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Training in Integrated Coconut Product Processing and Marketing with the Implementation of Zero Waste in Banjar Lantangidung, Sukawati, Gianyar, Bali

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A B S T R A C T

Processing and marketing of integrated coconut products with the implementation of zero waste will be carried out by PKK Br. Lantangidung, Batuan Sukawati, Gianyar Bali. The goal achieved is to provide appropriate technology for processing coconut, which has the potential to be found in Batuan Village, Sukawati Virgin Coconut Oil (VCO), Serundeng (saur), and by-products, namely activated charcoal for health and consumption. The methods that will be used in implementing this training are interviews, face-to-face, counseling, and direct practice. The output target to be achieved is that training participants can independently make processed products and understand entrepreneurial knowledge and marketing management so that they can become economically independent

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INTRODUCTION

The potential of VCO as an antioxidant (Leliqia et al., 2020) and anti-inflammatory (Kardinasari & Devriany, 2020) and able to lower cholesterol. Several methods for making VCO have been discovered, such as dry and wet methods (Ghani et al., 2018). One of the resulting methods is to make VCO without heating or additional chemicals so that the quality of the VCO produced is the best. Heating and adding chemicals can change the structure and composition of the fatty acids contained in the VCO produced (Masyithah, 2017). Therefore, a method is sought that is safe, cheap, easy to manufacture, and can be applied on a household scale (Ilmiah et al., 2022). Serundeng is a typical Indonesian food made from grated coconut and added with several complementary spices (Dewi et al., 2023). The way to make serundeng is to fry it until golden brown with herbs that are ground first, such as shallots, garlic, chilies, coriander, turmeric, sugar, bay leaves, lime leaves, and galangal. In Bali, serundeng is better known as "saur." Serundeng or saur can be used as a mixture of side dishes in food (Sudiarta et al., 2023). Balinese people in particular use serundeng/saur as a complement to religious ceremonies. Not many Balinese people in particular make serundeng/saur directly as additional side dishes or as a means of upakara. People usually buy it in packaged form at the market or nearby stalls (Pande et al., 2021).

Coconut pulp and coconut water are part of the coconut fruit that can be used directly as food in daily life, while the coconut shell is usually thrown away and is of little use. Industrialization of activated carbon is starting to develop using steam and chemicals (Yanti et al., 2023). The process of making active carbon at that time also made powdered activated carbon. Steam activation of activated carbon has been applied to coconut shell charcoal so that the final product of activated carbon is granular (Ramadhani et al., 2020). Charcoal has better properties than firewood, so it is called a source of biomass energy, so charcoal briquettes are a renewable alternative fuel. The economic value of coconut shells can be increased by making them into charcoal, which is then activated into active carbon (Palungkun, 2017). Activated carbon is charcoal that has been solidified through an activation process, so it has better absorption properties. The process of making activated carbon through a pyrolysis process followed by an activation process can enlarge the pores in the charcoal, thereby increasing its absorption capacity (Yuniarti et al., 2013).

Considering the market potential and need for processed coconut products, namely VCO, Serundeng, or saur, and by-products, namely activated charcoal, efforts are needed to master the processing technology so that it can become a new business and increase people's income through various activities. Besides that, Br. Lantangidung is also now known as a tourist area, so it has the opportunity to become a market for food products. This situation provides an opportunity for the community to process their agricultural products, namely VCO, Serundeng, and by-products, namely activated charcoal, which can be marketed as souvenirs typical of Batuan Village (Ni Luh Putu Putri, 2023). The target audience we have determined this time is housewives, members of the PKK Merta Nadi Br. Lantangidung, from people who are not yet economically

productive but have a strong desire to become entrepreneurs. Besides, it can also be used as an additional livelihood, which plays a role in helping increase family income.

