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ASSISTANCE FOR THE COMMUNITY OF SEMPU HAMLET, NGADIROJO VILLAGE, MAGELANG REGENCY IN BIOCONVERSION OF ORGANIC WASTE INTO ALTERNATIVE FEED FOR MAGELANG DUCKS

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ABSTRACT

Livestock is one of the livelihoods that contribute to the economy of the Indonesian people, one of which is the Magelang Duck livestock group "Sumber Makmur". However, the problem of high feed prices in the market causes the current profits obtained by the farmer group to be inadequate. In addition, another problem that occurs in the Sempu hamlet environment is the absence of a waste processing site. Residents have to wait for a team of officers who clean the surrounding environment so that garbage often accumulates, which causes pollution to the environment. Therefore, the service team offers a solution by assisting in the cultivation of Black Soldier Fly (BSF) larvae through Organic Waste Bioconversion. The activity was carried out using a Community Development approach, with socialization, training, and practice on the bioconversion process of organic waste using Hermetia illucens larvae. The training and mentoring activities received positive responses from the activity participants. Massive training and mentoring efforts can be carried out to solve environmental and economic problems, especially for Magelang Duck breeders.

Keywords: Bioconversion, Magelang Duck, Black Soldier Fly Larvae, Organic Waste.

INTRODUCTION

Livestock is one of the livelihoods that contribute to the economy of the Indonesian people. In addition, this sector also absorbs labor, so it can be relied on in improving the economy. One of them is a duck farm in Sempu Hamlet, Ngadirojo Village, Secang District, Magelang Regency. Duck farming in Sempu Hamlet is one of the livelihoods of its residents. Ducks are potential poultry producing eggs and meat (Azizah, 2022) (Azizah, 2022). Magelang ducks are ducks that are quite potential as egg producers. This is supported by research results which show that Magelang ducks produce higher egg production than Tegal ducks (Sucipto et al., 2018). Therefore, the duck business is one of the businesses that provide greater household income than other businesses (Pangemanan et al., 2021). There are at least 13 duck farmers who are members of the “Sumber Makmur” livestock group which has been established since 1994. This livestock group is divided into hatching, rearing, and rearing ducks.

The number of hatchery units is 11 units, the enlargement unit is 2 units and 250 birds, and the rearing unit is 300. This considerable amount requires the availability of sufficient feed in the rearing and rearing unit so that the condition of the livestock is good and worthy of sale.

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The feed is given to ducks in the form of rice bran, aking, concentrate, and grain. Breeders must buy this feed every day to meet the needs of duck feed. Preparation of the ration formation is needed to meet the needs of animal feed (Rahayu et al., 2022).

However, the pandemic conditions caused livestock management to become less stable for several reasons. First, the price of feed in the market becomes high so the purchasing power of farmers decreases. Before the pandemic, the price of 1 kg of concentrate was worth the price of 3 eggs. However, currently, the price of 1 kg of concentrate is equivalent to the price of 5 eggs. Even though 1 kg of concentrate is only sufficient for a duck to feed for 4 days. Therefore, farmers do not only rely on concentrated feed. Breeders provide rice bran, aking, and unhulled rice to fulfill duck feed needs. In the 2000s, farmers provided additional feed for ducks by herding ducks in rice fields. However, at this time farmers cannot apply this method because there are many areas of rice fields that have been converted into residential areas. This condition causes the fulfillment of animal feed sources of protein for ducks to be less than optimal.

In addition to the problems faced by the farmer group, other problems occur in the Sempu hamlet environment, namely the absence of a waste processing site. This causes the production of waste from community activities to be disposed of by officers. Residents have to wait for a team of officers who clean the surrounding environment so that garbage accumulation often occurs which causes pollution to the environment. In the end, people prefer to throw their garbage on their land. This has led to community conflict because the landowners forbid the disposal of waste on their land. The people of Sempu Hamlet have not been able to process waste, both organic and inorganic waste to reduce environmental problems that arise in the village.

Based on the problems that exist in Sempu Hamlet, it is necessary to find a solution that can be given to solve it. Efforts to handle waste in processed animal feed can be one solution to the lack of animal feed (Sudrajat et al., 2018). One solution is to cultivate Black Soldier Fly (BSF) larvae through Bioconversion of Organic Waste. Bioconversion is a natural process that involves insect larvae absorbing nutrients from organic waste into insect larvae biomass (Fahmi, 2015). BSF larvae have a high protein content of between 45-50% and 24-30% fat so they have the potential as a substitute for animal feed (Rambet et al., 2015). Therefore, there is a need for assistance activities in processing household waste through waste bioconversion using BSF larvae. These BSF larvae can be used as feed for ducks to reduce the cost of buying feed by farmers. In addition, the cultivation of BSF larvae will reduce the pollution in Dusun Sempu as a result of the organic waste produced by the community.

