHODS

Types and Research Locations

This research will be carried out in May - June 2022 at the Laboratory of Agricultural Technology (THP) Tribuana University, Kalabahi.

Tools and materials

1. Tool

The tools used in this study were scales, blenders, measuring cups, basins, stoves, pans, banana leaves, stirrers, knives, rulers and stationery.

2. Material

The main ingredients used in this study were raw lamtoro seeds (easy), tapioca flour, wheat flour, salt, onions, coriander, turmeric and clean water.

Data Collection Sources and Methods

1. Research Preparation Stage

The initial step that must be taken before conducting this research is the preparation stage, namely collecting lamtoro seeds that are still raw taken from the tree and allowed to stand for 7 days before the treatment is carried out, collecting seeds after 7 days before planting is chosen because on the seventh day the ripe seeds are completely dry and is optimal for multiplication. The lamtoro seeds used come from the same tree and the part of the seed taken is the one in the middle of the row of seeds.

2. Research implementation stage

a. Prepare 900 grams of lamtoro seeds that have been peeled
b. The washing process is to remove the dirt that sticks to the lamtoro seeds.
c. Prepare additional ingredients, namely:
d. garlic 10 cloves
e. 2 tbsp coriander
f. 900 ml of water
g. Refinement process

Cut the lamtoro seeds into smaller sizes then mix the three ingredients to blend

a. Mix other additional ingredients to make the dough:
b. 1000 gr tapioca flour
c. 1000 gr of flour
d. 2 tbsp fine salt
e. 2 tbsp turmeric powder

then shape the dough according to taste for the steaming process

a. Steaming process

Prepare a pot that already contains enough water to heat the water until it boils, after the water boils, add the dough that has been wrapped using young banana leaves and steam the dough for 2 hours

b. After cooking, lower it into the tray to cool for 15 hours until completely cold, then slice according to taste

c. Carry out the drying process using sunlight according to the packaged treatment, then carry out the analysis of organoleptic tests on texture, color, aroma and taste.

Research design

1. Experimental design

This study used a completely randomized design (CRD) with 4 treatments and each treatment was repeated 3 times to obtain 12 experimental units. The treatment that was tried in this study was

a) Drying time 1 day
b) Drying time 2 days
c) Drying time 3 days
d) Drying time 4 days

2. Method mathematics

The mathematical model of Completely Randomized Design (CRD) is as follows:

$\mathbf{Ijj = \mu + Ti + \sum} ij$

Where :

Yij = Observation Value

m = Average Value

Of = Influence of Treatment
∑ij = Trial Error
i = Treatment
j = Connected

3. Randomization and Experimental Scheme

All experimental units were placed randomly using a lottery draw to avoid subjectivity in the placement of experimental units. The order of placement of the treatments on the trial plan is the order in which the experiment is carried out. The randomization results and the experimental layout are as follows:

Table 1. Results of Randomization and Experimental Layout

1 A1	2 B2	3 A3
4 C1	5 A2	6 D2
7 B1	8 C2	9 D1
10 C3	11 D3	12 B3

Information:

- Letters A, B, C and D, are the treatments tried
- The numbers next to the letters are repeats
- The numbers 1 to 12 in the left corner of the column are the order of the experiment.

Sensory Test (Organoleptic)

The variables observed in this study were the color, aroma, texture and taste of the lamtoro seed crackers. This observation involved 15 panelists consisting of 15 students from the Agricultural Product Technology Study Program, each panelist gave an assessment of the impressions related to the organoleptic properties of the organoleptic results of color, aroma, texture and taste. Several research characteristics based on the determination of 15 people. The number of panelists to provide ratings/scores, as shown in the organoleptic test criteria table.

Table 2. Organoleptic Test

Color	Aroma	Texture	Feel	Score
Very Yellow	Very special	Very crunchy	So salty	4
Yellow	Special	crispy	Salt	3
Less Yellow	Less special	Less crunchy	Not salty	2
Not Yellow	Not special	Not crispy	Not salty	1

Data analysis

The data obtained were analyzed using analysis of variance (ANOVA) to determine the effect of treatment and continued with Duncan's Multiple Range Test to determine whether there were differences between treatments (Sugiyono, 2016).

RESULTS AND DISCUSSION

The results of the study focused on the results of organoleptic tests on color, aroma, texture and taste on the quality of lamtoro seed crackers. Organoleptic tests are carried out to determine the quality of a product or material that causes a person

to accept it or not. Factors that affect the acceptance of a food. This study involved 15 panelists with somewhat skilled criteria. At the assessment stage, the panelists fill out an assessment sheet (questionnaire) then the results are calculated.