Post-harvest technology training activities and processing of processed coconut products into Virgin Coconut Oil (VCO), Serundeng, and by-products, namely activated charcoal, it is hoped that the community will be able to produce and market their processed products, thereby increasing family income and welfare (Ni Luh Putu Putri Setianingsih & A.A. Made Semariyani, 2022). With this data, to reduce the number of families who do not have permanent jobs, especially housewives, community service activities are proposed in the form of training on coconut-based processing in the form of virgin coconut oil (VCO), serundeng or saur, and a by-product, namely activated charcoal.

IMPLEMENTATION AND METHODS

Observation

An approach was taken by coordinating with the management and all members of the Merta Nadi Family Welfare Development Group (PKK) and determining and selecting meeting and training locations. The observation stage was carried out by obtaining information about the problems faced by partners, namely ignorance of coconut management. Apart from making coconut meat into cooking oil, it can be made into VCO products, serundeng (saur), and also activated charcoal (Nustini & Allwar, 2019).

Interview

Discussions and questions and answers regarding problems faced by partners, as well as planning activities that show solution steps to problems faced by partners. Providing appropriate technology in processing coconut-based products in the form of virgin coconut oil (VCO), serundeng or saur, and by-products, namely activated charcoal. Provide knowledge regarding good processing methods, sanitation and hygiene of processing, product packaging and labeling, storage, and marketing. Providing knowledge of implementing the basic feasibility of GMP (good manufacturing practice) and SSOP (sanitary standard operating procedures) to produce quality traditional snacks. Improve skills in making quality food preparations. Providing equipment and business capital assistance so that the types of food processing become more diverse.

Counseling

Partners will first be given material that has been prepared by the team in the form of a module containing coconut-based processing techniques in the form of Virgin Coconut Oil (VCO), Serundeng or saur, and by-products, namely activated charcoal, in an efficient way to increase Virgin Coconut Oil (VCO), Serundeng or saur, and the by-product, namely activated charcoal, which is produced in terms of quality and quantity, are provided with counseling and modules regarding supporting materials, namely about sanitation and hygiene, processing, packaging and labeling, marketing, entrepreneurship, and business management. For the training to be carried out, donations of equipment for

production were handed over to partners (Ni Luh Putu Putri Setianingsih, Gregoria S. Suhartati Djarkasi, et al., 2023).

Training and Practice Together

Product manufacturing, packaging and labeling of the products produced :

a. Making VCO

Process of making simple VCO without heating is explained by (Khasbullah et al., 2021) as follows: (a) grate coconut meat and add warm water in a ratio (1:1) so that more coconut milk is squeezed out; (b) put it in a container that has been given a hole in the bottom and leave it for 1-2 hours until 2 layers of kanil are formed on the top and water on the bottom (Nasution et al., 2022); (c) open the bottom hole of the container so that the water is wasted and then store the container containing the canal in a place that is not exposed to direct sunlight at room temperature; (d) after 1-2 days 3 layers will form, namely virgin coconut oil/VCO (top), remaining coconut milk (middle) and water (bottom); (e) harvest the VCO by scooping the oil at the top and then pouring it into a container that has been lined with tissue, cotton and filter paper to separate the oil from the coconut milk that is included (Kasih Haryo Basuki, Silvia Septhiani, 2009). This very simple technique will be mastered by ordinary people, especially in Br. Lantangidung, so that the transfer of knowledge and skills from academics to the community will run smoothly. The target partners in this VCO training activity are PKK members Merta Nadi Br. Lantangidung (Ni Luh Putu Putri Setianingsih, I Wayan Sudiarta, et al., 2023).

b. Making Serundeng/Saur

The process of making serundeng in Bali, better known as saur, can be used as a side dish to accompany rice, and Balinese people usually also use saur or serundeng as a complement to religious ceremonies. Not all people in Bali make saur or serundeng directly. More people buy saur or serundeng stalls in packaged form (Dewi et al., 2023).

