Improving Tuna Chili Product Quality at KWT Larasati through Food Safety Education

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Abstrak

Keamanan pangan merupakan aspek krusial dalam produksi pangan olahan skala usaha mikro dan kecil, khususnya pada produk berbasis ikan seperti sambal tuna yang rentan terhadap kontaminasi dan penurunan mutu. Kegiatan pengabdian kepada masyarakat ini bertujuan untuk meningkatkan pengetahuan dan kesadaran pelaku usaha Kelompok Wanita Tani (KWT) Larasati terhadap penerapan prinsip keamanan pangan pada proses produksi sambal tuna. Kegiatan dilaksanakan pada tahun 2025 di lokasi produksi KWT Larasati melalui pendekatan edukatif dan partisipatif yang meliputi penyuluhan keamanan pangan, diskusi interaktif, serta pendampingan dan observasi langsung di area produksi. Evaluasi efektivitas kegiatan dilakukan menggunakan instrumen pre-test dan post-test untuk mengukur perubahan tingkat pengetahuan, serta checklist observasi berbasis prinsip Cara Produksi Pangan Olahan yang Baik (CPPOB) untuk menilai praktik higiene dan sanitasi. Data dianalisis secara deskriptif kuantitatif dengan membandingkan skor rata-rata pre-test dan post-test, serta secara kualitatif deskriptif terhadap hasil observasi lapangan. Hasil kegiatan menunjukkan peningkatan rata-rata skor pengetahuan keamanan pangan dari 48 menjadi 85 setelah intervensi edukasi. Selain itu, terjadi perbaikan awal pada beberapa aspek praktik keamanan pangan, meliputi peningkatan kesadaran higiene pekerja, kebersihan peralatan, penataan alur produksi untuk mengurangi risiko kontaminasi silang, serta kelengkapan informasi dasar pada label produk. Meskipun penerapan prinsip keamanan pangan belum sepenuhnya konsisten, kegiatan ini terbukti efektif sebagai langkah awal dalam meningkatkan pemahaman pelaku usaha dan mendorong perbaikan praktik produksi. Program pengabdian ini diharapkan menjadi dasar bagi penguatan penerapan CPPOB secara berkelanjutan guna meningkatkan mutu, keamanan, dan daya saing produk sambal tuna pada usaha pangan skala kecil.

Kata kunci: Edukasi keamanan pangan, Mutu produk, Usaha mikro dan kecil, Produk olahan ikan

Abstract

Food safety is a crucial aspect of small-scale processed food production, particularly for fish-based products such as tuna chili sauce, which are highly susceptible to contamination and quality deterioration. This community service program aimed to improve the knowledge and awareness of members of Kelompok Wanita Tani (KWT) Larasati regarding the application of food safety principles in tuna chili sauce production. The program was conducted in 2025 at the KWT Larasati production site using an educational and participatory approach, including food safety counseling, interactive discussions, and on-site mentoring and observation. The effectiveness of the program was evaluated using pre-test and post-test instruments to assess changes in participants' knowledge levels, as well as an observation checklist based on Good Manufacturing Practices for small and micro food enterprises (Cara Produksi Pangan Olahan yang Baik/CPPOB) to evaluate hygiene and sanitation practices. Data were analyzed using descriptive quantitative methods by comparing mean pre-test and post-test scores, and qualitative descriptive analysis of field observations. The results showed a substantial increase in the average food safety knowledge score from 48 to 85 after the educational intervention. Initial improvements were also observed in several food safety practices, including workers' personal hygiene, equipment cleanliness, production flow arrangement to reduce the risk of cross-contamination, and the completeness of basic product labeling information. Although the implementation of food safety principles has not yet been fully consistent, this program proved effective as an initial step in enhancing food safety

awareness and encouraging improvements in production practices. This community service program is expected to serve as a foundation for strengthening the sustainable implementation of CPPOB to improve the quality, safety, and competitiveness of tuna chili products in small-scale food enterprises.

