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INNOVATION OF ACEH SPECIAL DRYING SPICES WITH THE ADDITION OF BLOWER FOR BUSINESS DEVELOPMENT IN BLANG POROH VILLAGE, MUARA DUA DISTRICT

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ABSTRACT

The spices that are usually available in the Aceh market itself are still wet, therefore special processing is needed to create instant seasoning powder that is easy and practical in its presentation. This community service activity aims to provide solutions to partners in processing instant cooking spices from Acehnese spices. The technology used is Drying Blower Oven Technology as an easy, practical cooking spice processing technology made from natural spices. RECEH (Rempah Khas Aceh) product will also be carried out requirements worthy of being seen by testing, such as nutritional content tests, ash content tests, water content tests, organoleptic test to match product marketing standard. This dedication is expected to improve the economy of spice farmers and also introduce Acehnese specialties to various regions domestically and abroad. The result of this dedication resulted in innovative products RECEH (Rempah Khas Aceh), simple patents, and product trademarks.

Keywords: Technology, Instant seasoning powder, Spices.

INTRODUCTION

Spices are types of plants that have a strong taste and aroma and function as spices and flavor enhancers in food. Besides being used in cooking, spices can also be used as medicine and raw materials for herbal medicine. Paying attention to the benefits, it is not surprising that spices are one of the commodities that have high economic value. In fact, in colonial times, the main reason why colonists, especially from several countries on the European continent, explored other continents was to find spice-producing countries. This was done because of the high economic value of spices in Europe at that time and the potential income that could be generated (Regional news, 2014). Commodities included in the spice category include: pepper, nutmeg, vanilla, cinnamon, cloves and ginger.

Picture 1. Aceh Signature Spices

Indonesia is the world's spice producer so that colonizers, especially from the Dutch, Portuguese and British came in droves to Indonesia. According to data released by the Food and Agriculture Organization (FAO), Indonesia was ranked first in the world vanilla and clove producers and ranked 2nd in the world pepper and nutmeg producers in 2014 (FAOStat, 2016).

Culinary is one of the cultural results that is closely related to Indonesian society, where the country is known to have a variety of ethnis and cultures that are different from each daeerah. Because apart from the main function of food ingredients as fulfillment of basic needs, culinary also has historical and even philosophical values. Authentic culinary is one type of community creativity in processing food ingredients and adding value to traditional culinary culture.

One of them is the Acehnese people who have culinary that is very attached to the hearts of consumers both domestically and abroad, namely Aceh Noodle. The seasoning of Aceh noodles can be easily obtained in the local market, but for consumers who are outside Aceh itself it is difficult to process and make into Aceh noodles with a taste that is not lost from its cuisine. There are several supermarkets or local markets located in areas outside Aceh opening branches in making Aceh noodles itself. However, there is a lack of taste, so special processing is needed in processing the Aceh noodle seasoning into Aceh noodle seasoning in practical conditions and easy to serve and can be easily carried to travel anywhere.

The purpose and benefits of implementing products through this community service program are the first is to make it easier for foreign or domestic people to be able to taste food with a distinctive taste from the Aceh region which is packaged in powder form, practical and fast in its presentation can also extend shelf life. For this reason, through this program, the proposer tries to produce and develop campus products in the form of instant spices derived from spice plants as local products to become one of the national superior products to help farmers and the community in increasing the productivity of spice plants that have large economic prospects in Tambon Tunong village, Dewantara District, North Aceh Regency.

The target to be achieved in this Community Service Program is to increase the productivity and effectiveness of the growth of spice plants to produce quality spices and can improve the economy in the local and world markets and help establish cooperation between farmers and consumers in an effort to increase the availability of spice plants. Improvements in the field of drying processes of spices in accordance with its standards.