Saur, or serundeng, is a preparation of coconut meat that has been grate, then seasoned with local spices, and cooked until dry. Saur or serundeng is always used every day as a complement to religious ceremonies and can also be used as a side dish. Because it is always used in everyday life, PKK women want to know how to make delicious and long-lasting saur or serundeng so they can make it themselves and can also use it as a selling idea. During the demonstration, the PKK women were very enthusiastic about watching the manufacturing process. The resource person, who is also a lecturer from the Food Technology and Agricultural Products Study Program, Faculty of Agriculture, Warmadewa University, also explained well the ingredients used and their benefits in making saur or serundeng (Dewi et al., 2023).

c. Making activated charcoal

Making activated charcoal is carried out after making virgin coconut oil (VCO) because the raw material for making activated charcoal uses coconut shells whose flesh has been separated from the coconut shell from the coconut flesh. The coconut shell is then put into a burning container, which is circumvented by using an iron barrel that has previously been designed to be used in burning coconut shells (shells) to become activated charcoal. The stage of heating the coconut shell is by burning the coconut shell to remove the water content in the coconut shell (Wattimena et al., 2023). After the burning process, the charred coconut shell raw material is left to cool completely so that the burned shell can be removed from the burning container and the charcoal that has undergone a complete and imperfect combustion process is sorted. Partners who were given training experienced an increase in knowledge after training in making activated charcoal (Ramadhani et al., 2020).

Monitoring and Evaluation

The final evaluation will be carried out on the PKM material provided to partners from the process of making processed Moringa leaf products with new technology packages, packaging, and labeling to online marketing distribution so that it can increase people's income (Ni Luh Putu Putri et al., 2022).

RESULTS AND DISCUSSION

The added value of coconut processing products can be increased by transferring science and technology to produce value-added products. The science and technology transfer and entrepreneurship approach means that participants are required to practice again so that participants can truly understand the stages of the processing process for each product (Yudhi Chandra Dwiaji, Nurato, 2017). So processed coconut will have a higher selling value and will increase the income of farmers as activity partners (Nustini & Allwar, 2019).

Table 1. Results of Activities (Output)

No.	Type of activity	Outcomes achieved (Output)
1	Counseling in introducing Virgin Coconut Oil (VCO), serundeng (saur) and activated charcoal products	100% Partners of the Family Welfare Empowerment Group (PKK) Merta Nadi, Banjar Lantangidung, Batuan, and Sukawati can use tools for the process of making virgin coconut oil (VCO), serundeng (saur), and activated charcoal to produce products with economic value
2	Education on how to use coconuts to make virgin coconut oil (VCO), serundeng (saur), and activated charcoal products	100% Partners of the Family Welfare Empowerment Group (PKK) Merta Nadi, Banjar Lantangidung, Batuan, and Sukawati understand the use of virgin coconut oil (VCO), serundeng (saur), and activated charcoal

3	Training to improve skills in utilizing coconuts in quality and hygienic Virgin Coconut Oil (VCO), serundeng (saur), and activated charcoal products	100% Partners of the Family Welfare Empowerment Group (PKK) Merta Nadi, Banjar Lantangidung, Batuan, and Sukawati are skilled in utilizing coconuts into high-quality and hygienic Virgin Coconut Oil (VCO), serundeng (saur), and activated charcoal products

This community service activity has been published in electronic mass media. The implementation of this activity involved 3 lecturers from the Food Technology and Agricultural Products Study Program, Faculty of Agriculture, and from the Management Study Program, Faculty of Economics and Business, Warmadewa University, namely Ni Luh Putu Putri Setianingsih, S.Si., M.Si., Ir. I Wayan Sudiarta, MP, and Ni Made Rustini, SE., MAgb. Implementation of activities involving the use of coconut fruit in Virgin Coconut Oil (VCO), serundeng (saur), and activated charcoal products can be seen in Figure 2.

