



EXTENSION OF ORGANIC WASTE UTILIZATION FOR FISH FEED (CASE STUDY IN TANJUNGSARI, SUMEDANG DISTRICT, WEST JAVA PROVINCE)

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ABSTRACT

Tanjungsari is one of the districts in Sumedang which has the third-highest population density, so the impact on high food industries such as restaurants. This situation can have the impact of organic waste products provide high dining so it needs the utilization of organic waste as not to become a new problem. One of the efforts is to utilize organic restaurant waste as an alternative feed ingredient. This research aims to analyze the extension that is done to the community Tanjungsari, about the utilization of restaurant organic waste as fish feed has a function as information about these innovations. The method in this research is the descriptive-analytical approaches to the public with the participation of outreach activities, through pre-test and post-test. Based on the research that has been done obtained increased public interest to utilize organic waste as fish feed and the public understand that making the feed to utilize organic waste meal was able to have economic value and be able to help reduce the pollutant load of organic waste.

INTRODUCTION

Tanjungsari is one of the districts in Sumedang which have high population density and is in third position districts with the highest population density in Sumedang. The population in the area Tanjungsari in 2017 reached 80 878 inhabitants [1]. The high number of the population makes growing food service providers such as restaurants grow and will lead to the production of organic restaurant waste also increases. The high production of organic restaurant waste needs to be accompanied with proper management in order not to cause new problems, one of the efforts in managing organic waste by using it as a meal is fish feed ingredients.

Regulation of the Minister of Marine and Fisheries of the Republic of Indonesia No. 55 Year 2018 on Fish Feed explained that fish feed is a food single or mixed whether treated or not given to fish for survival, growth, recovery and breeding either natural feed or artificial feed [2]. Feed the fish is an important instrument in aquaculture activities. That is because about 70% of production costs spent on the cost of feed, so as to curb the high cost of production necessary to feed manufacturing independently by making use of materials available in nature but still qualify as an alternative feed ingredients. The conditions of a material can be used as an alternative feed ingredients, among others, the material is easily obtained, utilization does not compete with humans, nutritional value, have the availability of abundant and can be ingested by fish. One material that could potentially be used as an alternative feed material is organic restaurant waste [3]. Beside from the presence of abundant, restaurant waste also contains nutrients. Based on research from the Agency for Agricultural Research and Development obtained the nutritional content of organic waste meal includes protein content of 10.89%, 9.70% fat and 9.13% crude fiber [4]. However, one problem is that people still do not understand how the process of making fish feed by utilizing organic wastes restaurant as feed material. So we need an organic restaurant waste treatment solution is through extension activities.

Law No. 16 of 2006, has made it clear that education is a learning process for the main actors and businesses so that they are willing and able to help and organize themselves in accessing market information, technology and other resources, in an effort to improve productivity, business efficiency, income and welfare, as well as improving awareness on environment conservation. Outreach activities have the goal of educating the nation and promote the general welfare is done in a process of education [5]. Extension of the utilization of waste this restaurant has a function to raise public awareness of environmental sustainability.

Waste is a material that comes from the rest of the production was not required and have no value. Waste restaurants covering all goods that are not utilized during the cooking process and also the rest of the food was not exhausted. Waste restaurant has a fairly high nutrient content, Table 1 is the result of research on restaurant waste.

Table 1. Nutrient of Restaurant Organic Waste

Category	Organic Waste Meal					
	1	2	3	4		
Protein (%)	10.89	15.29	12.69	27.10	23.12	22.33
Crude Fiber (%)	9.13	7.73	6.42	3.04	3.88	4.59
Fat (%)	9.70	8.97	7.45	10.46	11.78	13.38

Information :

1. Agricultural Research and Development Agency (2000) [4]
2. Setiawan (2006) [6]
3. Soewarno (2007) [7]
4. Ruminant Nutrition Laboratory and Feed Chemistry, Faculty of Animal Husbandry, Padjadjaran University (2018)

Utilization of restaurant organic waste as feed meal had already used on the chicken farm, but be it be a new innovation for fisheries. So it is necessary to educate more people Tanjungsari village Tanjungsari especially the fish farmers on the use of municipal waste meal as the manufacture of fish feed, so that it can be adopted by the community. The function of a process of extension among others to facilitate the community in the learning process, working on people's access to resources, technology and other resources, increase leadership, managerial and entrepreneurial society, grow the community towards environmental sustainability [16].

Adoption of innovation is a process of change in knowledge, attitudes and skills in a person since then recognize innovations to decide to adopt such innovation [8]. In addition, the adoption of innovations in agriculture and fisheries include the dissemination of information on ideas or new ideas in an attempt to change a society that has occurred simultaneously with certain period [5]. In the process of innovation adoption there are stages, such as stage of consciousness (awareness), stage of interest (interest), stages of evaluation (evaluation), the stage of trying (trial) and stages of adoption (adoption) [9]. In the process of adopting innovations there are several important elements which include, 1) Innovations that are ideas or goods that are considered new, 2) Communication channels which are tools for conveying information, 3) Time which is important for recipients of innovation to determine choices and 4) The social system formed in the community [17]. Also, some factors influence the process of adoption of innovation, namely age, education, motivation, attitudes toward change, aspirations, psychological states and belief systems [18].

