Ann PUBLISHER
Journal of Community Services
e-ISSN: XXXX-XXXX
p-ISSN: XXXX-XXXX

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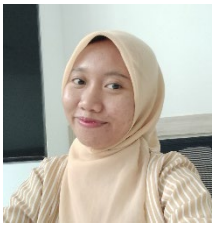

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INTRODUCTION TO SIAMESE ORANGE PROCESSING METHOD IN ORDER TO AVOID BITTER TASTE

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Abstract: Sumbersekar is part of Dau Regency, which is a region famous for the production of fruits, vegetables, and flowers because it is located in a high area with a cold climate. Sumbersekar region has a variety of agricultural products, including superior vegetables and fruits. One of the leading products is Siamese orange (*Citrus nobilis*). The problem that farmers must face is that the selling price of Siamese orange honey often drops during the high harvest season, which frequently harms farmers. When the selling price drops, many oranges are left on the tree and unprocessed due to the unknown processing technology of the oranges. One of the efforts to overcome excess unsold harvest is to carry out post-harvest processing. Processed processing of Siamese honey is an alternative process because it is easy. However, the weakness of processing oranges made by domestic scale industries is that they still have a bitter taste so consumers do not like them. Therefore, introducing citrus processing methods to avoid bitterness must be promoted so that their products have good competitiveness in the market. The solution provided by the UB team is to provide training activities on how to produce good processed citrus products and introduce good packaging technology. Thus, farmers in Sumbersekar Village can improve the quality of their processed Siamese citrus products and compete better in local and regional markets. This will help increase farmers' incomes and reduce losses as the selling price of oranges falls during high harvests.

Keywords: Siamese honey orange, Sumbersekar, processed production

INTRODUCTION

Sumbersekar Village, Dau District, has good fruit and flower production because it is located in a high area with a cold climate. Sumbersekar Village has a variety of diverse agricultural products, including vegetables and fruits. One of the leading products is honey Siamese oranges. Orange production in Indonesia in 2022 is 2,717,447 tons, and as much as 1,194,489 tons, or 43.95%, is produced by East Java (BPS, 2023). The large number of plantation products is due to most of Sumbersekar's residents being farmers (Hidayah & Komariah, 2019). An obstacle that orange farmers often face is the selling price of honey Siamese oranges often falls during the harvest, so it often harms farmers. The selling price of oranges was influenced by the distribution channels carried out by farmers, and there were few harvests at that time (Ashari, 2018). When selling prices fall, many citrus fruits are left on the tree and not processed because of the unknown technology of orange processing. Previously, processing has been done but produces processed products with a bitter taste. One of the efforts to deal with excess unsold crops is to carry out post-harvest processing. Processed Siamese honey is an alternative to processed honey because the process is easy. However, the weakness of processed oranges carried out in household-scale industries is that there is still a bitter taste, so consumers do not like it. Therefore, citrus processing methods to avoid bitter taste need to be introduced so that their products have good competitiveness in the market. The solution provided by the team was the provision of training activities on how to produce good processed citrus products and also an introduction to good packaging technology. Thus, farmers in Sumbersekar Village can improve the quality of their processed Siamese honey products and compete better in local and regional markets. This will help increase farmers' incomes and reduce losses when the selling price of oranges falls during the harvest.

LITERATURE REVIEW

Various types of oranges are often found by people in Indonesia such as sweet oranges (*Citrus sinesis L.*), tangerines (*Citrus reticulata*), Siamese oranges (*Citrus nobilis*), large oranges / pamelo (*Citrus maxima Merr, Citrus grandis Osbeck*), lemons (*Citrus limon Linn*), limes (*Citrus aurantifolia Swingle*), citrons (C*itrus medica Limnaeus*), grapefruit (Citrus paradise Mactdijen), and hybrid oranges. Siamese oranges have been used as a typical fruit crop in the area, so citrus-picking tours have also been developed. Siamese orange or identified as *Citrus nobilis,* is one of the varieties of oranges that are widely circulated in Indonesian society. It has a round fruit shape with a round fruit tip weighing around 99.8 - 112.2 grams and a 7.2 - 10.3 cm diameter, with shiny yellowish-green fruit skin (Tobing et al., 2013). East Java is a fruit production area. Based on data from the Ministry of Agriculture, in 2019, Siamese orange production reached 985,455 tons from national production of 2,444,518 tons, or around 40.31%. Dau area, especially Sumbersekar village, is the center of Siamese orange production. Citrus fields are easily found in the village (**Figure 1**).