Color

Determination of the quality of food ingredients in general is more dominated by visual factors by looking at color. An ingredient can be judged nutritious, delicious, and has a very good texture, not eaten if it has an unsightly color that gives the impression that it has deviated from the color it should be.(Winarno, 2012).

The treatment with the highest level of preference for the color of the lamtoro seed crackers is the treatment with the addition process, namely treatment B. With a drying time of 2 days it can affect the color, namely the color becomes bright yellow. From the results of D. From the results of the analysis of diversity (ANOVA) on the color of the crackers it has a very significant effect (F.hit> 1%) on the color of the lamtoro seed crackers. The average color value in lamtoro seeds can be seen in the image below.

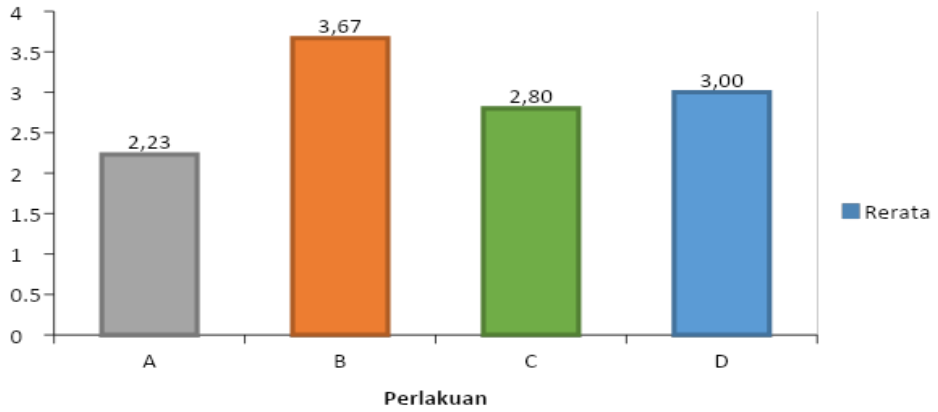

Figure 1. The average level of preference for the color of lamtoro seed crackers

From the results of Duncan's Multiple Range Test, it shows that there are differences in color preference. The highest color preference was found in treatment B (3.67), which was calculated from the assessment of the bright yellow panelists with a score of 4 which was significantly different from treatments A, C, and D. The lowest color preference was found in treatment A, which was significantly different from B, C , D. The highest average was in treatment B with the addition of natural color which is to show an attractive color in lamtoro crackers because flour without addition produces a faded yellow color.

Aroma

Aroma is an added value to a product by smelling the aroma one can know the deliciousness of a product. The treatment with the highest average level of preference for aroma is the treatment with the addition process. Treatment B is to give a distinctive aroma to lamtoro seeds. From the results of the panelists, treatment B was preferred so that it had the highest score and was the best treatment, while treatments A, C and D. From the results of the analysis of diversity (ANOVA)

on aroma, the effect was very significant (F.hit> 1%). The average value of aroma in lamtoro seed crackers can be seen in the image below.

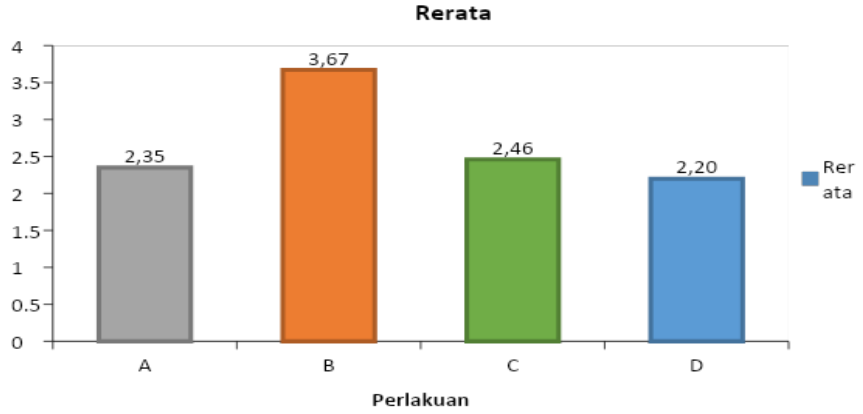

Figure 2. The average level of preference for lamtoro seed crackers

From the results of Duncan's Multiple Range Test, it shows that there are differences in preference for aroma. The highest preference for aroma was in treatment B (3.67) which was calculated from the panelist's assessment, the distinctive aroma of lamtoro seed crackers had a score of 4 which was significantly different from treatments A, C, and D. The lowest flavor preference was found in treatment D which was significantly different from A, B, and C.

