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AUTOMATIC DRYER FOR DRYING RHIZOMES IN THE PUSPASARI WOMEN FARMERS GROUP

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Abstract

One form of community service is the transfer of technology from universities to community groups. The Puspasari Women's Farmers Group (KWT) has a medicinal plant garden that produces medicinal plants, one of which is rhizomes. One of the shortcomings of drying the rhizomes is the drying process which is still conventional, this causes the quality of the rhizomes to be poor. The purpose of this service is, with the presence of an automatic dryer owned by the agricultural engineering study program of Ibn Khaldun University, it is hoped that there will be an increase in product quality and an increase in the understanding of KWT members regarding drying. After the implementation of the dryer training, training participants were given questionnaires and questions. As a result, the participants stated that the drying results with the automatic drying tool were much better than conventional drying. Participants were able to answer 60% of the questions given regarding basic drying knowledge.

Keywords: Community Assistance, Drying, Transfer Technology

INTRODUCTION

One of the small home industry players in Bogor City is the Puspasari Women Farmers Group (KWT) which was established in 2011 in RW 07, Kedung Badak Village, Tanah Sareal District, Bogor City. The activities carried out so far are the cultivation of food crops and herbal plants and their processing into herbal drinks. KWT Puspasari has a management program for seed gardens and medicinal plant trial gardens planted with more than 100 types of medicinal plants that are processed into Family Medicinal Plants (Toga) and herbal drinks. Beverage products that have been produced by KWT Puspasari include lemon water, fruit juice, lemon mint leaf tea, soy milk, and herbal medicine. In one day, KWT produces 20 to 30 bottles of drinks for each variant. Figure 1 shows the medicinal plant garden at KWT Puspasari.

KWT Puspasari plans to produce instant powdered herbal medicine as one of its superior products by utilizing the abundant fresh rhizomes from the garden. To produce instant powdered herbal medicine, good drying technology is needed so that the product quality is good and can be stored for a long time without preservatives. The drying process is one of the important factors that affects the shelf life of a food ingredient, because the drying process can

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affect the physical, texture, aroma and taste of the food ingredient . Drying is the process of transferring heat to move water from inside the material to outside the material [2]. One form of practical drying tool is a rack-type dryer. Rack-type dryers can dry agricultural materials without depending on the weather and are free from dirt and dust [3]. One of the weaknesses of rack-type dryers is the uneven temperature in the rack [4]. Rack-type dryers need to be equipped with temperature control devices so that temperature distribution can be achieved [5]. The purpose of this community service is to improve the knowledge and skills of KWT Puspasari in using dryers.

Figure 1. KWT Puspasari Garden in Bogor City

METHOD

The stages of community service are socialization, training, technology application, and evaluation. The socialization stage includes educating about the importance of drying rhizome plants. The training stage focuses on handling rhizomes before and after drying. In the application of technology, members of the Puspasari KWT will be taught how to use a dryer that has automatic control. The dryer is an applied technology created by the Agricultural Engineering and Biosystems Study Program, Ibn Khaldun University, Bogor. The drying tool is complete. Figure 2 shows the dryer that will be used by the Puspasari KWT to dry the rhizomes. The dryer already uses PID temperature control which will maintain the desired temperature. For drying rhizomes, the temperature used is 600C [6]. The training activities are carried out in two stages, namely the preparation and treatment of drying raw materials and the use of the dryer as carried out by [7]. In supporting the independent campus learning activities, we involved two students for this activity.

