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Coconut (Cocos nucifera L.) Processing Training to Become Virgin Coconut Oil (VCO) to Improve the Economy and Community Health in Setiawaras Village, Cibalong District, Tasikmalaya Regency

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ABSTRACT

The potential of coconut in Setiawaras Village, Cibalong District, Tasikmalaya Regency is very abundant. In general, people only sell coconut directly to collectors whose selling price is relatively small. The knowledge of the people who are still simple causes the optimization of the potential of coconut not to be processed optimally. Optimizing the potential of coconut in Setiawaras Village can be an alternative way to encourage the creation of a strong economy in the community. This community service activity aims to provide training on the manufacture of virgin coconut oil (VCO). The first method used in community service is counseling and the second is training. Counseling serves as a means to introduce and explain to the public the potential of coconut that exists in the community and provide an understanding of processing coconut into virgin coconut oil (VCO) which has higher benefits from a health and economic perspective. Furthermore, training activities were carried out to provide skills to the community in processing coconut into virgin coconut oil (VCO). The method of making VCO oil is done by a fermentation system using probiotics Saccharomyces sp and Lactobacillus sp. simple so that people can understand and do it. The targets of this community service activity are farmer groups and the Family Welfare Empowerment Women (PKK) group.

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INTRODUCTION

Situation Analysis

Optimizing the potential of local natural resources is a strategy to grow and develop the economic level of local communities. Optimization of natural resources will open up employment and community empowerment in the economic aspect. This is especially the role of the government, but universities have a tri dharma program which among others will touch the community through community service based on the application of science and technology. In developing the local economic sector, the community needs to pay attention to various aspects such as the analysis of the potential of available resources, technology, and human resources, this is considered important to implement the right ideas in the development of local natural resources.

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The development of local areas begins with building strategic economic sectors that can revive and optimize various kinds of natural resource potential. The fact is that in some areas there are still potential resources that have not been managed optimally by the community. This makes village development slow and uneven.

Human resources in the village are generally still in the traditional scope. Mastery of skills that are still limited cause their ability to process natural resources in an innovative way that can increase the value of benefits is seen as not being able. Thus, the application of training strategies to build community skills is very important (Irayanti et al., 2022). Community empowerment will provide new skills to the community that will enable them to be more productive and innovative.

The community of Setiawaras Village, Cibalong District, Tasikmalaya Regency has abundant coconut potential. The product of processed coconut that is in great demand is virgin coconut oil (VCO). VCO oil is one of the most widely used oils for food. This is because VCO oil has advantages in terms of benefits compared to palm oil. Some of the benefits of VCO oil based on the results of expert studies are as a natural medicine to strengthen the body's immune system so that it is not susceptible to disease McCarty & DiNicolantonio, 2016; Nonaka et al., 2016).

Coconut is a renewable resource (Puscas et al., 2020). Every part of the coconut tree such as coconut shell, husk, fiber, and coconut water has been used for industrial and domestic purposes (Puscas et al., 2020; Roopan, 2016). Parts such as coconut roots can be used as herbal medicinal ingredients and handicrafts. Parts of the coconut shell can be used for crafts that have high aesthetic value, and parts of coconut leaves can be used to make broomsticks or for roofing houses. parts of the coconut fruit can be used to make VCO oil, and coconut milk and coconut water can be used to make nata de coco.

Coconut milk is an extract of coconut water from the solid endosperm (kernel) of coconuts (Karunasiri et al., 2020). Coconut milk has many benefits. Several studies have found that coconut milk can (coconut milk) prevent cavities, this is because coconut milk contains high levels of calcium (DebMandal & Mandal, 2011; Rahamat et al., 2019), including phenolic substances (Nadeeshani et al., 2015). Utilization of coconut milk in the community is often used as a cooking spice. In addition, coconut milk can be used to make virgin coconut oil (VCO) which will have a higher economic value.