The main target of this activity is the creation of spare change products that can be marketed in national and international markets. In addition, in this program, the planned output achievement targets are as follows:

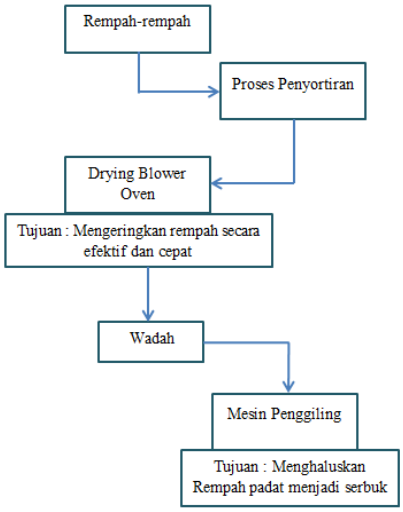
a. Increase income for the community and partners with the proceeds from the sale of instant seasoning products typical of the local area.
b. Increase the quantity and quality of instant seasoning products.
c. Increase community understanding and skills in the field of instant seasoning processing to become a superior product of the community and partners.

METHOD

This study used a drying blower oven with Type Multioven Cabinet measuring 140 x 90 x 170 cm. The heat source is obtained from electricity. Oven temperature ranges from 50-80°C. The

number of tray 30 with a distance between trays is 7.3 cm with a capacity of ± 10-20 kg depending on the material to be dried. The ingredients used are red chili, onion, garlic, tamarind, hazelnut, coriander, cardamom, and pepper.

Picture 2. Drying Blower Oven



Picture 3. Flow diagram of the Application of Drying Blower Oven Tools in Drying.

Drying oven blowers are an upgraded version of the oven. An oven is a set of drying machines as a substitute for sunlight in drying a product. The working system of this drying oven machine is to dry the product at the desired temperature (the temperature can be set constantly)[4]. The drying system of this machine uses a stream of hot air at high speed, with the help of a blower of saturated air sucked in and flowing out. The drying system with this drying machine is called drying by artificial heating (artificial drying).

Drying with artificial heating has several types of devices in which heat transfer occurs by conduction or convection, although some can be with radiation. Dryers with convection heat transfer generally use hot air flowed, so that the heat energy is evenly distributed throughout the material. Dryers with conductive heat transfer generally use solid surfaces as heat conductors. One of the drying materials that are often used on an industrial scale is an electric oven. The working principle of this tool is to reduce the water content of the material by flowing heat from the element (which converts from electrical energy to caloric energy) with air media. On a commercial scale of the food industry, electric ovens are set at a speed of 2.45 x 10 rps [4]. Heating is obtained from the movement of particles caused by alternating current (AC current), besides electric ovens are often used as drying devices for laboratory purposes because they can be used for moisture research methods of several different materials. Therefore, electric ovens are categorized as cabinet dryers.

Drying done mechanically, namely by using artificial drying devices (artificial drying) can facilitate controlling factors in the drying process. Air temperature regulation, for example, can result in a much more homogeneous and regular product when the dryer air temperature is set according to the properties of the material and the desired result. This blower drying oven is designed using food grade stainless steel. So, it is safe to use for foodstuffs. This blower drying oven is designed with 6 chambers, 6 blower fans and, 30 drying trays for a capacity of 10-20 kg of raw materials.

RESULT AND DISCUSSION

1. Product RECEH (Rempah Khas Aceh)

Gambar 4. Varian Bumbu RECEH

2. Material Weight Reduction

Table 3. The result of changes in the weight of ingredients in spices with high moisture content

Spices	T (ºC)	Time (hours)	Wet weight (kg)	Dry weight (kg)	Lost (kg)
Chilli	60	2	5	3,5	1,5
		3		3	2
	70	2	5	2	3
		3		1,5	3,5
	80	2	5	1	4
		3		0,9	4,1
Shallot	60	2	5	3	2
		3		2,9	2,1
	70	2	5	2	3
		3		1,2	3,8
	80	2	5	1	4
		3		0,8	4,2
Garlic	60	2	5	3,4	1,6
		3		2,9	2,1
	70	2	5	2	3
		3		1,5	3,5
	80	2	5	1	4
		3		0,9	4,1
Asam sunti	60	2	5	3,4	1,6
		3		2,9	2,1
	70	2	5	2	3
		3		1,6	3,4
	80	2	5	1	4
		3		0,7	4,3

Table 4. The result of changes in the weight of ingredients in spices with low moisture content

