

White Oyster Mushroom Product Innovation as a Nutritious Alternative to Animal-Based Meatballs

Farida Arinie Soelistianto¹, Martono Dwi Atmadja², Harrij Mukti Khristiana³, Aisah⁴

*^{1,2,3,4} Researcher, Malang State Polytechnic, Malang, East Java, Indonesia
Jl. Soekarno Hatta no.09 Malang, East Java,, Indonesia*

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ABSTRACT: White oyster mushrooms are a type of plant which contains nutrition needed by humans, such as carbohydrates, protein, unsaturated fatty acids, fibre, and vitamins. In the Covid-19 pandemic, the processing of nutritious and cost-effective food has greatly contributed to the immune system of the Indonesian people. However, the fulfillment of that need is difficult, due to the disruption of families' economic condition. In lieu of that, socializations and practices were given to housewives, in order to maintain daily food nutrition with the use of white oyster mushrooms which are processed into food, from ingredients that do not require much land to cultivate. The white oyster mushroom meatball is a high-quality, healthy, and innovative food for the family. The SNI Standard Number 01-2346-2006 states the quality standard of meatballs from a process of protein denaturation and enzymatic reaction from its mixing ingredients. Training for how to process meatballs from mushrooms was done through methods of socialization, practice, and observation by participants. The expected result before and after the training is the innovative meatballs processed from oyster mushrooms that are ready to be sold. The craftsmanship of the women of Ketawang Gede village in Malang became feedback from the partner to the socialization team as a success measure of the practice of making oyster mushroom meatballs. The conclusion of this method is the pre-test and post-test questionnaire, in which the average level of participant knowledge was 15% before the training, and 35% after training. Knowledge levels of 40% were also found, due to some women already owning businesses but have not yet been coached on marketing scales through social media.

KEYWORDS: White oyster mushrooms, oyster mushroom meatballs, housewives, carbohydrates, protein

I. INTRODUCTION

The prolonged Covid-19 condition in Indonesia has generally affected the peoples' income quality. The decrease of income has affected decline of health and nutrition fulfilment. Indonesia is an agricultural country, possessing plant diversity which can aid the people on the issue of family food and nutrition. One of the alternatives that contain a high level of protein, with a 27% protein value per 100 grams [1]. Protein is a body-regulator substance, as well as a biocatalyst enzyme in the chemical process. Oyster mushrooms are composed of carbohydrates, fats, thiamine, riboflavin, niacin, and calcium. The number of calories contained in oyster mushrooms is 100kJ/100g. Oyster mushrooms grow in nature by occupying soft woods, by making use of organic food remains. Oyster mushrooms do not have chlorophyll, and thus are not able to process food on its own, and therefore depend on absorbed organic materials for growth[2]. The cultivation of white oyster mushrooms require lignin as a nutrition source that are consumed by transforming carbohydrate macromolecules into sugar molecules, with the help of the lignin's enzyme in its metabolic process. Farming waste is a media than can be used as a mushroom cultivation media, which also helps decrease organic waste that is not beneficial to its throwing environment[3]. Oyster mushrooms are sold in markets with a price of Rp25.000 to Rp35.000/kg. Its relatively high price has made oyster mushrooms one of the alternatives to increase the economy of the people[4]. The pandemic condition caused by Covid-19 has in turn caused the housewives around the Ketawang Gede Malang village, who are generally housewives with side businesses of selling fast food, or selling in traditional markets, to worsen. To alleviate the issue of family health, producing food with

relatively low prices and also using oyster mushrooms, which can be cultivated in homes, have resulted in the creation of oyster mushroom-based healthy food[5]. This training is also an observational research on the effects acquired by the object, as the increase of education level on food processing and the increase of household-scale income for women in the Ketawang Gede Malang area.

The processing of oyster mushrooms results in a product that can be easily made, using existing equipment that the average housewife already owns. The processing of oyster mushrooms into meatballs is still rarely found, and therefore this training is expected to be able to aid the housewives in the Ketawang Gede Malang area as a healthy food alternative. The empowerment of women is one of the forms of education which can increase the skills of housewives for the condition of their social independence. However, many things have caused the lack of knowledge or limitation of skills in the development of their individual businesses, which becomes an obstacle for them. This training for making meatballs from white oyster mushrooms can open business opportunities for housewives who generally spend most of their time at home. Meatballs are a well-liked food, due to its chewy texture and delicious taste. According to the SNI No. 021-3818-1995 standard, the filling of meatball ingredients is a maximum of 50% from the total of ingredients. Tapioca flour is the filling ingredient to harden the meatball [6]. Due to this, oyster mushrooms are an alternative filling ingredient, although tapioca flour is still used as another mixing and adhesive ingredient. The taste of oyster mushroom meatballs is comparable to that of animal-based meatballs, such as chicken, fish, or cow meat[7]. Based on the background regarding family nutritional needs in the Covid-19 pandemic period, and also as a business product for women empowerment, this research is conducted as a form

of consumer analysis on the alternative ingredient in meatball processing. The method used in this research is based on training results and surveys, as a parameter of satisfaction in aiding the empowerment of women, especially housewives, in increasing levels of family nutrition and also household-scale individual businesses.

