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Socialization of the Utilization of Rejected Bread and Expired Milk as Maggot Feed in Palaran Sub-District

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Abstract: *This socialization activity is a community service program that is carried out to build the lives of people in Handil Bakti, Palaran District, Samarinda City, East Kalimantan. This service aims to socialize the benefits of rejected bread and expired milk as maggot feed. So that farmers are independently able to utilize bread and milk waste into animal feed which can minimize the costs incurred. Through a participatory and collaborative approach, this program was attended by 15 people who work as maggot farmers, laying hen farmers, ornamental chicken farmers, and the surrounding community. The service was carried out using lecture and discussion methods by means of delivery by resource persons and direct discussion. It is hoped that this socialization can open farmers' insights about waste that has the potential to be used as maggot feed. The results obtained during the training were the participants' understanding of the benefits of rejected bread and expired milk which can be used as a source of maggot feed.*

INTRODUCTION

Waste is an issue in Indonesia. Large cities in Indonesia produce both organic and inorganic trash. Every year, millions of tons of food are wasted globally, including rotten or expired dairy goods and bread. This material is dumped and heaped in landfills without being processed, resulting in waste mountains. According to Ministry of Environment data, Indonesia's trash generation in 2021 was 29,567,204.00 tons/year, with food waste accounting for 39.11% (KLHK, 2021). The goal of organic waste utilization is to reduce the amount of organic waste generated during decomposition. trash treatment efforts strive to decrease trash while simultaneously creating economic value.

Milk and bread waste from businesses is one of the reasons for rising waste in Palaran, Samarinda, East Kalimantan. Despite their diminished quality, rejected bread trash and outdated

milk offer a considerable nutritional value, specifically protein and calories. Bread trash contains between 7 and 12% protein, depending on the type of flour used. Gluten, a mixture of two proteins, gliadin and glutenin, provides the majority of the protein in bread (Amicarelli et al., 2021). Milk contains approximately 3-3.5% protein, with casein and whey protein accounting for the majority. Milk protein is highly digested and biologically valuable, making it excellent for use as a feed source or raw material for fermentation (Sharma, et al. 2018).

One approach for waste treatment that generates economic value is to use maggot or black soldier fly larvae as an organic waste decomposer. BSF maggot is a BSF fly insect larva with the scientific name Hermetia illucens that feeds on organic waste piles such as food, fish, and animal waste to survive (Chia et al., 2020). Black Soldier Fly (BSF) larvae have the advantage of minimizing organic waste, are valuable as fish feed, and include microbial and antifungal properties. Maggots contain 45-50% protein and 24-30% fat (Meneguz et al., 2018; Wang et al., 2017). The maggot content will be used to feed animals and fish (Schiavone et al., 2017).

This community service program aims to promote community knowledge of organic waste processing, specifically milk and bread waste, and to give skills in BSF maggot cultivation. This service aids the environment by reducing waste, particularly milk and bread waste, and has a positive impact on the community's economy.

METHOD

The methods used for this activity were direct action review, lectures, discussions, and demonstrations (Alim, 2010; Mathis and Jackson, 2002). In general, the target audience for this activity was the existing farming community, especially those raising poultry, ornamental poultry lovers, farmer group members, and community leaders, in Handil Bakti, Palaran subdistrict. It is hoped that these participants will also be able to pass on this information to other farmers or other interested communities.

During the socialization activities, some of the tools and materials used included: contacts for the larvae, and plastic spoons. These tools were used to facilitate the process of feeding bread and expired milk to the larval boxes. Meanwhile, ingredients such as rejected bread and expired milk were used as the main components for maggot feed. This activity aims to provide alternatives to maggot farmers as an effort to fulfill maggot feed that is more economical and nutritious.

RESULT AND DISCUSSION

This service activity was attended by about 15 people, including maggot farmers, laying hens, ornamental poultry keepers, and members of the local community. The Palaran community's engagement, particularly that of farmers with maggot, chickens, and other bird species, is critical to the activity's success. The participation of participants can help to speed up the process of transmitting knowledge and technology in order to boost community knowledge and revenue, which can have an impact on future welfare.

Community service activities begin with a field survey to identify the issues facing farmers in the Palaran area (Arlina and Sabrina, 2018). The problem discovered is that there is a significant amount of rejected bread and expired milk in the Palaran neighborhood. Meanwhile, rejected bread and expired milk cannot be traded; they constitute garbage, which, if used, can support zero waste operations without costing money. Thus, maggots' ability to digest organic waste efficiently must be used to raise the value of rejected bread and expired milk.

Based on these issues, the resource person developed strategies and tools to address them. The discussion was followed by a material delivery session on maggot and organic feed. Farmers took involved in maggot feeding as a result of these actions.

Milk waste and rejected bread supply critical elements like protein, fat, and carbs, which promote maggot growth. According to Gold et al. (2020), maggots can quickly digest organic matter, reducing garbage stacks in landfills and greenhouse gas emissions. The use of leftover milk and rejected bread as maggot media not only reduces waste, but also generates larval biomass that can be used as alternative animal feed. Gold et al. (2018) discovered that maggots can reduce waste mass by up to 50% in a short amount of time, depending on the type and makeup of the garbage. Maggots are an essential bioconversion agent in organic waste management, particularly in agriculture and urban areas, due to their great efficiency in waste decomposition. Lalander et al. (2019) said that using maggots in organic waste management not only reduces trash volume but also has the potential to cut greenhouse gas emissions by up to 47% when compared to typical waste treatment methods such as composting. This makes maggot an environmentally favorable choice for organic waste treatment.