METHOD

The method used in this research that extension, where the material will be delivered later practiced. The results of this extension include a change in thinking, expansion of knowledge, skills and attitudes. The evaluation process is done by holding pre-test before extension and post test after the extension. Questionnaires filled in by all participants who numbered people from the community and students [5].

The process of making fish feed with raw starch organic waste meal is to collect waste from restaurants, terms of waste that can be used is a waste of more than one day so it does not decay which will destroy the nutritional content therein. After that, the waste were selected based on three categories of animal protein sources (meat and bone), vegetable protein (veggie) and carbohydrates (rice). Further materials that have been, then chopped using a knife. After the enumeration process, the waste further in-press to reduce the water content in the material. Furthermore, materials and kiln dried after the waste dry powdered.

After made organic waste meal, fish feed manufacturing process followed by calculating the needs of protein and other materials required in the manufacture of pellets to feed formulation process. This feed formulation process using the Pearson-square with crude protein levels in fish feed by 30%. Pearson-square method provides a simple and quick calculation to provide information about the mix some feed ingredients that contain different nutrients according to the nutritional needs of animals [14]. Once the process is completed feed formulations, feed manufacturing continued to prepare the feed material in accordance with the calculation of feed formulation and feed mixing all materials that have been provided earlier to become one.

RESULTS AND DISCUSSION

Based on the Law of the Republic of Indonesia No.45 of 2009 on Fisheries explained that fisheries are all activities related to the management and utilization of fish resources and the environment ranging from preproduction, production, processing to marketing conducted over a fishery business system [15]. Fisheries is a resource which is a state asset and should be used and should make a significant contribution to the welfare of the nation [10]. The fisheries sector in Indonesia have varied sources include fish (capture) and aquaculture (aquaculture), which contribution in the welfare state is still measured by the Gross Domestic Product donations, foreign exchange and employment [11]. Sumedang is one area that has great potential for economic growth, the environment, science and social, Sumedang Regency Regulation No. 2 Year 2012 on Spatial Planning and Regional Sumedang years 2011-2031 states that Sumedang conceived as Minapolitan [12]. So as to achieve these objectives need the participation of the whole society, including farmers in Tanjungsari.

Tanjungsari is one of the districts in Sumedang which has an area of 35.62 km² with a distance of 19 km to the capital city of Sumedang. Tanjungsari has the third highest population density after the District and Sub-district Jatinangor Cimanggung. The population in the area Tanjungsari in 2017 amounted to 80 878 inhabitants with the population growth rate in 2010 to 2017 amounted to 5.15% [1].

The high number of the population have an impact on the growth of the food industry such as restaurants as supporting the needs of society. The presence of restaurant, also affect of production organic waste, so that the necessary presence of organic waste management in order not to create new problems for the environment. One solution of these problems is to use organic waste as feed fish material.

Based on the results of extension that has been done, all of participants have an interest in the utilization of organic waste as feed fish. (Picture 1). Restaurant organic waste meal has great potential to be used as an alternative feed ingredient because it has high availability, do not compete with humans, nutritional value and can be ingested by fish. The test results of proximate who has done as much as 3x the average protein yield of 24.18%. This result has exceeded the recommended protein content as feed material, wherein a feed material must have a minimum protein content of 20% [3]. Restaurant organic waste meal with a large scale and in the long term will have an impact on the environment,

Pelleting process and formulations that do have the goal of keeping the organic waste meal mixed with other materials so that the content of fish feed better and can be digested easily by the fish. Things that need to be considered in making pellets of fish is the size of the pellets produced. The size to be one of the important things in the manufacture of pellets for the feed to be adapted to the purpose at certain stages in fish. The results of proximate conducted in fish feed with organic waste meal is the protein content of 30.58%, 6.92% crude fiber, fat 4.35%.

Organic waste meal is able to minimize the usage percentage of soy flour and fish meal. In addition, the organic waste meal is also able to reduce production costs, because the farmers have been able to produce feed independently. Feed production with large scale can also be a business opportunity for the feed can be traded so that it becomes an additional income for the community. Another benefit is obtained by the use of organic waste meal as feed fish is to reduce pollutant load due to organic waste produced by restaurants reused into feed.

Stages of the adoption of innovation requires time and a long process with several stages to go through the stages [9]:

1. Phase Awareness, at this stage participants get information about innovations extension utilization of restaurants organic waste. The existence of the information obtained on the extension makes the participants have the awareness to take advantage of the organic waste meal into feed fish.
2. Phase Interests, this phase of extension participants became interested in the feed manufacturing process exemplified by an instructor. The collection of information is mostly done by the participants by asking questions during the feed manufacturing process.