Texture

The texture of the lamtoro seed crackers can be tested by feeling or touching. Texture is one aspect of the assessment in product appearance. Texture sensing varies, including wetness, dry, hard, rough and oily. The treatment with the highest level of preference for the texture of lamtoro seed crackers with the highest average was treatment B which gave a distinctive aroma to lamtoro seeds. From the results of the panelists, treatment B was preferred so that it had the highest score and was the best treatment, while treatments A, C and D. From the results of the analysis of diversity (ANOVA) on the texture of lamtoro seed crackers, the effect was very significant (F.hit> 1%). The average texture value of lamtoro seed crackers can be seen in the image below.

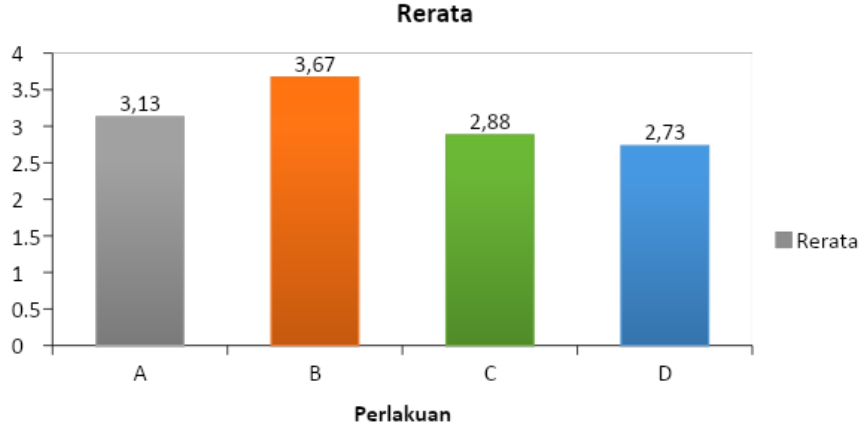

Figure 3. Average texture preference level for lamtoro seed crackers

From the results of Duncan's Multiple Range Test, it shows that the average value indicates that there is a difference in texture preference. The highest texture preference was found in treatment B (3.67) which was calculated from the panelists' assessment, very soft texture had a score of 4 which was significantly different from treatments A, C, and D. The lowest texture preference was found in treatment D which was significantly different from A, B, and C

Feel

Taste is the response of the nervous senses such as sweet, bitter, sour and salty. The taste of the product is very influential on one's preferences. From the results of the study the average value produced on lamtoro seed crackers had the highest level of preference in treatment B, namely giving a taste to lamtoro seed crackers. From the results of the panelists, treatment B was preferred so that it had the highest score and was the best treatment, while treatments A, C and D. From the results of the analysis of diversity (Anova) on the taste of lamtoro seeds, the effect was very significant (F.hit> 1%). The average value of aroma in lamtoro seed crackers can be seen in the image below.

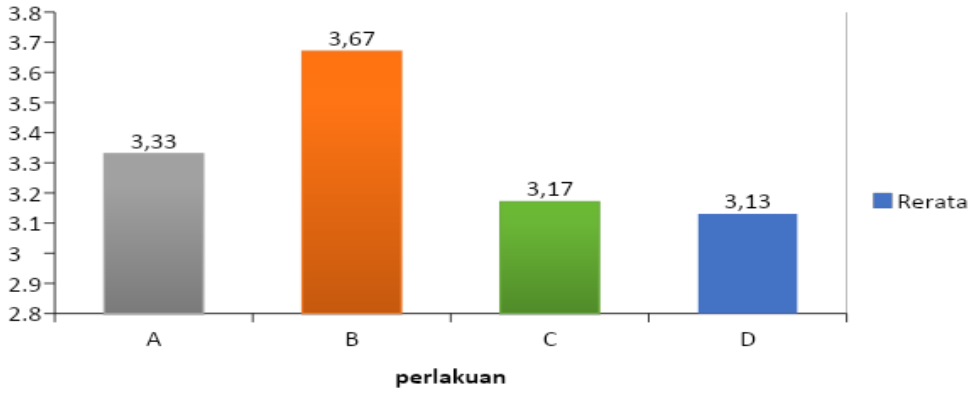

Figure 4. The average level of preference for lamtoro seed crackers

From the results of Duncan's Multiple Range Test, it shows that the average value indicates that there is a difference in the taste preferences of each panelist. The highest taste preference was found in treatment B (3.67) which was calculated from the panelist's assessment, very mild taste had a score of 4 which was significantly different from treatments A, C, and D. The lowest taste preference was found in treatment D which was significantly different from A, B, and C

Conclusions and suggestions

The knot

Based on the results of the analysis and discussion of the effect of adding lamtoro seed crackers on the quality of the crackers, the following conclusions can be drawn:

1. There is an influence of the drying process of the lamtoro seeds on the quality of the crackers in terms of color, aroma, texture and taste.

