

# Revitalizing Orange Products: Implementation of Appropriate Technology for Higher Market Value

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## ABSTRACT

*Oranges have a short shelf life, requiring immediate sale or processing to maintain their market value. Gading Kulon Village in Malang Regency has fertile land, making it a potential area for citrus picking tourism. The phenomenon of abundant harvests every season causes tour operators to incur losses due to plummeting prices. Unsold oranges are given away for free, leading to minimal profits for the tour operators. The objective of this community service is to increase the selling price of products by processing oranges into candies. Efficient processing requires appropriate technology, facilitating tour operators in meeting consumer demands. The community service method involves training and product trials. The results of the community service demonstrate the enthusiasm of the women processing oranges in turning them into candies.*

**Keywords:** oranges, management, appropriate technology, market value

## 1. INTRODUCTION

Orange Picking Tourism in Gadingkulon, Malang Regency, is a tourist area with the potential for development. The fertile land in the area is utilized by the local community for planting various fruits, one of which is oranges. It is not surprising that the surrounding community relies on agricultural produce as a source of economic income. During the harvest season, a single location can yield up to 50 tons with selling prices ranging from Rp 6,500 to Rp 15,000 per kg. Gadingkulon is one of the partner villages of Universitas Merdeka Malang, and based on observations, it is known that many visitors come not only to experience the beauty of Malang but also to enjoy orange-picking tourism. Indeed, orange-picking tourism has its own appeal for tourists (**Simatupang et al., 2022**). Oranges are a fruit accepted by all layers of society, from children to adults. Therefore, it is not surprising that this interest becomes a potential source for tourism owners. The advancing era has transformed tourism from a luxury into a necessity (**Budi et al., 2020**).

Tourism activities not only have an impact on individuals but also on the government. Through the tourism sector, economic turnover can increase, providing positive effects such as opening job opportunities (**Mulia, 2021**). The orange-picking land in Gading Kulon is quite extensive and well-organized, making visitors eager to return. The sweetness of the oranges from each tree is also a "selling point" for the Gading Kulon area. Based on observations, it is known that

visitors come not only on weekends but also on weekdays. This condition is very advantageous if it can be developed even further. However, it is unfortunate that issues often arise during the peak harvest season. When oranges are abundant, tourism owners even struggle to sell them at high prices. The abundance that should be used as a time to accumulate profits turns out to be the opposite. However, oranges can be processed into a food product with the aim of increasing marketability. Oranges are a fruit that can be used to make a popular food product for various age groups, from children to adults, namely jelly candies. The complaint of tourism owners is not only the inability to process oranges but also the desire to have a product that can be sold not only to visitors but also during local events. Oranges undergo oxidation, leading to the degradation of vitamin C, making them not suitable for random processing (**Fauziati et al., 2016**). Processing oranges using appropriate technology aims to provide efficiency to meet demand (**Nursalim et al., 2021**). The goal of community service is to create jelly candy products that are not only resistant to oxidation but also easy to process and appealing to various groups.

### **1.2 Partner Problems**

The problems faced by our partners are as follows:

- a. Lack of knowledge about processing orange fruits.
- b. Lack of knowledge on how to properly process oranges to retain their nutritional value.
- c. Lack of tools to process orange fruits into finished products.

### **1.3. Intention and Objectives**

The goal of the Community Service Program conducted by the Community Service Team of Universitas Merdeka Malang under the auspices of LPPM is to provide a solution in the form of training on processing orange fruits into products. The Community Service Program with the Unmer Building Village scheme aims to empower tourism managers to develop tourism, thereby boosting the local economy. In addition to providing training, the community service activities also involve providing orange fruit processing tools. The purpose of providing these tools is to enhance home industries, reduce unemployment, and increase the selling price of orange fruits.

## **2. METHOD**

The Community Service Program was conducted on Saturday, October 21, and October 22, 2023. The activity was attended by 17 participants, including 10 business practitioners, 2 lecturers from Universitas Merdeka Malang, 1 lecturer from the Department of Culinary Arts at Universitas Negeri Malang, 2 students from Universitas Merdeka Malang, and 2 students from the Department of Culinary Arts at Universitas Negeri Malang. The method used by the Community Service Team from Universitas Merdeka Malang included training and evaluation, outlined as follows:

1. Training: This activity aimed to ensure that partners understand how to process oranges without losing nutrients and how to use machines.
  - a. First Implementation: Explaining the importance of processing oranges and emphasizing the proper methods to preserve the nutritional value of oranges, ensuring they are safe for consumption and storage over a specific period.
  - b. Second Implementation: Training on using orange processing machines to make them beneficial in the long term. This involves explaining machine usage and maintenance to achieve optimal results in each season.
2. Evaluation: This activity aimed to assess the partners' understanding of the material provided by the Community Service Team from Universitas Merdeka Malang. Evaluation of program implementation and sustainability in the field occurred after the training activities

were completed. Observations began with independent trials conducted by the citrus picking tour owners.

### 3. RESULT AND DISCUSSION

#### 3.1 Orange Processing Training

The community service activity began with the delivery of material on oranges as seen in figure 1 and 2. Oranges are fruits that undergo oxidation, potentially turning bitter if not processed correctly. Ms. Tetty, a lecturer in culinary arts at Universitas Negeri Malang, conducted a trial of products that are safe for consumption without compromising the nutritional content of oranges before providing training.