IMPLEMENTATION METHOD

Location of activity

This activity was carried out in collaboration with the "Sumber Makmur" livestock group and the PKK group in Sempu Hamlet, Ngadirojo Village, Secang District, Magelang Regency, Central Java. The activity will be held in July 2022.

Approach to implementation of activities

The approach used to solve partner problems is the Community Development approach, which is an approach oriented to the development of livestock group empowerment by making the group the subject, object of development, and direct involvement in various service

activities that will be carried out.

Activity implementation method

The implementation method is socialization, training, and practice about the bioconversion process of organic waste using Hermetia illucens larvae. The stages of the activities carried out are:

1. Coordination of the service team
2. Site survey, identification of village problems and potentials in the development of organic waste bioconversion
3. Assessing the knowledge of partner groups regarding organic waste processing by filling out questionnaires
4. Socialization, training, and practice of the organic waste bioconversion process with Hermetia illucens Larvae to the construction of an organic waste bioconversion installation.
5. Assistance and Monitoring
   Mentoring activities include assistance in reviewing the results of organic waste processing and assistance in harvesting BSF larvae.

RESULTS AND DISCUSSION

This community partnership program (PKM) was implemented in the hamlet of Sempu, Ngadirojo Village, Secang District, Magelang Regency. PKM activities involve the Magelang Duck livestock group and the local hamlet PKK group. PKM activities will be carried out starting in July 2022 which begins with the coordination of the PKM team involving students to prepare a series of PKM activities. The documentation of the PKM team coordination activities is shown in Figure 1.

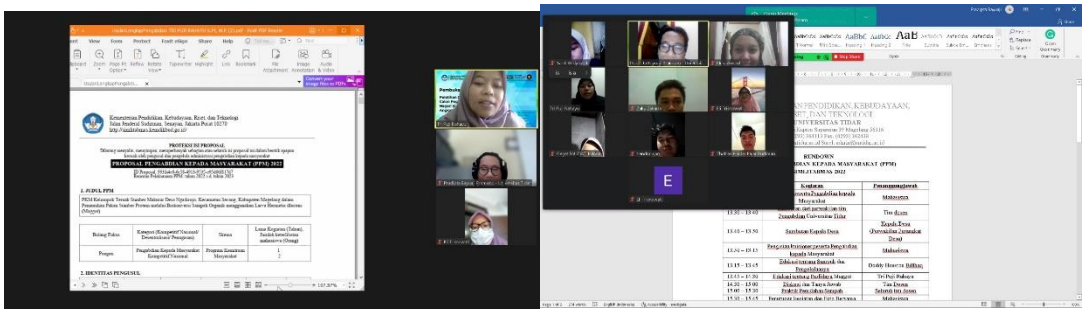

Figure 1. PKM team coordination activities

The PKM activity was carried out for the first time on July 15, 2022, with educational materials and the practice of sorting household waste. The activity began with education by the PKM team to 30 participants from the livestock group and the PKK group. Before the educational activity, an analysis of the participants' understanding of waste management was carried out. The results of the analysis are shown in Figure 2.

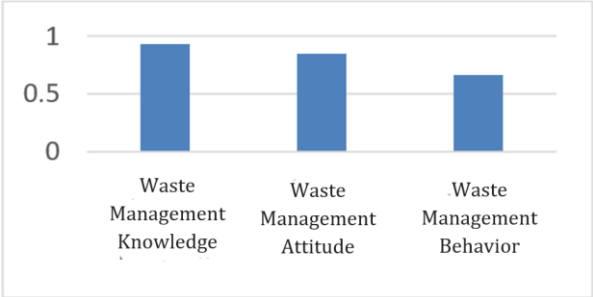

Figure 2. Participants' initial understanding of waste management

The initial knowledge of PKM participants about waste management is quite good, which is shown by more than 75% of participants who understand the types of waste. However, participants still lacked an understanding of the equipment for collecting waste. On the other hand, good knowledge about waste management is not supported by appropriate attitudes and behaviors. The results of the initial analysis show that the behavior of PKM participants regarding waste management is still not good. The results of the initial analysis of PKM participants become material for the PKM team to educate about waste management. The PKM team gave general education on waste management, then continued with organic waste management. This outreach activity was followed by a discussion on how to manage the waste produced by the community, which is possible to be done independently by the community. After the counseling activity was carried out, it continued with the practice of sorting waste so that the activity participants better understand how they sort the waste produced before it is managed. Activity documentation is shown in Figure 3.