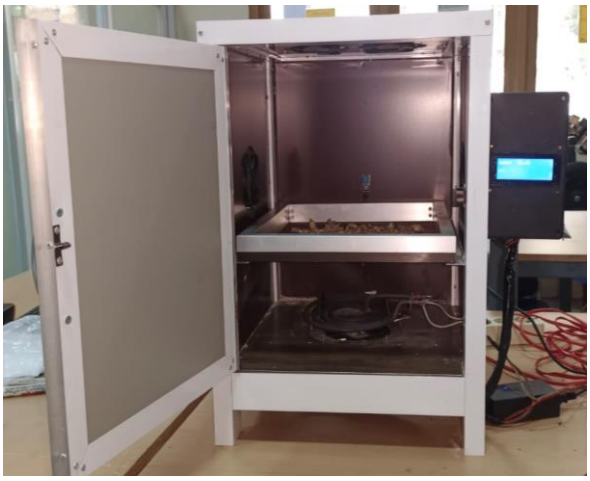

Figure 2 Automatic dryer

The evaluation stage was conducted to measure the success of community service in KWT Puspasari. The evaluation conducted was to provide a list of questions regarding training and knowledge of rhizome drying. The questionnaire consisted of two types of questions, namely questions regarding the level of satisfaction with the presentation of the material we provided and regarding the level of understanding regarding the use of drying tools and basic knowledge of drying. There are five value scales in the questionnaire. For the first type of questionnaire, the scale used is the Likert scale, where respondents choose the level of agreement during the training. The rating scale is used for the type of question in the second type of questionnaire, where respondents will be asked about knowledge of rhizome drying. The expected objectives of this training are to improve post-harvest skills, especially the use of medicinal plant drying tools and to improve the quality of rhizome drying with automatic drying machines. Figure 3 shows the activity evaluation questions and questionnaire.

1. Sejauh mana Anda memahami konsep pengeringan bahan untuk jamu dan minuman setelah pelatiaan		
☐ Sangat Paham	☐ Paham	☐Cukup Paham
☐ Kurang Paham	☐ Sangat Kurang Paham	
2. Apakah materi yang disampaikan berguna bagi KWT Puspasari ?		
☐ Sangat Berguna	☐ Berguna	☐ Cukup Berguna
☐ Kurang Berguna	☐ Sangat Kurang Berguna	
3. Apakah materi pelatihan menjelaskan proses pengeringan secara lengkap dan mudah dipahami?		
☐ Sangat Jelas	☐ Jelas	☐ Cukup Jelas
☐ Kurang Jelas	☐ Sangat Kurang Jelas	
4. Apakah materi pelatihan menjelaskan proses pengeringan secara lengkap dan mudah dipahami?		
☐ Sangat dipahami	☐ dipahami	☐ Cukup dipahami
☐ Kurang	☐ Sangat Kurang dipahami	
5. Apakah materi pelatihan menjelaskan proses pengeringan secara lengkap dan mudah dipahami?		
☐ Sangat dipahami	☐ dipahami	☐ Cukup dipahami
☐ Kurang	☐ Sangat Kurang dipahami	
6. Menurut anda, apakah pengeringan tanaman obat dan minuman bisa menaikkan nilai mutu dari produk?		
☐ Sangat bisa	☐ bisa	☐ Cukup bisa
☐ Kurang bisa	☐ Sangat Kurang bisa	

1. Di bawah ini yang BUKAN merupakan fungsi dari pengeringan adalah?		
☐ Menambah Rasa	☐ Menambah umur simpan	☐ Kontrol Kualitas
☐ Pengawetan Senyawa aktif hebal	☐ Menaikkan Kualitas	
2. Suhu untuk mengeringkan rimpang adalah ?		
☐ 30°C	☐ 40°C	☐ 60°C
☐ 90°C	☐ 100°C	
3. Tanda-tanda jahe telah selesai dikeringkan adalah		
☐ Tekstur menjadi keras	☐ Berat jadi ringan	☐ Kadar air 10%
☐ bau jahe menghilang	☐ Warna jahe cokelat kuning	
4. Tanda-tanda jahe telah selesai dikeringkan adalah ?		
☐ Tekstur menjadi keras	☐ Berat jadi ringan	☐ Kadar air 10%
☐ bau jahe menghilang	☐ Warna jahe cokelat kuning	
5. Yang Bukan keuntungan dari mengeringkan jahe dengan alat pengering ?		
☐ Mempersingkat waktu pengeringan	☐ Melindugi dari debu kotoran dan serangga	☐ Pengendalian suhu yang lebih baik
☐ Dapat dilakukan di waktu hujan dan malam hari	☐ Penggunaan energi tambahan	
6. Berikut ini yang Bukan merupakan persiapan sebelum mengeringkan jahe adalah ?		
☐ Memilah jahe yang baik	☐ Pencucian	☐ Pencacahan
☐ Pengupasan	☐ Pemotongan	
7. Jelaskan kenapa susunan jahe dalam alat pengering tidak boleh menumpuk ?		
8. Jelaskan kenapa setelah dikeringkan, jahe perlu di dinginkan terlebih dahulu		

Figure 3 Evaluation questionnaire

RESULTS AND DISCUSSION

Preparation of raw materials for rhizomes is done by demonstrating the treatment that must be done before drying. Figure 4 shows the drying training activities at the Puspari Women Farmers Group (KWT). There were 16 participants in the community service activities, most of whom were women.