doi: https://doi.org/10.62885/abdisci.v1i2.130

Figure 1. Expanse of orange groves in Sumbersekar Village, Dau District, Malang Regency (Personal Documentation)

As the center of Siamese oranges in Malang Regency, there is often an excess of products during the harvest. The abundant volume of harvested fruit compared to the level of demand that does not increase often causes the selling price to fall, which is often detrimental to farmers. Fluctuations in the selling value of Siamese oranges often overwhelm farmers in handling it, so when the selling price is too low, Often, when the harvest arrives, farmers choose not to harvest and let the fruit remain on the tree because the production value issued is not proportional to the purchase price offered. This, of course, adds to the losses of farmers.

Local governments have tried to cooperate with the food industry; however, excess production often still exists, especially in Siamese oranges, which are of poor quality and not under the provisions of government partners. The community often discards excess crops not sold to the market because they do not know how to process them to become products. This is detrimental to farmers because of the loss of income. People do not know much about processing Siamese oranges and market opportunities.

One of the efforts that can be done is the empowerment of farmers or farming families by processing products so that products can be increased in selling value or processed into food products. The shelf life will also be longer, and the raw materials used can come from subgrade quality. One of the simplest and easiest orange preparations is made of orange juice (Putra & Ismail, 2016), puree, jam (Weriantoni & Mahsyuri, 2019), or candy (Maryan & Sari, 2021). Then, some of these products can be developed into various other processed products, such as utilizing citrus fruit peels in tea bags or extracting essential oils that can be used as essential oils that can be diversified into aroma therapy, candles, and organic soap products. In orange processing, the obstacle faced is that there is still a bitter taste because of the processed skin or seeds. To overcome this bitter taste, an orange press must be introduced. In addition, orange storage that is too long can affect the nutritional quality of Siamese citrus fruits. Within three days of picking, there is a decrease in weight or shrinkage, a decrease in vitamin C levels, and a decrease in solids value.

METHOD

This Community Service (PKM) activity was carried out in Sumbersekar Village, Dau District, Malang Regency. Activities start from January to September 2023. The implementationof PKM activities consists of: 1) Discussing Siamese orange processing and

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the obstacles faced, 2) Providing assistance on the use of tools so that product damage can be minimized, 3) Introduction of fruit presses to be described.

RESULTS AND DISCUSSION

Solutions Offered

The identification of partner problems, namely Sumbersekar Village, which was carried out by discussing with the community and other village stakeholders, obtained several problems and obstacles owned in Sumbersekar Village. With the problem of partners, there is no Siamese orange processing so that it is expected to produce superior products from Sumbersekar Village derived from Siamese orange processing. In addition, in the production process of Siamese orange juice, the taste is often bitter or included in the extracted juice. This can cause obstacles if massive production in the future is carried out because it can interfere with the sensory aspects of the product, and it can reduce consumer satisfaction. The initial solutions provided by the UB Team are as follows: 1) Provide counseling on the correct way of processing Siamese oranges; 2) Provide training on how to make processed oranges and how to minimize bitterness before packaging.

Coordination with the Head of Village and Head of Hamlet

In addition to the initial coordination efforts in May 2023 which focused on identifying problems and solutions, several additional steps taken in order to support the Community Service program in Sumbersekar Village. After deciding to prioritize the processing of Siamese orange juice and diversify processed Siamese citrus products as regional icons, the next step is to carry out a second coordination. The second coordination was carried out by involving the Head of the Village Family Welfare Development Drive (PKK) and the Head of the Working Group. At this stage, the focus is on conveying the results of the initial discussion to the parties who will be involved in this program. Determining the location of the program implementation became an important part of the second coordination, and the result was an agreement to implement the program in Semanding Hamlet.

Furthermore, the equipment needed for implementing activities is identified. This is a strategic step to ensure the program runs smoothly and efficiently. By knowing the equipment needs in detail, the implementation team can prepare everything needed to support training activities and the development of Siamese-processed citrus products. Thus, these structured coordination measures not only help formulate the objectives of the Community Service program but also ensure that all parties involved clearly understand their roles and responsibilities in running the program successfully.