3. Evaluation, this stage becomes the most important stages for counseling participants here take the decision whether the innovation which has been taught would be adopted or not. At this stage, the extension is said to be successful if the beneficiary is able to take decisions in the construction [13].
4. Trying, at this stage the participants who have chosen to adopt the innovation will try to apply and make feed by utilizing of restaurant organic waste meal.
5. Phase Adoption (Adoption), this step ensures participants adopted the extension of all activities so that innovation has economic value.

Outreach activities initiated by providing a pre-test for the participants and the end of the extension will be evaluated by providing post-test, the results of pre-test and post-test can be seen in Figure 1.

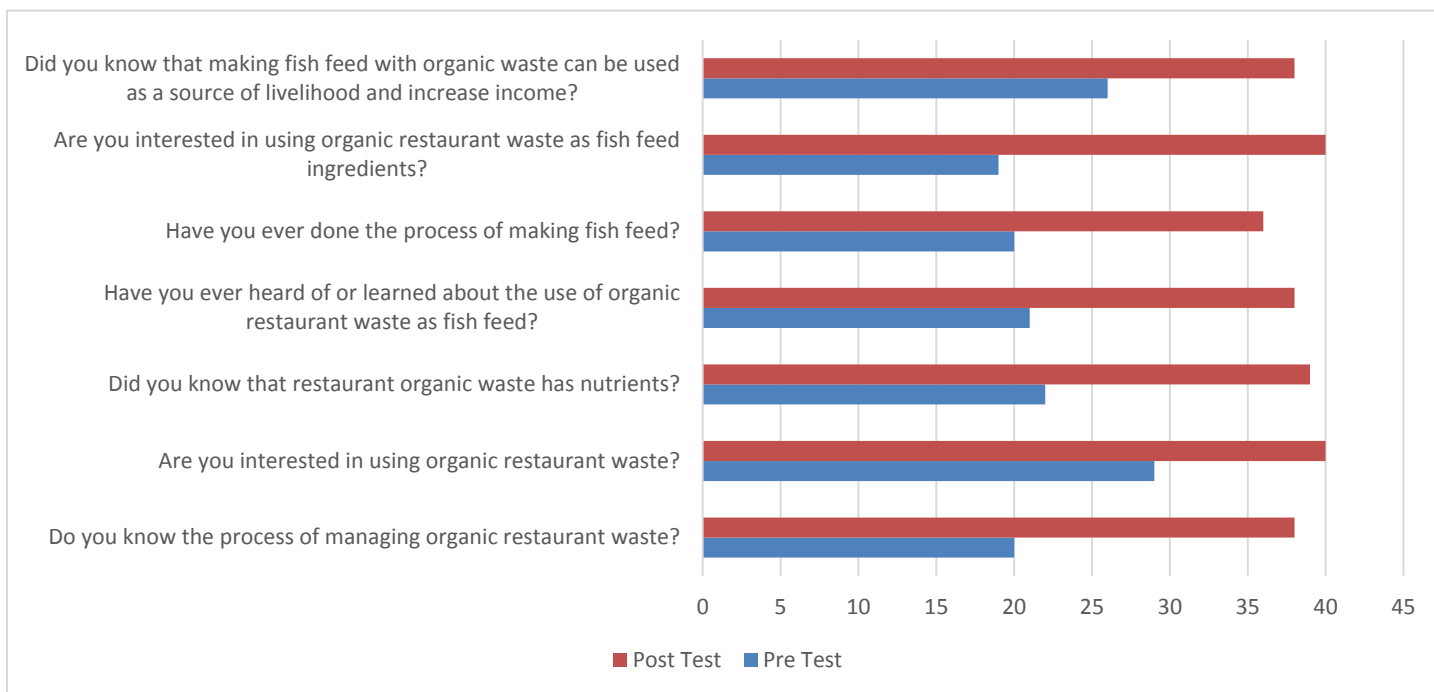


Figure 1. Results of Pre Test and Post Test Participants Extension

At the beginning of counseling participants who have an interest to take advantage of restaurant waste is by 73% while after counseling participants who have interest increased to 100%. Participants who took an interest in the utilization of organic waste as feed fish at the beginning there is a 48% extension, after extension to 100%. 50% of participants have learned the process of making fish feed at the beginning of the extension and increased to 90% at the end of the extension. The participants of extension who know or have heard of organic waste utilization as feed fish at the beginning of the extension are as much as 53% of people and grew to 95% of the participants at the end of the extension. Overall, at the end of extension all participants have an interest to utilize organic waste as feed fish.

Conclusion

Based on this research, can be concluded that activities have been carried out to provide information on the utilization of restaurant organic waste as an alternative feed ingredients and the information is entered into the stage of awareness and foster interest in the education of participants utilizing organic wastes restaurant as alternative feed ingredients.

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