

## **Application of Cold Smoked Chicken Technology to Increase Productivity of the Curah Leduk Poultry Farming Group, Banyuwangi**

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### **ABSTRACT**

The poultry group of Curah Leduk, Banyuanyar Village, Banyuwangi Regency has experience in raising and selling live chickens to collectors and traditional markets. However, their business is still limited to selling live chickens without any post-harvest processing, which restricts opportunities for value addition and causes around 10% of chickens to remain unsold due to low body weight. To address this issue, a program was introduced to develop smoked chicken products using cold smoking technology as a solution to utilize unsold chickens and expand market opportunities. This program applied cold smoking as a novel approach, replacing the commonly used hot smoking method with a low-temperature process. This method offers advantages such as better product texture, a more delicate flavor, and lower nutrient loss. The initiative aimed to improve the knowledge and skills of the poultry group through practical training in cold smoked chicken processing, reducing dependence on live chicken sales. The program was implemented through five main stages: coordination, socialization, direct practical training, evaluation, and mentoring. During processing, the cold smoking method resulted in an average weight loss of 6.1% due to evaporation of water and fat. All 15 participants showed a 100% increase in knowledge, particularly in calculating weight loss after training. Smoked chicken processing also increased product value by approximately 48.9% compared to fresh broiler chicken. The outcome showed that the activity improved participants' understanding of production cost estimation and selling price calculation based on weight loss, while also developing their practical skills to independently produce smoked chicken products.

**Keywords:** farming group, food, poultry, preservation, smoked chicken

### **INTRODUCTION**

Curah Leduk Village in Banyuwangi Regency, East Java, is one area with great potential in the poultry farming sector. This village is renowned for its broiler chicken production. However, most farmers rely on selling live chickens without post-harvest processing, meaning their income is greatly affected by price fluctuations and seasonal market demand. This village is renowned for its broiler chicken production. Most farmers rely on selling live chickens without post-harvest processing, so their income is greatly affected by price fluctuations and seasonal market demand.

A lack of post-harvest skills means that farmers are unable to maximize the added value

of their livestock products ([Abbas & Suhaeti, 2016](#)). One alternative that could increase sales value and expand market reach is the application of smoked chicken processing technology. This technology involves a smoking process that produces a distinctive flavour and extends the product's shelf life ([Setiarto et al., 2025](#)). This innovation not only supports the preservation of chicken meat but also enhances the sensory qualities of products that consumers desire ([Lakapu et al., 2017](#)).

A method of smoking that can be used is cold smoking, which involves smoking at a low temperature ranging from 30–45°C ([Lakapu et al., 2017](#)). The smoke produced during the smoking process is generated from indirect combustion ([Jamilatun et al., 2016](#)). The types of

wood that can be used include rubber and rambutan wood ([Barango et al., 2023](#)). Volatile organic compounds released from smoke from burning wood include various acids, aldehydes, and other substances. The study [Languille et al., \(2019\)](#) shown that acetic acid, aromatics benzene, toluene, C8-arom and C9-arom, and other volatile compounds in wood smoke play a role in imparting a distinctive aroma while also enhancing the shelf life of smoked meat products. The cold smoking method preserves the tenderness and moisture content of the meat, resulting in a more natural flavour without drying it out. Additionally, low-temperature smoking extends the product's shelf life without the need for synthetic preservatives. According to [Løvdal \(2015\)](#), the cold smoke method can inhibit the growth of spoilage microbes in chicken and fish products through the antimicrobial effects of phenolic compounds during the smoking process.

The cold smoking method is more economical for household use because it requires neither high temperatures nor excessive fuel. It can be carried out using simple equipment, such as a drum smoker ([Wardhana et al., 2025](#)).

From a production perspective, farmers in Curah Leduk Village tend to sell live chickens, which have a low profit margin. From a marketing perspective, around 10% of chickens remain unsold because they do not meet the market's ideal weight standard of around 1.5 kg per chicken. This causes losses for farmers because chickens below the standard weight are difficult to market. Therefore, a processing strategy for the poultry business is needed to improve efficiency and productivity.

This community service activity was carried out with the aim of increasing farmers' knowledge and skills through practical training in cold smoked chicken processing methods, as well as reducing farmers' dependence on the sale of live chickens. It is expected to increase the added value of livestock products, expand business opportunities for rural farmers, and strengthen the local culinary identity, all the while supporting the development of competitive local food innovations ([Setiarto et al., 2025](#)).