Training Implementation

Pre-implementation of training was carried out at the TIP FTP UB Bioindustry Laboratory in the form of trials using three types of orange presses, including manual orange presses (vertical), manual orange presses (horizontal), and electric orange squeezers. The test will be carried out in stages two times on Thursday, July 20, 2023, and Tuesday, July 25, 2023. Testing of tools is carried out in order to ensure that the tools can work adequately before socialization to the community. The experiment results on Thursday, July 20, 2023, obtained the results of orange juice with an electric press. The quantity of squeezing was faster, and the results of orange juice obtained more in the same amount of time. But in the process of extracting oranges needs to be pressed to extract oranges more optimally.

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a) Electric press b) manual press (horizontal) c) manual press (vertical)

Figure 2. Trial Use of Orange Pressing Machine (Personal Documentation)

The second experiment, conducted on Tuesday, July 25, 2023, was conducted to determine whether the results of orange juice pressed using horizontal or vertical manual tools could be used properly. The difference between using a manual tool and using a horizontal manual press can be seen in the resulting orange peel pulp. In a horizontal manual press, the orange pulp looks more crushed, and there are several grains and epidermis. But the process that starts from slicing oranges to pressing them must be done manually one by one.

Siamese orange juice processing training will be held on Sunday, July 30, 2023, at 09.00 - 13.00 WIB. Training activities include an introduction to characteristics, nutritional value, packaging technology, processing technology, and product development that can be carried out, discussion sessions, and demonstrations of the citrus squeezing process. The training activity begins with the distribution of modules containing a summary of the material to be given during the training. The following is the cover of the module distributed in the Socialization and Introduction of Orange Processing Technology in Sumbersekar Village, Dau, Malang. presented in Figure 3.

Figure 3 Cover of Siamese Orange Juice Module Trainees (Personal documentation)

doi: https://doi.org/10.62885/abdisci.v1i2.130

The next activity was a presentation on how to process oranges correctly and adequately in order to avoid the bitter taste of juice. Then, there was also a presentation on the types and importance of packaging technology, especially in maintaining the shelf life of products, which can be longer.

Introduction of Fruit Pressing Equipment

In the coaching activity, a demonstration of the orange squeeze process was also given with three different tools to compare the results. The tools used include 1 unit of electric juicer and two units of manual orange press. This aims to identify the equipment that should be used to get the desired results.

Figure 4. Introduction and training activities (Personal documentation)

During orange juice processing training, trials of orange peel tea and orange juice products were also carried out. The results of orange juice obtained from the three experimental processes used different tools. A manual squeezer (vertical) still feels bitter because the skin is squeezed, and the results of the feeling are not optimal. The manual orange squeezer (horizontal) still feels bitter due to the skin being squeezed, and the results are more optimal than the manual squeezer (vertical). As for the orange squeezer, the electric one does not leave a bitter taste and has optimal feeling results. All participants can learn the principles of tools and the causes of bitter taste in oranges. This training received a positive response from all trainees because a tool can squeeze oranges without leaving a bitter taste. It still leaves a bitter taste in the orange juice. In this experiment, the orange results obtained from the horizontal manual press were relatively more bitter than those obtained from the vertical manual press. This is because the outer skin, epidermis, and seeds are also pressed by the brush on the press, causing a bitter taste derived from essential oils that are extracted and dissolved in the extracted juice. The following is documentation of pressing experiments using three different types of tools.

The activity after the training was handing over the three orange squeezers to Semanding Hamlet, symbolically represented by the PKK mobilization coordinator. The handover was carried out symbolically by Mr. Prof. Dr. Ir. Nur Hidayat MP, as the chief

doi: https://doi.org/10.62885/abdisci.v1i2.130

executive to the Chairman of the PKK Group Demanding Hamlet, Sumbersekar Village, Dau District, Malang Regency. The handover of the orange squeezer is expected to help the development of the economic sector in Semanding Hamlet in the future through training that has been carried out.

Figure 5. Orange squeezer handover activity (Personal Documentation)

CONCLUSION

The Sumbersekar Village PKK group has understood the cause of the bitter taste in orange juice and its benefits. PKK will form a group that will be fostered for the production of packaged jerus juice

Acknowledgement:
Thank you to BNBP Faculty of Technology Perrtanian for providing service fund assistance with contract number 1102/UN10. F10.06/TU/2023.

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