Bread and dairy waste disposed of in landfills without treatment can result in increased greenhouse gas emissions, mainly methane (CH_4) and carbon dioxide (CO_2) from anaerobic decomposition processes. Methane, produced by the breakdown of organic matter under anaerobic

circumstances, is a greenhouse gas with a global warming potential 25 times greater than that of carbon dioxide (IPCC, 2014). If rejected bread and expired milk are not properly handled, the accumulation of these wastes in landfills can contribute to greenhouse gas emissions and accelerate global climate change. Eriksson et al. (2015) found that food waste, including bread and dairy products, amounts for around 8-10% of total greenhouse gas emissions worldwide. This study discovered that food waste disposed of in landfills contributes significantly to methane gas generation, particularly when anaerobic conditions exist.

Rejected bread, which is high in carbohydrates, can also contribute to water pollution if it decomposes in large amounts in the environment. Vilariño et al. (2017) found that food waste, particularly carbohydrates and proteins like bread and milk, can increase nutrient levels in aquatic environments, speeding up eutrophication and threatening aquatic species.

Research that describes the level of danger that happens when expired bread and milk are not properly disposed of, which not only collects rubbish but also contributes to methane gas pollution and water contamination. As a result, this socializing exercise emphasizes the potential of bread and milk waste, assisting maggot farmers in obtaining alternate trash as maggot feed.

Surendra et al. (2020) shown that Black Soldier Fly (Hermetia illucens) larvae can decompose food waste, reducing waste volume by up to 50% while creating larval biomass suitable for animal feed. This adds value while lowering the environmental impact caused by organic waste accumulation.

Figure 1. Knowledge Transfer Process between Presenters and Socialization Participants

During this step of material distribution, the resource person interacted with the participants about maggot feed made from rejected bread and expired milk. The community, particularly farmers, is keenly interested, having traditionally relied solely on vegetable and fruit waste.

Meanwhile, rejected bread and outdated milk have significant protein and carbohydrate content, which promotes maggot growth and development. Farmers now have fresh knowledge that allows them to supply high-nutritional maggot feed.

After the community was presented with material on the benefits of giving rejected bread and expired milk to maggots, then the process of giving the remaining bread and milk to the box containing maggots was carried out. The following is a picture during the activity of giving rejected bread and expired milk to maggots.

Figure 2. The Process of Feeding Rejected Bread and Expired Milk to Maggots

This rise in maggot output is not only beneficial in overcoming the problem of organic waste, but it also aids in the fulfillment of chicken feed requirements, one of which can be obtained from maggots. Surendra et al. (2020) stated that maggot biomass has the potential to substitute expensive animal feed raw resources such as anchovies and fishmeal. Maggot-based feed production can lower feed production costs by up to 30%, which can greatly benefit the livestock and aquaculture industries.

Maggots have a high protein content, accounting for 40-50% of their dry weight, and a balanced amino acid profile. Maggots have a high fat content, ranging from 25-35% depending on the substrate used during their growth period. This makes maggots an extremely nutritious feed option for birds. Makkar et al. (2014) discovered that using maggots up to 25% of total feed can replace the majority of the protein demand from traditional sources without reducing poultry

output. This study also found that birds fed maggot-based diets gained weight and had higher feed efficiency than conventional diets.

The use of maggots as chicken feed has the potential to significantly increase productivity and feed efficiency while lowering production costs. Maggot feeding at a rate of 10-30% in poultry rations has been shown to be an effective way to supplement conventional protein sources without compromising poultry health.

In this session, the community was invited to participate and ask questions in order to promote and smooth the knowledge transfer process. This activity is for maggot farmers, laying hen farmers, and ornamental chicken farmers that want to empower rejected bread and expired milk that has not been used.

The participant's knowledge and abilities improved as a result of this training. Participants who were unaware that broken bread and old milk might be used as maggot feed now understand the benefits of maggots. This initiative can provide results, including the socializing of the use of rejected bread and expired milk, which can minimize waste. Furthermore, this practice allows farmers to meet their needs for nutritious maggot feed without spending a lot of money. Poultry farmers were able to recognize that feeding maggot to livestock by 10-30% can improve the performance and productivity of their livestock. The success indicator of this training activity is that rejected bread and expired milk can suffice as many as 7 maggot boxes measuring 50 x 30 cm and 2 maggot boxes measuring 140 x 100 cm.

CONCLUSION

From the training held in Handil Bakti, Palaran Subdistrict, outputs were obtained in the form of knowledge of the benefits of rejected bread and expired milk as maggot feed. Farmers are expected to be able to optimally utilize this rejected bread and expired milk so as to reduce the negative impact of bread and milk waste on the environment. In addition, the nutrients from bread and milk can increase the productivity of maggots. Thus, no more rejected bread and expired milk will be wasted without further processing. It is also hoped that the agriculture/livestock office in this area can facilitate regular assistance to the farming community so that various problems can be resolved.

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