## METHODS

The community service activity was conducted in Curah Leduk Village, Banyuwangi Regency, from August to October 2025. The programme targeted 15 poultry farmers consisting of both men and woman in Curah Leduk, consisting of both men and women. It consisted of five stages: coordination, counselling, training, hands-on practice, evaluation, and mentoring, to ensure the transfer of applicable knowledge and skills ([Dewi et al., 2024](#)).

The coordination stage is a process of interaction between various elements or parties involved, with the aim of directing, harmonizing, and systematically organizing the implementation of activities so that uniformity of action towards the same goal is achieved. Coordination mechanisms, such as routines, meetings, plans, and schedules, impact the work of organizations by creating integrative conditions like accountability, predictability, and common understanding. These mechanisms help align the actions of various parties, ensuring that efforts are directed towards achieving the same objective ([Brosius et al., 2017](#)).

Coordination plays a key role in fostering commitment and clarifying the needs of partners, ensuring that activities are carried out in line with farmers' conditions and capabilities.

The outreach phase is designed to furnish farmers with a comprehension of product diversification, food safety, and the economic opportunities inherent in smoked chicken processing.

During this training and hands-on practice stage, farmers will be equipped with the technical skills to produce smoked chicken using the cold smoked method. This stage will include the selection and cleaning of broiler chicken carcasses, followed by weighing the carcasses and adding salt and garlic as seasonings. The chicken will then undergo a marination process to improve flavor and product quality. After marination, the carcasses will be processed using the cold smoking method at a controlled temperature of 30–45°C until 4 hours. The smoked chicken products will be packaged hygienically to maintain product quality, safety, and shelf life ([Fig. 1](#)).

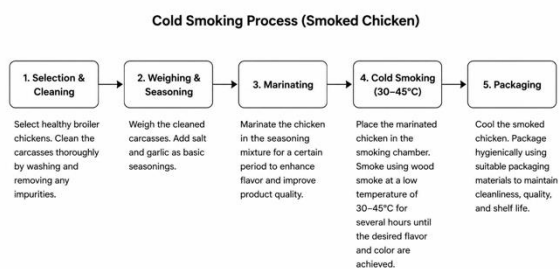


Figure 1. Cold smoking process

Practical training is conducted in groups under the guidance of community service team members, ensuring that farmers can implement simple operational standards and produce safe, high-quality smoked chicken products. Additionally, farmers are trained to assess product quality based on the characteristics of the meat's color, aroma, taste, and texture.

The evaluation of activities was conducted using qualitative indicators by observing the success rate of farmers in producing smoked chicken products with the desired characteristics in terms of color, aroma, texture, and packaging. Quantitative data were not used because the activity mainly focused on practical training and direct observation of farmers' ability to apply the cold smoking technique. Therefore, qualitative evaluation based on product characteristics such as color, aroma, texture, and packaging was considered more appropriate.

Skill improvement can be assessed through direct observation of farmers' ability to perform each stage of the cold smoking process. The evaluation is conducted by assessing the accuracy of carcass cleaning, weighing and seasoning procedures, marination process, temperature control during smoking at 30-45°C, and hygienic packaging techniques. In addition, skill achievement is also evaluated based on the quality of the final product, including the color, aroma, texture, and neatness of the smoked chicken packaging. Knowledge improvement can be assessed by counting the weigh loss of cold smoked chicken of farmers.

Group discussions are used to share experiences, convey technical obstacles, and design marketing and sustainability strategies for smoked chicken businesses. During these sessions, farmers are also guided through the process of creating digital platforms, such as Instagram, TikTok Shop, and websites. Follow-up mentoring takes place for one month after the training, involving field visits and technical consultations. The mentoring aims to strengthen

farmers' capabilities in developing their businesses independently.

## RESULTS AND DISCUSSIONS

The results of the activities show that the application of a step-by-step method, starting from coordination, counseling, direct practice, evaluation, to mentoring, is able to create a participatory and applicable learning process. During the coordination stage, the implementation team interacted with the head of the Curah Leduk Village poultry farming group to find out the problems faced by farmers in relation to chicken production and sales, which were limited to live chickens, and the fact that only 10% of live chickens were sold because they were below the standard weight (Fig. 2).



Figure 2. Coordination activities with farmers

The community service team provided an explanation of the activity plan, outlined the implementation steps, and determined the schedule of activities to be carried out jointly.

The educational material provides an understanding of the importance of diversifying chicken products to improve quality, shelf life, nutritional value, and economic value. (Alamsyah et al., 2019). One of the product diversifications is cold smoked chicken. This outreach activity also covered the differences between the cold and hot smoking methods, as well as product packaging, labelling, and marketing strategies. The material was delivered interactively through presentations and demonstrations of smoking equipment.