Virgin coconut oil (VCO) is a clear liquid oil made from coconut fruit (Cocos nucifera L.) which is processed using complex techniques and many varieties to produce low water content and free fatty acids (Lalitha Ramaswamy, 2015; Villarino et al., 2007). Making VCO oil without excessive heating and chemicals will produce quality oil (Marina et al., 2009).

In Setiawaras Village, Cibalong District, Tasikmalaya Regency, it has enormous potential, but the community has not been able to process the coconut fruit optimally so that it has a cheap selling price. However, if this coconut is processed into a finished product, it will be able to improve the economy of the local community.

This community service activity provides benefits to the community in the aspect of processing coconuts into virgin coconut oil (VCO) so that it increases the selling value and aspects of the health benefits of the VCO oil.

Pure coconut oil has also been shown to have biological functions that are beneficial to the health of the body because it contains antibacterial compounds to maintain the body's immunity (Ayob et al., 2020; Malik et al., 2019; Thahir et al., 2022). Coconut oil products on the market so far still use the heating method that accelerates quality degradation such as the emergence of a rancid aroma. This coconut processing training uses a fermentation method that is easy, affordable, simple, effective and has the potential to produce quality VCO oil.

The implementers of this service activity technically consist of teaching staff from the Faculty of Agriculture, chaired by Mr. Yaya Sunarya, Ir., M.Sc and members consisting of Prof. Dr. H. Rudi Priyadi, Ir., MS, Dr. Hj. Rina Nuryati, Ir., MP. and Ade Hilman Juhaeni, SP., MP.

Literature review

Virgin coconut oil (VCO) is a clear liquid oil made from coconut fruit (Cocos nucifera L.) which is processed using complex techniques and many varieties to produce low water content and free fatty acids (Lalitha Ramaswamy, 2015; Villarino et al., 2007). In making VCO, fermentation is carried out using Saccharomyces cerevisiae bacteria which will produce oil that meets Asian Pacific Coconut Community (APCC) standards. (Masyithah, 2017).

VCO oil has antibacterial properties because it contains high-medium saturated fatty acids (Nguyen & Diep, 2022). Among the VCO contents include lauric acid, caprylic acid, and capric acid, with VCO content having strong antibacterial advantages against bacteria which can be efficacious against candida and fungal species (Dayrit, 2015; Khor et al., 2014; Nakatsuji et al., 2009; Ogbolu et al., 2007; Ripari et al., 2020).

In addition, VCO oil contains saturated fatty acids including Medium Chain Fatty Acids (MCFAs) and Medium Chain Triglycerides (MCTs) (Boateng et al., 2016; Mirzaei et al., 2018; Rahim et al., 2021). MCFA

is known as lauric acid which has anti-protozoa, antiviral, antibacterial, and anticancer properties (Deen et al., 2021; Intahphuak et al., 2010). The MCTs contained in VCO oil can enhance the body's immune system (McCarty & DiNicolantonio, 2016; Nonaka et al., 2016), such as accelerating healing from illness and helping prevent obesity, (Ayob et al., 2020; Júnior et al., 2021; Malik et al., 2019; Thahir et al., 2022), this is because VCO oil can suppress hunger in men with normal weight (Metin et al., 2022; Rodríguez-García et al., 2020). In addition, research has found that VCO oil, coconut milk, and coconut water have the benefit of preventing cavities because they contain high levels of calcium (DebMandal & Mandal, 2011; Lim, 2012; Rahamat et al., 2019). The content of MCT substances can also improve brain performance (Bisong et al., 2020; Krikorian et al., 2012; Mirzaei et al., 2018).

VCO oil is made from the separation of two layers of coconut milk which is first formed from grated coconut meat and water. The top layer was taken and followed by centrifugation at 1000 rpm for 60 minutes. The centrifugation results will produce three layers, then the oil layer is taken so that the oil pulp and water do not mix (Santesh & Prasad, 2012).

VCO oil production can be done by two methods, the first is the wet method and the dry method. Making VCO using the wet method is done by using grated fresh coconut meat and adding mineral water for the oil extraction process. Meanwhile, the dry method uses coconut which has become copra (Hasibuan et al., 2018; Rahmat et al., 2019).