***Keywords**: Food safety education, Product quality, Micro and small enterprises, Fish-based products*

INTRODUCTION

Food safety is a fundamental aspect of processed food production as it is directly related to consumer health protection and product quality assurance. Processed foods produced without proper hygiene and sanitation practices are at risk of physical, chemical, and microbiological contamination, which may lead to foodborne diseases and accelerated quality deterioration (Rahmayanti, 2022; Yulianti et al., 2022). The application of food safety principles is essential at every stage of food production, from raw material handling and processing to packaging and distribution, to ensure product safety and market competitiveness (Yulianti et al., 2022; Dewi et al., 2024).

Food safety problems are still commonly found in micro and small enterprises (MSEs). Limited knowledge of food safety principles, inadequate production facilities, and the lack of continuous technical assistance contribute to the low implementation of hygiene and sanitation standards in production processes. These conditions increase the risk of food contamination, reduce product quality consistency, and limit the ability of MSEs to comply with food safety regulations and licensing requirements ((Hasni et al., 2024; Suniati et al., 2025).

The risk of food safety issues is higher in fish-based processed products such as tuna chili sauce. Fish is a highly perishable food due to its high moisture and protein content, which supports microbial growth and requires proper hygienic handling and sanitation control (Cortes-Sanchez et al., 2024). Furthermore, poor equipment cleanliness, unsanitary working environments, and inadequate personal hygiene of workers can serve as sources of pathogenic microbial contamination, leading to quality deterioration and increased risks to consumer health (FAO, 2004; Rahmi et al., 2021).

KWT Larasati is a community-based enterprise producing tuna chili sauce as a local fishery-based flagship product. This product has considerable economic potential due to the utilization of local resources and broad market opportunities. However, preliminary observations indicated that the production process still relied on simple equipment and that hygiene and sanitation practices were inconsistently implemented. Identified problems included suboptimal equipment cleanliness, poorly organized production flow that may cause cross-contamination, and limited knowledge of basic food safety practices among producers. These conditions potentially reduce product quality and hinder competitiveness (Suniati et al., 2025).

If these conditions persist without improvement, the quality of tuna chili sauce may decline, product shelf life may shorten, and consumer complaints may increase. In the long term, this may reduce consumer trust and hinder business sustainability. Moreover, inadequate food safety implementation may become a barrier to obtaining food safety permits and expanding market access (Yulianti et al., 2022).

Several studies have shown that food safety education through training and mentoring can improve knowledge and encourage behavioral changes among small-scale food producers toward safer production practices ((Mujayanah et al., 2025; Palupi et al., 2023). However, many community service programs still rely on one-way socialization without measurable evaluation of knowledge and practice changes. Therefore, this community service program integrates interactive counseling, on-site mentoring, and pre-test and post-test evaluations to quantitatively measure the impact of education and link it to initial changes in food safety practices. This program aims to enhance the knowledge and awareness of KWT Larasati members regarding hygiene, sanitation, and simple process control as an initial step toward strengthening the sustainable implementation of Good Manufacturing Practices (CPPOB) to improve the quality, safety, and competitiveness of tuna chili sauce products.

METHODS

This community service program was conducted in 2025 at the KWT Larasati production site using an educational and participatory approach. This approach was selected because it has been shown to effectively improve knowledge and encourage behavioral change among small-scale food producers through active participant involvement in the learning process (Palupi et al., 2023; Qomariah et al., 2025). The participants were members of KWT Larasati directly involved in tuna chili sauce production, totaling approximately 15 individuals, including managers and active members. All participants were routinely engaged in daily production activities, ensuring the relevance and applicability of the materials delivered.

The program implementation consisted of preparation, counseling, on-site mentoring and observation, and evaluation stages. During the preparation stage, coordination was conducted with KWT Larasati representatives to determine the schedule, venue, and technical implementation of activities, and to develop educational materials based on CPPOB guidelines for micro and small enterprises (Suniati et al., 2025). Pre-test and post-test instruments and hygiene–sanitation observation checklists were also prepared as evaluation tools for initial food safety practices at the production site.