Spices	T (ºC)	Time (hours)	Wet weight (kg)	Dry weight (kg)	Lost (kg)
Candlenut	60	2	5	3,1	1,9
		3		2,8	2,2
	70	2	5	2	3
		3		1,5	3,5
	80	2	5	1	4
		3		0,8	4,2
Coriander	60	2	5	3,2	1,8
		3		2,9	2,1
	70	2	5	2,1	2,9
		3		1,6	3,4
	80	2	5	1	4
		3		0,9	4,1
Cardamom	60	2	5	3	2
		3		2,5	2,5
	70	2	5	1,9	3,1
		3		1,3	3,7
	80	2	5	0,9	4,1
		3		0,7	4,5
Pepper	60	2	5	3,3	1,7
		3		2,7	2,3
	70	2	5	2	3
		3		1,5	3,5
	80	2	5	1	4
		3		0,8	4,2

In Table 3 and Table 4, it can be seen that the experimental capacity of the dryer with a spice weight of 5 kg is dried for 2-3 hours. The working capacity of this dryer can be increased if the weight of spices is added, the working capacity can be increased if the amount / rate of rotation per minute is increased, because according to the results of the study it is stated that the amount of power can affect the processing process time and the capacity of the processing tool. In addition, spices can be added again when viewed from the length and diameter of the tray and this requires operator expertise in operating this tool.

In Table 3, yield loss occurs in spices that have high water content, it can be seen that the yield loss obtained at the best temperature is 70 ºC within 3 hours, with an average moisture loss rate of 70-75%. In Table 4 it can be seen that spices that have low water content obtained the best temperature in grinding which is 70 ºC within 2 hours, the average moisture loss rate is 60-65%, In addition, in the drying process that is too hot and long can cause damage to spices that have low water content. Based on tables 3 and 4 above, the

results of the analysis carried out for the water loss rate test are appropriate according to SNI 01-2974-1996 for this instant seasoning product, the moisture content should not exceed 8-10%.

3. Relative Humidity of Environmental Air and Dryer Air

The results showed that during the drying process, the relative humidity outside the dryer ranged from 83.28% - 89.50%. Also the relative humidity inside the dryer was observed and recorded in the range of 86.58% - 97.91%. The results of this observation both from wet and dry thermometers plotted on a psychometric chart then obtained data on humidity outside and humidity inside the drying room, there was a difference between the humidity outside the dryer was an average of 86.11% and the humidity inside the dryer was an average of 88.17%. This humidity occurs because the process energy produced by the fan that is fully opened at the speed of air entering the dryer averages 12 m / s which forcibly enters the drying chamber to touch the material convection in the drying chamber. The difference between the outside and inside humidity of the dryer creates space for the weight of water that evaporates from the material and then moves to the drying air.

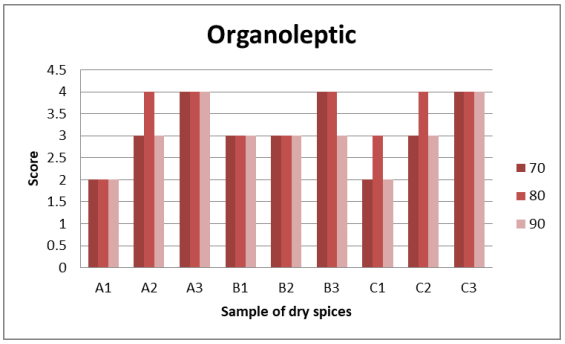
4. The Relationship of Water Content to Time

The decrease in water content in red peppers is relatively fast at the beginning of drying, then decreases slowly until it approaches the specified moisture content. Based on the results of the study, the minimum moisture content of red chili in rooms one and two reached 17.4%, rooms three and four 16.95% and rooms five and six 16.6%. Decreasing the moisture content of the material at the beginning of the study using the oven method, the results of the study obtained preliminary moisture content data was 60-85% at harvest (Mikasari 2016). This water content is used as initial data on the decrease in moisture content of the material as measured by the material weight weighing method after the drying process takes place, during the drying process the equilibrium moisture content continues to decrease by 8 - 10%. This decrease in water content is due to the drying process where agricultural red chili material absorbs heat energy from the drying air in the sense that there is a convection heat transfer process from the drying air which is absorbed by materials containing water by 38.75%.