2. Drying time of 2 days is the best treatment so that it produces the best quality because it gives the impression of color, aroma, texture and taste that the panelists like with each product characteristic consistent with an average value of 3.67.

Suggestion

Based on the conclusions above, the authors suggest that:

1. Further research is needed, namely testing the water content and storability of the best treatment, namely drying for 2 days.
2. For researchers it is hoped that this research can be useful and contribute in managing local materials that are not valuable into products that have economic value.

BIBLIOGRAPHY

Adnan Egelan. 2018.*Analysis of Hardness, Moisture Content, Color and Sensory Properties in Making Moringa Leaf Chips*. Journal Of Agritech Science, Vol 2 No1, May 2018.

Ariyani, N. 2010.*Formulation of Ready-to-Use Mixed Flour Based on Tapioca – Mocaf with the Addition of Moltodextine SDE as a Coating Powder for Spinach Crackers.* Essay. Journal of Processing of Agricultural Products.

Anonymous. 2011.*Chinese map*. http://theresaldita.blogspot.com/2011/03/ norm al -0-false-false-false-in-x-none-x.htm.

Daily, A. 2013.Medicinal Plants and Their Benefits. Self-help Spreader. Jakarta. pg 261.

Jossiana I.B Hutubessy & Virgil Sarawai.2018. *Utilization of Lamtoro Leaves (Leucaena leucocephala) As Liquid Organic Fertilizer on the Growth and Yield of Peanut Plants (Arachis hypogaea L.)*. http://fkptpi.unsyiah.ac.id.Proceedings of the 205 Indonesian Agricultural Higher Education Communication Forum (FKPTPI) 2018 Syiah Kuala University Banda Aceh.

in Khoirunn.R, Maharani.P & Yasmin Aulia Rachma. 2022.*Changes in Radicle Length and Nutritional Content of Lamtoro Mlanding Seeds During Germination [Leucaena leucocephala (Lam.) de Wit]*. Journal Agrifoodtech. Vol 1. After 2 December 2022.https://www.researchgate.net/deref/https%3A%2F%2Fjurnal2.untagsmg.ac.id%2Findex.php%2Fagrifoodtech

Laconi, E, B. 2010.*Xontafil Content of Lamtoro Leaf Results of Mimosin Detoxication Physically and Chemically*. Farming media. Jakarta.

Lim, T, K. 2012. *Edible Medicinal and non-medicinal plants*, volume 2 : fruits. http://link.spiringer.com/book/10.1007/978-94-007-1764-0/page/5html. accessed on 25 april 2017.

Mutia, H, N., & I, N. 2010.*The Effects of Tapioca, Wheat, Sago And Patato Flours On The Physicochemical And Sensory Properties Of Duck Sausage. International Food Research Journal*: 877-884.

Nurul, Q., & Deny, U. 2016. *The Effect of Adding Lamtoro Gung (Leuceana leucocephala) Seeds on Tempeh Fermentation Process. Journal of Food Technology*, 7(1), 2016

Smith, A, K., Kumar, S. 2013.*The Scientific Word Juonal. Chemistry and biological activities of flavonoids: an overview*.

Rahayu, M., Mahmuda, I, Y. 2016.*Identification of Rhodamine B and Methanyl Yellow Dyes in Crackers Sold at Beringharjo Market, Yogyakarta*. Journal of Laboratory Technology Vol.5 No.2, September 2016.www.teknolabjournal.com.

Sinurat Ellya and Mukyati. 2014.*Effect of drying time and temperature on the quality of jelly candy.* JPB Fisheries Vol. 9 N0. 2 Year 2014: 133-142.

Sumada K., Dewaati, R., Suprihhatin, S., 2016.*Industrial salt made from krosok salt with washing and evaporation methods*. Only. Who. 11th.

Sugiyono. 2016.*Quantitative Qualitative Research Methods and R&D.* Bandung: Alphabet.

Zoer'aini djaal irwan. 2013.*Environmental Ecology*. Print II. Jakarta