The counseling stage was conducted face-to-face using interactive lectures and discussions. The materials covered basic food safety concepts, sources and types of food contamination, hygiene and sanitation principles, and simple food safety practices applicable to tuna chili sauce production. An interactive approach was applied to encourage active participation, relate the materials to real production challenges, and enhance contextual understanding of food safety risks (Palupi et al., 2023).

The mentoring and on-site observation stage was conducted after the counseling session, focusing on direct observation of hygiene and sanitation practices during the production process. Assessment was performed using a CPPOB-based observation checklist to identify conformity between field practices and food safety principles. This mentoring stage aimed to assist participants in practically applying the materials and to provide immediate feedback on production practice improvements (Suniati et al., 2025; Qomariah et al., 2025).

The effectiveness of the program was evaluated by descriptively comparing pre-test and post-test scores to assess improvements in participants' knowledge levels. Field observation results were analyzed qualitatively to identify initial changes in hygiene and sanitation practices following the educational intervention. An increase in knowledge scores of ≥20 points and the emergence of at least three improvements in food safety practices were used as initial indicators of program success (Palupi et al., 2023).

RESULTS AND DISCUSSION

The community service program conducted at KWT Larasati focused on improving producers' knowledge and awareness of food safety principles in the processing of tuna chili sauce as a fish-based product. Food safety education was selected as the main approach because producers' knowledge is a fundamental determinant of successful food safety practice implementation in small-scale food enterprises (Yulianti et al., 2022; Dewi et al., 2024). Low levels of food safety knowledge among micro and small enterprises have been reported to correlate with a higher risk of food contamination and inconsistent product quality (Hasni et al., 2024).

The program activities included food safety counseling, interactive discussions, and on-site mentoring through direct observation at the production site (Figure 1). A communicative approach enabled the adaptation of materials to the partners' production habits. Discussions revealed that some participants had not previously understood the relationship between simple practices—such as hand hygiene, use of personal protective equipment (PPE), equipment cleanliness, and production flow arrangement—and the risk of food contamination. On-site observation played a crucial role in linking theoretical concepts with real production conditions, allowing participants to identify critical food safety control points in tuna chili sauce processing. Educational approaches combined with on-site mentoring have been reported to be more effective in promoting behavioral change than one-way socialization (Qomariah et al., 2025).



Figure 1. Food Safety Outreach, Observation, and Assistance Activities

Table 1. Observation Results of Food Safety Practice Implementation Before and After the Intervention

Assessed Aspect	Condition	
	Before Intervention	After Intervention
Implementation of food safety principles	Inconsistent application during production	Initial awareness of food safety principles has begun to emerge
Hygiene and sanitation	No written guidelines; hygiene–sanitation practices were inconsistent	Hygiene and sanitation practices began to be considered during production
Production layout and workflow	Workflow not well organized; potential cross-contamination risk	Workflow began to be rearranged to reduce cross-contamination risk
Equipment cleanliness	Equipment cleaning was not scheduled	Equipment cleaning began to be conducted more routinely
Workers' hygiene	Workers' hygiene was inconsistently applied	Awareness of personal hygiene among workers began to increase
Product information and labeling	Product label information was incomplete	Basic product information on labels began to be completed
Documentation and records	No production and sanitation records	Simple production and sanitation records began to be maintained

Pre-intervention observations indicated that the implementation of food safety principles at KWT Larasati was suboptimal. Workers' hygiene practices were inconsistent, the use of PPE was limited, and equipment cleaning was not conducted on a scheduled basis. In addition, the production layout was poorly organized, increasing the risk of cross-contamination between raw material, processing, and packaging areas. These findings are consistent with reports on micro and small food enterprises indicating that limited facilities and low hygiene–sanitation awareness are major contributors to high contamination risks (Table 1; Hasni et al., 2024; Suniati et al., 2025).