II. METHODOLOGY

The training in processing the oyster mushrooms uses the same technique as processing regular meatballs made of meat. However, attention must be paid in the process when the oyster mushroom is mixed with other ingredients, as a dough[8]. The processes that must be paid attention to is the soaking of mushrooms with water as the beginning step of cleaning from the probability of animals or dirt sticking on the mushrooms, the process of rinsing the mushroom, since water content must be minimized, as well as the mincing which is done as it is for meatballs made of meat. This training began with:

- a. Socialization and counselling, which is done starting from the process of choosing the tools and ingredients to be used, the method of processing and creating oyster mushroom meatballs, nutritional theories on oyster mushroom meatballs compared to other ingredients aside from meat as an alternative meatball ingredient for the health of children and adults, and the feasibility of the meatballs to be marketed as additional income to improve family economies[9].
- b. Selection of ingredients, such as fresh white oyster mushrooms, chicken or fish meat, corn starch, egg whites, salt, pepper, cooking oil, garlic, leek, and flavour enhancers. The tools used include knives, spatulas, food cutting boards, spoons, plastic containers and bags for packaging, meat grinders, and blenders. The steps of processing is shown in the following diagram:

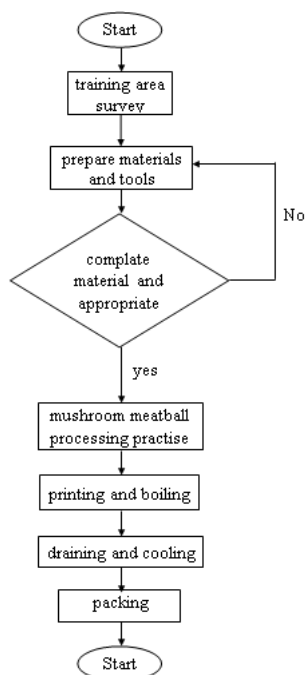


Figure 1. Flow of Oyster Mushroom Training

Based on the coordination training flow between the training participants or partners, socialization and guidance were done. The preparation of tools, ingredients, and schedule needed for the training are adjusted with the conditions of the housewives so as to not disrupt their daily activities. Guidance in the development of skills resulting from the training resulted in a promotional method as well as an interesting packaging. A bazaar was also made among the participants for the oyster mushroom meatballs, in order for them to introduce the result of oyster mushroom processing. The training method gave the basic recipe for oyster mushrooms as an alternative ingredient for meatballs, which include:

- 250 g fish meat
- 50 g sweet corn
- 200 g white oyster mushroom
- 4 tbsp. tapioca flour
- 3 cloves of garlic
- 2 liters of water

- 1 egg white
- 1 tsp. of salt
- ½ tsp. of baking powder
- leek and celery
- ½ tsp. of pepper powder
- enough salt
- flavor enhancer

After the demonstration of how to make oyster mushroom meatballs was done, the participants were given ingredients to practice with, in order to be able to make the mushroom meatballs independently. Aside from this, product hygiene and sanitation during the production process was also taught. After the processing of the mushroom meatballs is done, the participants were also taught to analyse the business of meatball products, so that it could be sold to help with their family's economy[10]. The last step is evaluation, to determine the absorption level from the partners on the program's success, through grading by means of interviews and questionnaires.

III. RESULT AND DISCUSSION



Figure 2. Ingredients for Oyster Mushroom Meatballs

Figure 3. Oyster Mushroom Meatballs

Based on the result of services by way of lectures and practice in making meatballs for the housewives in the Ketawang Gede Malang area this activity was executed well despite the limited number of participants and time. The housewives responded well, in accordance to the target and benefits from the execution of this training, to make a healthy, variative, and nutritious food alternative for the family. It also provides an opportunity to increase family income, using existing ingredients at home. The activity, which went on for two days, has sufficiently increased knowledge which can be well-practiced by the housewives. However, the housewives may still do consultations for the continuity of this activity, especially regarding product marketing and the marketing model which are adjusted to this pandemic condition. The order of practice done to make oyster mushroom meatballs begin with the ingredients shown in Figure 2, and results in the product shown in Figure 3.

From the determined and weighed ingredients according to need, the process to make the meatballs begins. The first step is to mix the dough, by grinding the mushroom stem using a blender, and squeezing out the water with a gauze or cotton cloth. This is done to result in mushrooms with low water content. Then, egg whites, corn starch, pepper, and salt is added. Afterwards, the mushroom meatball dough is mixed, and grinded fish meat is added, according to preference. Next, the dough is shaped into balls according to preference, and the soup is made of fish stock water that has been strained, and the ground spices

which are garlic, pepper, salt, sugar, flavor enhancer, and lime leaf are added. The meatballs that are already shaped are inserted into the boiling soup, and left until the meatballs float to the surface. The meatballs are ready to be enjoyed, or stored in a refrigerator. Figure 2 shows the finished outcome of the meatballs, ready for packing and marketing.