The training and practical stages (Fig. 3 and 4) were key to the programme's success, as they gave farmers real-world experience of applying chicken smoking techniques using the cold smoking method. The results showed that farmers were able to produce smoked chicken products independently. According to Handayani et al., (2020) this practice-based

approach has proven to be more effective than simply providing materials, as farmers learn through direct experience.



Figure 3. Training activities in cold smoked chicken production



Figure 4. Practice activities in cold smoked chicken production by farmers

During this practical activity, farmers were also invited to observe and count the weight loss from fresh chicken meat to smoked chicken. This is shown in [Table 1](#).

Table 1. Observation of weight loss in cold smoked chicken

Treatment (hour)	Replication			Mean (g)
	1	2	3	
0	1318	1120	1040	1159,3 <sup>a</sup>
1	1312	1116	1034	1154,0 <sup>a</sup>
2	1300	1102	1016	1139,3 <sup>b</sup>
3	1284	1092	1008	1128,0 <sup>b</sup>
4	1268	1008	990	1088,6 <sup>c</sup>

Different superscript letters in the same column indicate significant differences ( $p < 0.05$ ).

The results of the analysis of variance (ANOVA) showed that smoking duration has a significant effect on weight loss ( $p < 0.05$ ). The duncan multiple range test shows that the 0-hour and 1-hour treatments are not significantly different but are both significantly different from

the 2-hour and 3-hour treatments, and very significantly different from the 4-hour treatment. This indicates that the greater the smoking time, the greater the weight loss. According to [Bimantara et al., \(2015\)](#) the percentage of weight loss increased during the smoking process. According to [Rekanović \(2024\)](#) smoking causes water and fat to evaporate from chicken muscle tissue, resulting in a significant reduction in the product's final weight.

The smoking process used for chickens causes an average weight loss of 6.1% from the initial weight, according to observations. The 4 hours cold smoking process produced the best treatment for weight loss because it resulted in the highest and significantly different reduction in weight compared to the other treatments, indicating a more effective moisture reduction during smoking. This data also can be used by farmers as a reference for calculating the production costs and selling price of the final product. There was a 100% improvement in farmers' knowledge regarding weight loss calculation, as initially none of the 15 participants were able to calculate weight loss, while after the training all participants were able to perform the calculation correctly.

After completing the practical activities, an assessment was carried out to observe the enhancement of farmers' technical abilities in producing smoked chicken and to evaluate the quality of the products, focusing on attributes such as appearance, aroma, and texture ([Gómez et al., 2020](#)). This activity also involves evaluating packaging. Initially, farmers only sold live chickens, but they can now produce ready-to-sell processed products with a longer shelf life and a higher selling price as well as being able to brand products, package, and provide product information on smoked chicken with labeling. The smoked chicken product is shown in [Figure 5](#).



Figure 5. Cold smoked chicken products

Ongoing mentoring is an important factor in ensuring the sustainability of training results (Wardhana et al., 2025). With further guidance, farmers began independently implementing smoked chicken production (Fig. 6) and utilizing digital media to market their products. The total production cost of smoked broiler chicken was approximately Rp41,000/kg, consisting of Rp40,000/kg for broiler carcass and Rp1000 for seasonings. After smoking, the product weight decreased by 6.1%, resulting in a final weight of 0.939 kg. With a market price of Rp65,000/kg for smoked chicken, the actual selling price becomes Rp61,035, thereby increasing the product value by Rp20,035/kg or approximately 48.9%.



Figure 6. Farmers independently producing smoked chicken

This community service activity is expected to increase the economic value of livestock products and farmer productivity, given that smoked chicken commands a higher selling price than fresh chicken. Furthermore, farmers' participation in the production of smoked chicken supports the development of Banyuwangi's local culinary supply chain, which is renowned for its signature spicy chicken dish featuring smoked chicken as the primary ingredient. Activities of community service in Curah Leduk shown in Figure 7.



Figure 7. Activities of community service in Curah Leduk Poultry Farmers

## CONCLUSION

This activity enhanced the farmers' knowledge and skills in producing processed poultry products using local resources. There was a 100% increase in knowledge regarding weight loss calculation, as all 15 participants were able to calculate weight loss after the training. In addition, smoked chicken processing increased the product value by Rp20,035/kg or approximately 48.9% compared to fresh broiler chicken. The Curah Leduk poultry group is now able to independently produce cold-

smoked chicken and estimate production costs and selling prices.

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