Then the water evaporates slowly from the material to the drying air, this can be interpreted that when the evaporation process occurs, the nutmeg material from agriculture slowly loses its mass or in theory is called mass transfer. The water content in the material consists of 3 types of water, namely the first free water content, the second water content is bound to the material and the third is the water content that is chemically bound in the material this amount of water will evaporate after receiving or absorbing heat energy from the drying air. Initially, the water that evaporates is free water, then followed by bound water, then the last is chemically bound water. The difference in water content occurs due to the position of space, namely rooms one and two receive heat earlier, followed by spaces three and four and spaces four and five. In addition, there may be differences in the size of the material, there may even be differences in moisture content between one grain and another. No less important is the difference between the position of the material to the air flow rate and the amount of energy present in the drying air so that the moisture content is different.

5. Organoleptic Test

Organoleptic testing on spices aims to get an idea of the level of preference of panelists for the color, taste, and aroma produced.

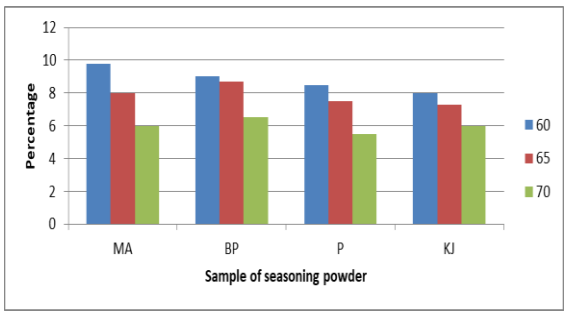


Picture 5. Color observation graph on high moisture content spice samples

The results of the observations in the graph above on the color, taste and smell of instant spice-based spices after washing and drying in this drying blower oven with temperatures of 60oC, 6oC and 80oC at a drying time of 3 hours. Given to 15 panelists, showing the highest scores of color, taste, and smell with a rating scale of 1-5 found in the MA, BP, P, and KJ treatments at a temperature of 70 oC average score of 4 (likes) and the lowest found in treatments A1, B1, C1 which is 2.3 (less) for A2, B2, C2 with an average score of 3 (likes). The difference in organoleptic values in color testing does not show such a big difference. All treatments were favored by the panelists on average with a score range of 2.5 – 4. The influence of the level of color preference on instant spices made from spices is influenced by the presence of compounds contained in these spices.

6. Ash Content Test

Determination of ash content has to do with the minerals of a foodstuff. Ash content is determined based on weight loss after combustion provided that the end point of combustion is stopped before decomposition of the ash occurs (Tahar et al., 2017). Making instant spices made from spices begins with making spice powder which is done by washing it thoroughly then drying using a drying blower oven for 2 hours with heating temperature. The dried ingredients are mashed using a blender and sifted using a 60 mesh sieve. Based on SNI 01-3709-1995, the maximum permissible ash content is 7%.



Picture 6. Ash content observation graph on instant seasoning samples

The results of ash content testing on instant spices made from spices show the highest value is found at a temperature of 70 ° C with an average ash content of 5.5% to 6.5% and this result is in accordance with SNI standard 01-3709-1995 the maximum allowed ash content is 7%. The results of fingerprint analysis showed that the treatment had a very real effect (α = 0.01) on increasing the percentage of spice ash content. An increase in the percentage of ash content is inversely proportional to an increase in the percentage of moisture content in seasonings. The lower the water content, the higher the spice ash content. The higher the temperature in the processing process, the percentage of ash content will increase because the water coming out of the food will be greater.

CONCLUSION

Increase the productivity and effectiveness of the growth of spice plants to produce quality spices and can improve the economy in the local and world

markets and help establish cooperation between farmers and consumers in an effort to increase the availability of spice plants. Improvements in the field of drying processes of spices in accordance with its standards. The method is carried out using a drying blower oven that has previously been prepared by the proposer.

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