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Dissemination and Training on Butterfly Pea Flower-Fortified Pasteurized Goat Milk in Trajumas Livestock Farmers' Group

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Abstract

Trajumas Livestock Farmers' Group in Kalirejo Village, Salaman District, Magelang Regency, is a dairy goat farming group that received assistance in pasteurized milk processing in 2024. As a follow-up, the 2025 community service activity focused on disseminating research results and providing training on the fortification of pasteurized goat milk with butterfly pea flower extract (*Clitoria ternatea*) to develop product added value. The activity was conducted from April to November 2025 through planning, program socialization, laboratory testing, research dissemination, training, and evaluation. Laboratory testing evaluated the microbiological and chemical quality of Sopera goat milk fortified with butterfly pea flower extract using different pasteurization methods. The research results served as the basis for preparing dissemination and training materials and were first presented at the 1st International Conference on Data Science for Food Sustainability (ICD4SS). Dissemination to the group was accompanied by practical training on producing pasteurized goat milk fortified with butterfly pea flower extract. Participants' understanding was evaluated using a post-test consisting of 10 dichotomous questions and categorized based on hypothetical norms. The evaluation showed that 18 of 20 participants (90%) were in the high understanding category, while 2 participants (10%) were in the moderate category, with no participants in the low category. This achievement met the established success indicator of at least 80% of participants being in the high understanding category. The activity was also supported by providing butterfly pea flower raw materials and extracts to support continued milk processing within the group.

Keywords: *adminara.id, digital transformation, education payment platform, school financial governance, technology acceptance*

INTRODUCTION

The Trajumas Livestock Farmers' Group is a dairy goat farming group located in Kalirejo Village, Salaman District, Magelang, Indonesia. The group raises Peranakan Etawa and Sopera dairy goats. The group continues to develop, with the dairy goat population increasing from 39 goats in 2023 to 64 goats in 2024. In 2024, the group received assistance in pasteurized milk processing through a community service program conducted by the Animal Science Study Program, Universitas Tidar. Following the implementation of the program, the group experienced a shift in mindset and knowledge regarding the processing of fresh goat milk (Hardyta et al., 2025). After acquiring basic knowledge of pasteurized milk processing, the development of value-added products became the next stage that needed to be introduced to the group. In 2025, the community service program was continued in the

form of disseminating research results on the fortification of pasteurized goat milk with butterfly pea flower extract (*Clitoria ternatea*). Goat milk is a source of animal protein that can serve as an alternative to cow's milk to meet the nutritional needs of the community. Goat milk has very good quality and is therefore often associated with various health benefits (Deviandini et al., 2023). Current trends in milk processing focus on fortification, namely increasing the nutritional value of milk through the addition of bioactive compounds from plant and animal sources. Scientific evidence indicates that fortified milk can provide health benefits (Bagheri et al., 2026).

Butterfly pea flowers are widely distributed in tropical countries. Butterfly pea flower petals contain abundant delphinidin-derived anthocyanin pigments and have various pharmacological effects such as antioxidant, antiglycation, antimicrobial, antiplatelet aggregation, anti-inflammatory, antipyretic, and anthelmintic activities, making them potentially suitable for addition to various foods and beverages (Chayaratanasin et al., 2019). The addition of butterfly pea flower extract effectively increases the antioxidant capacity of pasteurized cow's milk (Ismanto et al., 2025). Goat milk supplemented with butterfly pea flowers contains high levels of protein, lactose, and SNF, and is rich in antioxidants that are beneficial and nutritious for consumption (Ibrahim, 2024). In addition to its potential to improve product quality, milk fortification is an approach that has the potential to be widely applied and cost-efficient (Sharma et al., 2026) and therefore can be developed as a strategy to increase the added value of milk products within the farmers' group.

METHOD

This community service program was conducted in Kalirejo Village, Salaman District, Magelang Regency and at the Milk Processing Laboratory of UPA Taman Agroteknologi, Universitas Tidar. The program was conducted from April to November 2025. The target of this activity was 20 members of the Trajumas Livestock Farmers' Group. The main raw materials used in this community service activity were butterfly pea flowers and fresh goat milk from the Trajumas Livestock Farmers' Group. The main equipment used included a set of extraction equipment, equipment for microbiological and chemical quality testing of milk at the Milk Processing Laboratory of UPA Taman Agroteknologi, Universitas Tidar, a blender, a gas stove, stainless steel steaming pots with diameters of 30 cm and 40 cm, and a wooden spatula for milk processing at the Trajumas Livestock Farmers' Group secretariat. The community service activities consisted of the stages of planning, program socialization, laboratory testing, dissemination and training, mentoring, and evaluation.