Following counseling and mentoring, initial improvements were observed in several food safety practices. Workers showed increased awareness of personal hygiene, equipment cleaning was conducted more routinely, and production flow arrangements began to be improved by separating raw material and finished product areas to reduce cross-contamination risks. The use of basic PPE began to be considered, although it was not yet consistently implemented. In terms of product information, partners started to complete basic labeling information. These changes indicate that educational interventions accompanied by on-site mentoring can promote the initial adoption of food safety practices in small-scale food enterprises (Table 2; Qomariah et al., 2025; Palupi et al., 2023).

Tabel 2. Changes in Food Safety Knowledge Scores Before and After the Intervention

Assessment Aspect	Mean Pre-test Score	Mean Post-test Score
Basic food safety knowledge	48	82
Workers' hygiene	45	85
Equipment and workplace sanitation	50	87
Sources and types of food contamination	43	80

Prevention of food contamination	52	85
Overall mean score	**48**	**85**

Knowledge evaluation using pre-test and post-test instruments demonstrated a substantial increase in scores following the educational intervention. The average knowledge score increased from 48 to 85, with the greatest improvements observed in worker hygiene and contamination prevention aspects. Knowledge improvement is a critical prerequisite for behavioral change in food safety practice implementation (Yulianti et al., 2022; Dewi et al., 2024). These findings are consistent with previous studies reporting that food safety training and education can improve knowledge and promote better hygiene–sanitation practices among small and micro food enterprises (Qomariah et al., 2025; Noviarmi et al., 2025).

The linkage between improved knowledge and initial improvements in food safety practices at KWT Larasati indicates that participatory educational interventions can serve as an effective initial strategy for strengthening the implementation of Good Manufacturing Practices (CPPOB) in small-scale food enterprises. Although the observed practice changes were still preliminary and not yet fully consistent, these findings highlight the importance of continuous mentoring and periodic evaluation to ensure sustainable behavioral change. A gradual implementation approach is considered more realistic for micro and small enterprises with limited resources than the direct application of comprehensive standards without adequate assistance (Suniati et al., 2025; Palupi et al., 2023).

CONCLUSION

The community service program implemented through food safety counseling and on-site mentoring at KWT Larasati successfully improved producers' knowledge and awareness regarding the application of food safety principles in tuna chili sauce processing. The observed increase in knowledge based on pre-test and post-test results was accompanied by initial improvements in food safety practices, particularly in workers' hygiene, equipment cleanliness, production flow arrangement to reduce cross-contamination risks, and the completeness of basic product labeling information. These findings indicate that an educational–participatory approach combined with field mentoring is effective as an initial step toward strengthening the implementation of Good Manufacturing Practices (CPPOB) in small-scale food enterprises.

However, the observed practice changes were still preliminary and not yet fully consistent, which may be attributed to the limited duration of mentoring and the partners' production facility constraints. Therefore, continuous mentoring and periodic evaluation are required to ensure the sustainability of behavioral change in production practices. Recommended follow-up actions include the development of simple hygiene and sanitation standard operating procedures (SOPs), assistance in improving hygienic production layout, and facilitation of compliance with food safety licensing requirements (PIRT/CPPOB) to strengthen the competitiveness and sustainability of KWT Larasati's business.

RECOMMENDATIONS

To ensure the sustainability of the community service program's impact and to strengthen food safety implementation at KWT Larasati, several follow-up actions are recommended. First, continuous and periodic mentoring is required to reinforce the consistent application of hygiene and sanitation practices during production, particularly in the use of personal protective equipment (PPE), scheduled equipment cleaning, and the separation of raw material and finished product areas to prevent cross-contamination. Second, the development and implementation of simple standard operating procedures (SOPs) for workers' hygiene, equipment sanitation, and production process control should be facilitated to enable more structured and consistent food safety practices.

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