**Figure 1. Orange Processing Trial**

During the activity, the community service team, together with partners, explained the benefits of oranges and their processing methods. Oranges, with their fragrant aroma, are refreshing. Oranges, rich in vitamin C, contribute to a strong immune system (**Ahmad et al., 2023**). The team also emphasized that improper processing could lead to nutrient loss, undermining the benefits of oranges.



**Figure 2. Delivery of Material**

The explanation aimed not only to transfer knowledge but also to provide understanding for independent and correct application. Partners were enthusiastic about the explanations, considering the provided knowledge valuable. Oranges produced in Gading Kulon Village include siem, keprok, and baby oranges. Although the orange owner had been selling to various areas, challenges arose during the harvest season due to plummeting orange prices, causing financial losses. Therefore, knowledge about product processing was essential.

Oranges, being a perishable horticultural commodity, need diversification into processed products (**Fauziati et al., 2016**). Explanation of orange management started with the materials used. During the community service activity, it was explained that simple and readily available ingredients were used to make simple candy. Culinary arts students as community service team members explained that processing oranges requires precision and caution due to the vulnerability of vitamin C. The explanation began with the preparation of ingredients and simple tools easily accessible to housewives as seen in figure 3.



**Figure 3. Explanation of Product Processing Ingredients**

In the subsequent explanation, partners were invited to practice direct product processing. The implementation aimed to enable partners to witness firsthand the practices performed by the community service team. The practical session resulted in 20 jelly candies named "yummy candy." Jelly candy is a soft-textured sugar confection processed with gelatin to produce a chewy product (**Mayasari et al., 2020**). In processing "jelly" candy, it is necessary to lower the pH by adding acidic fruit juice, including lime juice (**Zia et al., 2019**). Therefore, lemon or lime was prepared in practice to add acidity and make the candy taste fresh. Figure 4 shows "Yummy Candy" Practice.



**Figure 4. "Yummy Candy" Practice**

During the practice, the women were enthusiastic, asking questions and discussing the proportions of each ingredient. Processing oranges into candy may seem easy, but it requires patience. One of the raw materials used is gelatin, which has a sticky texture, requiring careful processing to avoid foaming. Not only the fresh taste but also the color presentation is crucial in product processing. Therefore, mandarin orange peel was still needed to enhance the appearance.

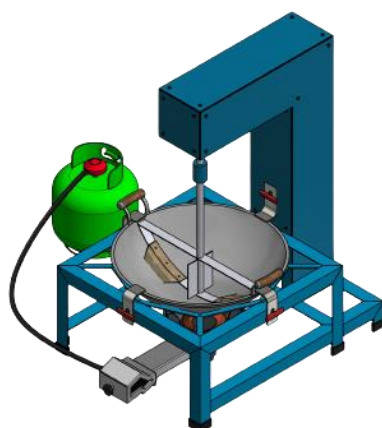


**Figure 5. Product Result**

The texture of "yummy candy" is similar to yuppy candy—chewy and fresh. The natural sweetness in the candy comes from the orange itself. Moreover, the addition of sugar to the outer layer serves not only to enhance sweetness but also as a natural food preservative. Sugar can be used as a food preservative due to its high solubility (**Merta, 2017**). Figure 5 shows product result.

### **3.2 Orange Processing Equipment**

Processing oranges into candy can indeed be done using simple household tools. However, this may not meet consumer needs, as using existing tools may only produce 20 small-sized pieces. Therefore, the community service team provides candy-making equipment as a form of product processing efficiency. Competitive advantages lie in technology, efficiency, productivity, input, and costs. Therefore, it is important to consider the use of appropriate technology for production improvement (**Prayuginingsih et al., 2014**).



**Figure 6. Candy Making Machine**

The principle of candy making involves stirring the required ingredients until they are fully cooked. Stirring is the operation that creates movement in the stirred material, aiming to ensure thorough mixing of the ingredients (**Sifa et al., 2020**). Stirring is a crucial process in candy making and needs to be adjusted according to the partners' needs to avoid product failure. After reaching maturity, the mixture is lifted, and the molding stage begins. The candy processing machine as seen in figure 6 is multifunctional, serving both candy and dodol (a traditional sweet confection).

The resulting machine can stir the mixture slowly, as the stirring process should not be performed quickly to prevent nutrient loss. The machine's speed can be adjusted according to the processor's needs. The diameter of the pan is tailored to the partners' needs, and the pan design is detachable. The stirrer is easy to remove, ensuring product cleanliness. The use of LPG is intended to reduce raw material costs. The use of candy processing machines is aimed at meeting consumer demand, especially during the harvest season to produce larger capacities. Product distribution is not limited to offline channels but also includes online platforms.

The partner has successfully used the candy stirring machine. This is evident from the results of candy production carried out independently by the partner. The independent candy-making activity serves as a form of feedback provided by the partner.



**Figure 7. Assisting in the Trial of the Equipment**

#### **4. CONCLUSIONS**

Fruits have a short shelf life, necessitating prompt sales to maintain high product value. Oranges undergo oxidation, making it safer to process them into candy. The product managers, particularly the women involved, showed enthusiasm for the community service activity and immediately applied the knowledge at home. Providing machines aims to address consumer satisfaction by meeting the demand, considering that production speed is a key factor in consumer satisfaction. The use of the machine is limited in capacity, and for the next community service program, it can be expanded with a larger capacity machine, coupled with a packaging process. The ongoing community service activities aim to address the growing consumer demand.

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