Figure 3. Documentation of educational activities and waste management practices

The next PKM activity was with educational materials on waste management and BSF larvae cultivation. Before the educational activity took place, an analysis of the participants' understanding of BSF larvae was conducted. The result was that 89% of the participants who attended had never received any information about BSF larvae. Education was carried out by providing initial information about BSF larvae, waste management using BSF larvae, and the potential for managing BSF larvae. The participants of the activity were very enthusiastic after receiving information on waste management using BSF larvae.

The application of science and technology delivered by the activity team for the “Sumber Makmur” livestock group and the PKK Dusun Sempu group is producing maggot as an alternative feed for Magelang Ducks. The bioconversion process starts from cultivating BSF flies to laying eggs, then the eggs will be placed in fermented organic waste so that they are easy to hatch. Next, the resulting baby larvae are put in organic waste bins that have been sorted

and chopped to reduce waste and produce adult larvae (maggot). In the bioconversion process, organic waste will be converted into simple compounds, both protein and fat, through a fermentation process involving living organisms. the longer the fermentation of the hatching media, the higher the biomass of the hatched Hermetia illucens larvae (Rahayu et al., 2021). The decomposition process of organic waste under anaerobic conditions produces NH3 and CH4 which inhibits the decomposition process by Hermetia illucens larvae. The concept of organic waste bioconversion using Hermetia illucens larvae is shown in Figure 4.

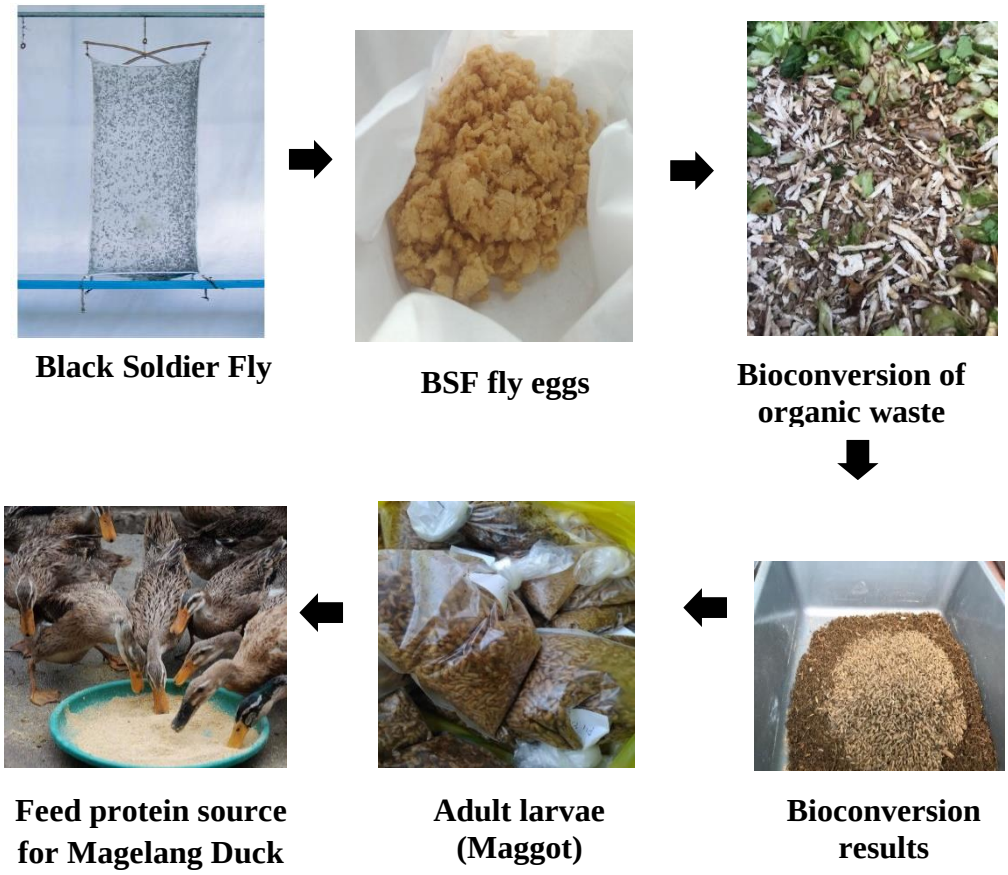

Figure 4. Science and technology process of bioconversion of organic waste using Hermetia illucens larvae for the production of maggot as a protein source

CONCLUSION

Magelang duck cultivation is potential cultivation, so it is necessary to strive for its sustainability. Availability of feed is one of the problems in the sustainability of Magelang duck farming. In addition, the waste problem is still a major problem for the environment. Therefore, the effort of bioconversion of organic waste using Hermetia illucens larvae is a solution to overcome these two problems. Massive training and mentoring efforts can be carried out to solve environmental and economic problems, especially for Magelang Duck breeders.

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