The innovation from this creative idea results in benefits from the perspective of knowledge, and also family economy. The selling value of these oyster mushroom meatballs can be increased by adding flavours such as cheese, barbeque, and other flavours. Nutrition experts have given their assessment regarding the taste, appearance, cleanliness, and packaging. These oyster mushroom meatballs were declared to be safe and healthy to consume, since it is made by well-chosen ingredients which are cleaned, and without preservatives, so that children can enjoy it as a nutritional food variation. From an economic standpoint, the price of mushrooms per kilogram is less than cow meat or chicken meat. In this pandemic condition, oyster mushroom meatball businesses are worthy to be marketed since its taste and appearance is comparable to meatballs made of cow meat. Based on an economic perspective, the price of mushrooms per kilogram is lower than that of cow meat and chicken meat. Through surveys and questionnaire results from the partners, the level of interest and skill absorption, according to the participants' satisfaction graph is shown in Figure 4 below.

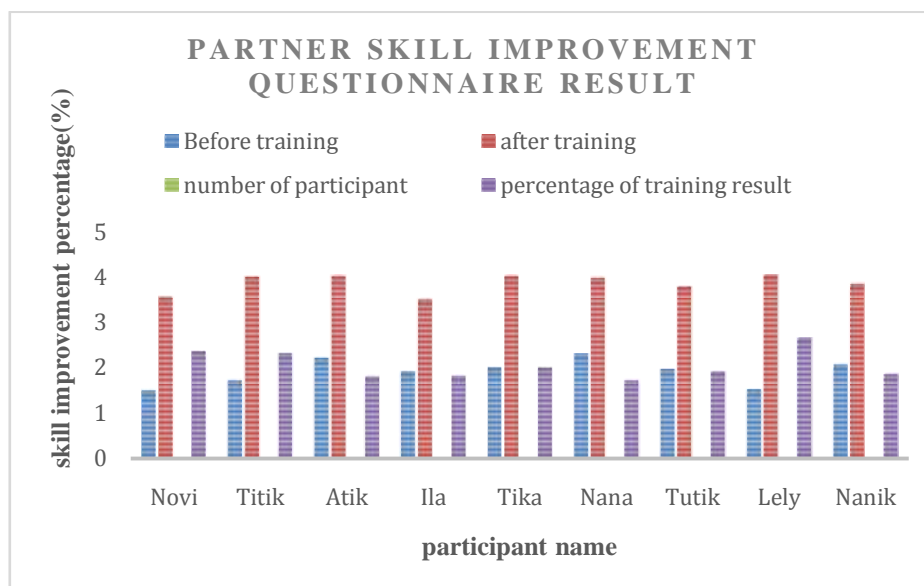


Figure 4. Participant Satisfaction Questionnaire Result

The questionnaire result is based on the pre-test and post-test administered to the participants, in order to measure the participants' knowledge level before and after the execution of the training. The participants are able to measure their skills based on questions on observation and practice of the oyster mushroom meatball production process. Afterwards, a discussion about marketing and meatball packaging for marketing was held. Process environment health, hygiene, as well as tool and ingredient sanitation were also taught. The participants were very enthusiastic, since the start of the presentation in which a video on the oyster mushroom meatball production process was played on an LCS projector, until the hands-on individual practice. Based on the questionnaire result recapitulation, the knowledge level on oyster mushroom meatballs was approximately 20%, knowledge level on hygiene and sanitation was approximately 30%, and knowledge of nutrition and low-cost healthy good variations was approximately 40%. According to analysis, the probability to market based on taste, shape, and flavor estimation of the oyster mushroom meatballs is 45%. The execution team of this training for housewives in the Ketawang Gede Malang area hopes that the participants will be able to develop this business of selling oyster mushroom meatballs, online using social media. Aside from being a low-cost alternative to increase family nutrition for daily consumption, these oyster mushroom meatballs can be made into a targeted business opportunity.

IV. CONCLUSION

Based on the training activity for housewives in the Ketawang Gede Malang area in the form of lectures, discussions, and practice in producing oyster mushroom meatballs, this training took a high interest and progressed knowledge about low-cost yet nutritious food, which can be marketed and add to family income in this pandemic period. The interest on this activity before the training was 15% on averaged, and after the training the participants' knowledge level was 35% on average. Based on this result, nearly 40% of the participants experienced an increase of marketing knowledge, due to the fact that these housewives generally already owned businesses, yet have not been guided on marketing scales using social media. With the increase of basic marketing knowledge, this activity can increase family economies through additional family income.

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