Figure 4 Rhizome drying training at KWT Puspasari

Figure 5 shows the graph of the results of the first type of questionnaire or questions regarding the level of satisfaction with the training. Of the six questions we gave, the average respondent answered on a scale of five, four and three. Respondents generally understand the material provided. Respondents understand the concept of drying given by the speaker. Members of KWT Puspasari are female farmers who live in urban areas who generally have

higher education, so training and providing material on drying will be easier to convey. Respondents stated that drying rhizomes would be useful for KWT Puspasari. Agricultural products that are dried with temperature control will give better results compared to conventional drying. Dried rhizomes are brewed and compared to rhizomes that are dried conventionally. Rizikit et al [5] proved that temperature and humidity control can increase the quality of rhizomes and temulawak. This is because agricultural products get the right temperature.

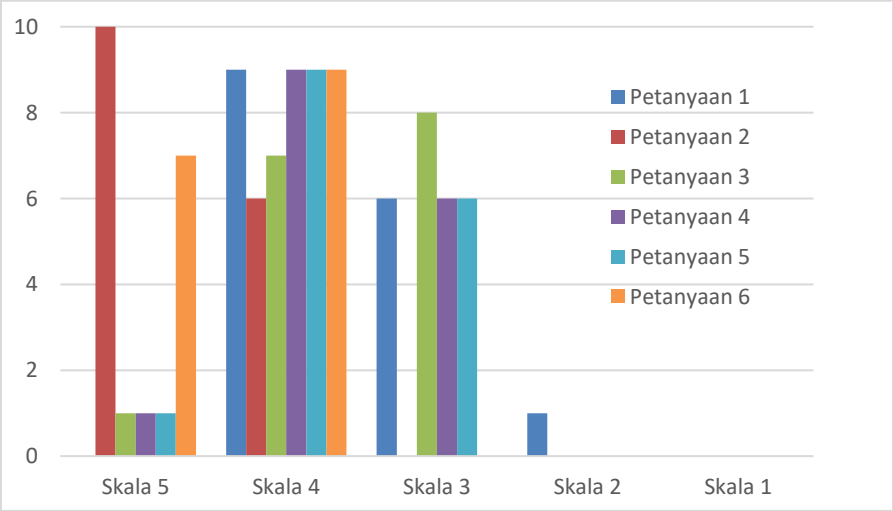

Figure 5 Training satisfaction questionnaire scale table

The training participants directly brewed the dried rhizomes with an automatic controlled drying machine, and they said that the dried rhizomes tasted better than conventionally dried rhizomes. Respondents gave a scale rating of 5 and 4 when asked whether automatic drying of rhizomes could increase the quality and value of the product. Training participants believed that dried rhizomes could be sold at a higher price. The dried rhizome products could be healthy drinks and herbal medicines. Erwin et al [8] conducted a drying technology transfer that could increase the selling value of dried products. The second questionnaire in the form of questions regarding drying knowledge was given to respondents using a rating scale. The average answer value was 5 out of 8 questions. Figure 6 shows the distribution of correct answers. Generally, respondents knew the rhizome processes before drying. This is because they are used to handling food. Drying tool training is considered to be able to provide a basic understanding of drying and help improve the welfare of farmer groups [9].

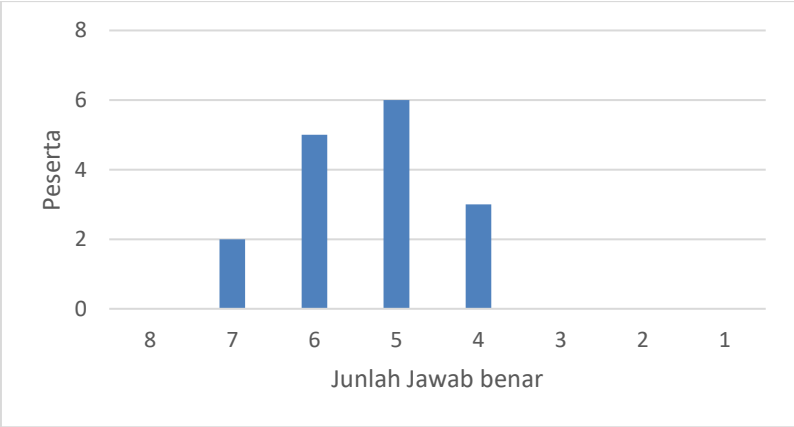

Figure 6 Distribution of the number of correct answers

CONCLUSION

The Drying Training conducted at the Puspasari Women Farmers Group went smoothly. The level of understanding of the automatic drying tool of KWT Puspasari angora increased. On average, training members were able to answer 5 out of 8 questions given. The quality of the rhizome product increased after being dried with an automatic dryer as evidenced by the brewing of the dried rhizome.

Acknnowlegement

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