Figure.1 Warmadewa University PKM Team Counseling to Group Partners

Figure.2 Handover of Equipment Donations from the Warmadewa University PKM Team to Group Partners

Figure.3 Group Photo of the Warmadewa University PKM Team (3 Lecturers and 3 Students) and 10 Group Partner representatives

Figure. 4 Training on the use of Coconut Fruit Into Virgin Coconut Oil (VCO), Serundeng (Saur) and Activated Charcoal Products

Figure.5 Training on the use of Coconut Fruit Into Virgin Coconut Oil (VCO), Serundeng (Saur) and Activated Charcoal Products

Figure. 6 Product Results Virgin Coconut Oil (VCO), Serundeng (Saur) and Activated Charcoal

Economic and Social Impact

The implementation of this activity had an impact on the PKK Merta Nadi Banjar Lantangidung, namely that a group consisting of 10 representatives of PKK members was able to independently process coconuts into virgin coconut oil (VCO), serundeng/saur from coconut dregs, and activated charcoal products that were ready to be marketed. With the existence of food diversification products, Virgin Coconut Oil (VCO), serundeng/saur from coconut dregs, and coconut-based activated charcoal have added value and can increase the income of PKK Merta Nadi Banjar Lantangidung.

Virgin Coconut Oil (VCO) products, serundeng/saur from coconut dregs, and activated charcoal, apart from being body care products, can also be consumed by all levels of society, from children to the elderly, and can improve people's nutrition because of the coconut content in them. The PKM implementation team also donated equipment for processing virgin coconut oil (VCO), serundeng/saur from coconut dregs, and activated charcoal to support partners in starting to produce virgin coconut oil (VCO), serundeng/saur from coconut dregs, and activated charcoal products and market them. thus becoming another source of income. Thus, this activity can certainly improve the welfare of the community, especially PKK Merta Nadi Banjar Lantangidung.

Partner Contribution to Implementation

Community Partnership Program activities regarding Virgin Coconut Oil (VCO) products, serundeng/saur from coconut dregs, and activated charcoal by PKK Merta Nadi Banjar Lantangidung, Gianyar Regency, Bali were carried out on Sunday, June 16, 2024, in the form of counseling or theoretical studies to provide an understanding of appropriate technology (TTG) material for processing coconut into Virgin Coconut Oil (VCO) products, serundeng/saur from coconut dregs, and activated charcoal, packaging techniques, and marketing techniques, which was attended by 10 representatives from PKK members. All partners (100%) actively take part in activities, and partners expect continuous assistance in processing coconut into Virgin Coconut Oil (VCO) products, serundeng/saur from coconut dregs, and activated charcoal into other innovative products.

Inhibiting Factors/Obstacles

In implementing PKM activities, the inhibiting factor is the difficulty of finding a schedule for implementing activities amidst busy community activities (partners) due to the large number of traditional activities in the village and several member representatives who work as silver craftsmen who cannot be guaranteed to get a holiday schedule so they can take part in training in making Virgin products. Coconut Oil (VCO), serundeng/saur from coconut dregs, and activated charcoal, so the implementation schedule is difficult to agree on.

Supporting Factors

PKK Merta Nadi Banjar Lantangidung is very enthusiastic about knowing how to process coconut technology into innovative products such as virgin coconut oil (VCO), serundeng/saur from coconut dregs, and activated charcoal. Participants independently want to practice making virgin coconut oil (VCO), serundeng/saur from coconut dregs, and coconut-based activated charcoal until they start marketing them.

Solutions and Follow-Up

Obstacles faced in implementing PKM can be overcome by communicating with group leaders and village officials. Extension activities and direct practice can take place smoothly.

CONCLUSIONS AND RECOMMENDATIONS

Community service activities have run smoothly. PKK Merta Nadi Banjar Lantangidung has been able to independently apply coconut processing technology and has produced virgin coconut oil (VCO), serundeng/saur products from coconut dregs, and activated charcoal. 100% of partners know good processing methods, processing, simple product packaging and labeling, broader marketing, and entrepreneurship. Strategic steps to realize the next plan are providing education regarding GMP (Good Manufacturing Practice), SSOP (Sanitation Standard Operating Procedures), how to make labels and proper packaging for processed coconut products into Virgin Coconut Oil (VCO), serundeng/saur from coconut dregs, and activated charcoal as preparation for applying for a permit at the Health Service (P-IRT).

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