The planning stage was carried out in April–May 2025 at the Milk Processing Laboratory of UPA Taman Agroteknologi, Universitas Tidar. This stage involved internal coordination of the community service team to identify the needs of the partners based on the agreement resulting from the 2024 community service activities. The program socialization stage was conducted in June 2025 at the group secretariat. The socialization activity involved delivering the implementation plan. The laboratory testing stage was conducted as part of a research study in July–September 2025 at the Milk Processing Laboratory of UPA Taman Agroteknologi, Universitas Tidar. This stage was conducted to investigate milk products from the Trajumas Livestock Farmers' Group fortified with butterfly pea flower extract.

Scientific data from the research were used as the basis for dissemination to the Trajumas Livestock Farmers' Group. Before being disseminated to the community, the data were presented at a scientific forum to obtain an exchange of ideas from academics. The dissemination and training stage for the group was conducted in October 2025. The activity was followed by evaluation through interviews and a post-test in November 2025. The level of participants' understanding after the activity was measured through a post-test consisting of 10 dichotomous items (score 0–10). The evaluation results were categorized based on the hypothetical norm (Azwar, 2012) into three levels: High (score 7–10), Moderate (score 4–6), and Low (score 0–3). The success indicator of the community service activity was achieved if the percentage of participants in the High category reached a minimum of 80%.

RESULTS AND DISCUSSION

The laboratory testing stage was conducted to obtain scientific information regarding the quality of Sapera goat milk from the Trajumas Livestock Farmers' Group fortified with butterfly pea flower extract (*Clitoria ternatea*) using different pasteurization methods. The research was conducted at the Milk Processing Laboratory of UPA Taman Agroteknologi, Universitas Tidar, from July to September 2025. This study evaluated the microbiological and chemical quality of milk based on pasteurization

method and butterfly pea flower extract concentration treatments. The test results showed that there was no interaction between pasteurization method and butterfly pea flower extract concentration on the observed parameters (Nurlaili, 2025). The research results subsequently served as the scientific basis for preparing dissemination and training materials for the Trajumas Livestock Farmers' Group. Before being disseminated to the group, the research results were presented at The 1st International Conference on Data Science for Food Sustainability (ICD4SS) in October 2025. The scientific forum served as a platform for obtaining feedback and exchanging ideas from academics as material for improving the materials to be delivered to the partners.

The dissemination and training activity was conducted on Saturday, October 11, 2025, at the residence of one of the members of the Trajumas Livestock Farmers' Group. The activity began with the dissemination of research results, followed by practical training on the production of pasteurized goat milk fortified with butterfly pea flower extract. The dissemination of research results in this activity served as a bridge between the knowledge generated through research and its application at the partner level. Research dissemination is important for increasing understanding and encouraging the implementation of research results outside the academic environment (Marín-González et al., 2016). In the context of technology transfer, partners not only need to obtain information but also need to understand, learn, integrate, and apply the solutions introduced (Holmén et al., 2025). Interaction between universities and partners through the delivery of materials and training provides opportunities for knowledge exchange and community capacity building (Karasik & Hafner, 2021). mixing of butterfly pea flower extract.

After the milk processing was completed, the participants tasted the product directly and gave positive responses. The post-test results showed that 18 of 20 participants (90%) were in the high understanding category with scores of 7–10, while 2 participants (10%) were in the moderate category with scores of 4–6. No participants were in the low understanding category. This achievement indicates that the activity success indicator, namely a minimum of 80% of participants being in the high understanding category, had been achieved. As a form of support for program sustainability, the community service team provided raw materials in the form of butterfly pea flower leaves as well as butterfly pea flower extract in dried and liquid forms. These materials are expected to be utilized by group members to continue the practice of producing pasteurized goat milk fortified with butterfly pea flower extract independently after the activity has ended. Capacity building and support that enable partners to apply introduced technologies can contribute to sustainable technology adoption (Abu harb et al., 2024).

CONCLUSION

The community service activity with the Trajumas Livestock Farmers' Group successfully disseminated research results on the fortification of pasteurized goat milk with butterfly pea flower extract and transferred knowledge and skills through practical training in milk processing. The evaluation results showed that 90% of the participants were in the high understanding category, indicating that the activity success indicator of a minimum of 80% of participants in this category was achieved. The provision of raw materials in the form of butterfly pea flowers and their extracts also supported the partners in continuing the processing of pasteurized goat milk fortified with butterfly pea flower extract independently.

DECLARATION OF GENERATIVE AI

The authors declare that no generative AI or AI-assisted technologies were used in the writing process of this manuscript.

CONFLICTING INTEREST STATEMENT

The authors states that there is no conflict of interest in the publication of this article.

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