Purpose and Benefits of Activities

a) Improving the community's economy through processing coconut into virgin coconut oil (VCO).
b) Maintaining public health by using natural and chemical-free VCO products.
c) Increased public interest in being able to utilize or process coconut into quality VCO oil through fermentation.
d) Increasing community skills in processing coconut into products that have high economic value.
e) The formation of a business group in the community that focuses on processing VCO oil.
f) The existence of quality standards/standards of virgin coconut oil.
g) The existence of promotional media both print and online that can promote VCO oil to a wide audience

METHOD

Activity Target

The target of this community service activity is farmer groups and the Family Welfare Empowerment (PKK) group of Setiawaras Village, Cibalong District, Tasikmalaya Regency.

Location of activity

This community service activity was carried out in Setiawaras Village, Cibalong District, Tasikmalaya Regency. Community service activities will be carried out starting on September 18, 2022, then monitoring and evaluation will be carried out in the following week, a combination of plans/reports on the implementation of research or PkM and the procedures used into one narrative part. The implementation that has been carried out must be demonstrated with references and with the appropriate implementation technique.

Figure 1. VCO oil manufacturing training
Source: Documentation

Method used

The implementation of this community service uses two methods:

a) Extension methods

The community service team provides counseling to the community regarding how to utilize the potential of coconut to be processed into VCO oil which has high economic value, that it can be consumed to strengthen the body's resistance to disease.

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b) Training methods

After the community was given theoretical counseling (Nawindah et al., 2022), then the community and the implementation team carried out the practice of making VCO oil using probiotic/fermentation techniques. Schematically the method of making virgin coconut oil is shown as follows:

The process of making VCO using the fermentation method:

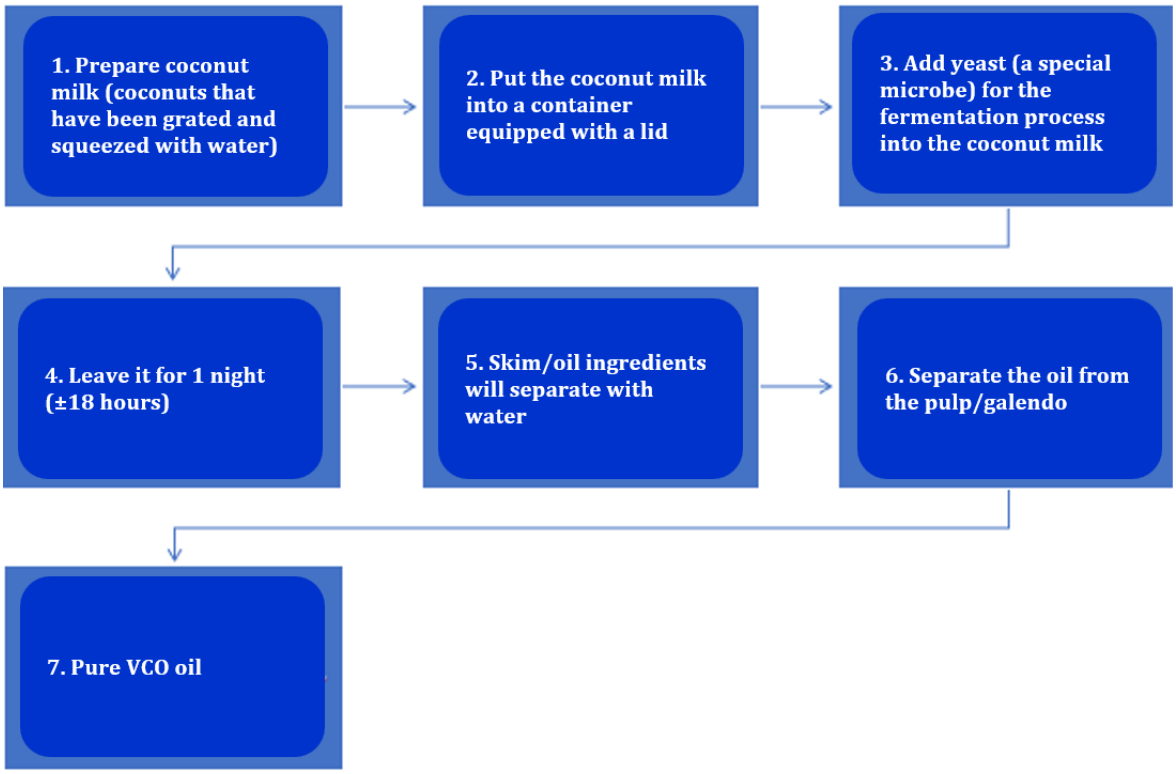

Figure 2. The process of making VCO oil

RESULTS AND DISCUSSION

The steps taken to make virgin coconut oil (VCO) are as follows:

1. Coconut sorting

The first stage is to sort out coconuts that are quite old. Coconuts that are quite old contain quite a lot of coconut milk so when the fermentation process takes place it will produce a relatively large amount of high-quality virgin coconut oil (VCO). Old coconuts have dark brown skin, while young coconuts are light brown.

Figure 3. Sorting Old Coconut
Source: Documentation

2. Coconut Wash

The second stage is to wash the coconut that has been removed from the shell. The washing process is carried out using clean water. This process is important so that the bacteria that can make coconut go stale quickly can be minimized.

Figure 4. Coconut Washing Process
Source: Documentation

3. Grated coconut

The third stage is grating the coconut which has been washed using clean water. Coconut grating is done using a grating machine so that the grating time is more efficient. It should be noted that when grated coconut is not left in the open air for too long, this can cause grated coconut to spoil quickly. One way is to put it in the fridge.

Figure 5. The process of grating coconut
Source: Documentation

4. Extortion and screening of coconuts

The fourth stage is to extort coconut milk. The grated coconut is then squeezed by the coconut milk using a filter. This process aims to remove the coconut milk that is still contained in the coconut fruit. The extortion process is done manually.

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Figure 6. Process of Squeezing Coconut Milk
Source: Documentation

5. Provision of fermented seeds

The fifth stage is the provision of bacterial seeds for the coconut milk fermentation process to become virgin coconut oil (VCO) using the probiotic bacteria Saccharomyces sp and Lactobacillus sp. (Santesh & Prasad, 2012).

Figure 7. Process of Entering Probiotics
Source: Documentation

6. Stirring the coconut milk

The sixth stage is the process of mixing the coconut milk which has been mixed with the bacteria Saccharomyces sp and Lactobacillus sp. This aims to mix the bacteria and coconut milk so that the fermentation process can be optimal.

Figure 8. Coconut Milk Stirring Process
Source: Documentation

7. Coconut fermentation process

The seventh stage is the fermentation of coconut milk. The coconut milk that has been stirred is then put into an airtight pipe. In this pipe, the fermentation process between bacteria and coconut milk occurs. The fermentation process was carried out for one night (18 hours), then VCO oil was formed.

Figure 9. Coconut Milk Fermentation Process
Source: Documentation

8. Separation and extraction of pure oil

The eighth stage is the separation between water and VCO oil. In this process, it will appear that the VCO oil is at the top rather than the water. by using a pipe, the VCO oil is channeled to be accommodated so that it does not mix with water.

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Figure 10. Process of Separating VCO and Galendo Oil
Source: Documentation

9. VCO Oil

In the final stage, virgin coconut oil (VCO) is ready to be packaged.

Figure 11. Pure VCO Oil
Source: Documentation

CONCLUSION

The community empowerment program with a program focus on training in the manufacture of virgin coconut oil (VCO) using the fermentation method will be able to provide skills to the people of Setiawaras Village, Cibalong District, Tasikmalaya Regency to take advantage of the abundant potential of coconut. With the skills of the community to process coconut into VCO, it will increase their productivity, to improve the community's economy. In addition, the benefits of VCO oil can be used by the community to maintain their health. In addition, this community service program has succeeded in forming a business group that focuses on processing coconut into VCO oil.

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