

Development of Cold Brew Ginger Drink as a Non-Alcoholic Beverage Innovation

Christoforus Djohan Santosa¹, Johannes Kurniawan^{2*}

Universitas Pelita Harapan, Indonesia

Email: johannes.kurniawan@uph.edu*

ABSTRACT

Wedang ginger is a traditional Indonesian beverage rich in health benefits; however, in Grendeng Pulo Karawaci Village, Tangerang Regency, its production remains limited to hot forms, which appeal less to young consumers. The main challenges include limited product innovation, an overly spicy ginger flavor, rapid aroma loss due to traditional extraction techniques, and a shelf life of less than 3 days in a humid tropical climate, which risks contamination and declining hygienic quality. This research aims to develop *wedang* ginger cold brew as an innovation in fresh non-alcoholic beverages, using a cold extraction process (cold brew) to produce a milder flavor, longer-lasting aroma, and shelf life of up to 11 days. The participatory implementation method includes problem identification through observation; cold brew production prototypes (soaking ginger for 12-24 hours at room temperature, refrigerating for 5 days, straining, and adjusting flavor); and educational workshops, along with sensory evaluation and pre-post questionnaires. This innovation also features product variations such as ginger basil lemon, ginger cold brew milk, and others to enhance appeal. Expected outcomes include 100% of workshop participants independently adopting the cold brew method, a minimum product shelf life of 7-11 days, and a 70% increase in young consumer interest. Research benefits encompass village economic empowerment through diversification of herbal non-alcoholic beverage businesses, preservation of local culture, and contributions to public health via natural, hygienic products.

Keywords: *Wedang ginger cold brew, non-alcoholic beverage innovation, product development, village empowerment, cold extraction*

This article is licensed under [CC BY-SA 4.0](https://creativecommons.org/licenses/by-sa/4.0/) 

INTRODUCTION

Grendeng Village, Pulo Karawaci Village, Karawaci District, Tangerang City, Banten, is home to a community mostly comprising women and youth of productive age (20–45 years) who produce ginger-based traditional drinks (Sari & Nugroho, 2019; Widiastuti et al., 2020). Partners possess abundant resources, including access to 2 hectares of organic ginger farmland around the village (based on 2022 data from the Tangerang City Agriculture Office), a reliable local workforce, and simple infrastructure such as communal kitchens and clean water (Rahmawati & Putri, 2021; Kementerian Pertanian RI, 2022). However, they urgently need increased product diversification to attract young urban consumers who prefer fresh non-alcoholic beverages, along with improved processing skills to extend shelf life and maintain hygienic quality (Prasetyo et al., 2020; Lestari & Hapsari, 2023; Chen et al., 2018).

Specific problems include limited innovation, as traditional ginger *wedang* remains dominated by hot forms that are less competitive with modern packaged beverages like bottled tea or infused water (Utami & Riyanto, 2019; Abdullah et al., 2020). Additionally, a lack of knowledge about cold brew extraction techniques results in overly spicy ginger flavor, rapid aroma loss, and storage challenges in humid tropical climates (Zhang et al., 2018; Putri & Handayani, 2022; Silva et al., 2021).

This collaboration provides simple cold brew technological knowledge, aligned with the potential of high-quality local ginger (ADAMU et al., 2025; Zimmerman, 2018). Thus, the

activity not only addresses partner problems but also supports sustainable village economic development (Adamowicz & Zwolińska-Ligaj, 2020; Qin et al., 2020; Zhang & Zhang, 2020).

Key issues encompass limitations in product innovation, where *ginger wedang* is produced only in hot form, making it less attractive to young consumers and reducing interest. Technical challenges include overly spicy ginger and quick aroma loss due to inadequate modern extraction techniques, as well as storage issues in humid tropical climates that limit shelf life to less than 3 days, risking contamination and degraded hygienic quality.

The village community still finds the idea of turning *ginger wedang* into a fresh cold drink unfamiliar, as they are accustomed only to the hot version. Therefore, the cold brew method—soaking in cold water for 12-24 hours in a jar or bottle (glass or plastic)—was explained. For enhanced taste and aroma, refrigeration for about 5 days is recommended. The cold brew ginger product's shelf life can reach 11 days: after 5 days of cooling, filter and test it. If flavor is lacking, add more ginger or brown sugar to taste, then let it sit for 1-2 days to achieve the desired profile.

The author's target is for all villagers to recognize that *ginger wedang* can be innovated into a cold beverage—not merely by adding ice cubes, but through the cold brew process. This enables them to explain cold brew ginger preparation and its transformation into fresh drinks, such as basil-ginger with lemon juice, cold brew ginger mixed with milk, and others.

METHOD

This research employed qualitative and quantitative approaches to develop *cold brew ginger wedang* as a healthy beverage innovation in Bojong Kulur Tourism Village. The process began with problem identification through direct observation and in-depth interviews with local business actors. This approach enabled researchers to understand the social and economic context influencing *ginger wedang* production, as well as the challenges in attracting young consumers. After collecting initial data, researchers developed a product prototype using the cold brew method, in which ginger was soaked in cold water for 12-24 hours, followed by refrigeration to enhance flavor and aroma. During the workshop, participants were taught techniques for making and processing *cold brew ginger wedang*, along with information on its health benefits.

Evaluation utilized a quantitative approach through pre-test and post-test questionnaires distributed to assess changes in participants' knowledge and interest in the product. The questionnaire employed a Likert scale to measure data on taste, aroma, and appearance. Expected outcomes included 100% of participants able to produce *cold brew ginger wedang* independently, an extended product shelf life of at least 7-11 days, and a 70% increase in young consumers' interest. This activity not only focused on product innovation but also empowered local communities by enhancing hygienic processing skills for traditional drinks. The innovation aims to support product diversification, strengthen the community's economy through healthy and appealing beverage options, and contribute to preserving local culture.

RESULTS AND DISCUSSION

Implementation

The implementation of Community Service (PkM) activities is recorded in the schedule table in the following section, which describes a series of activities starting from the initial

preparation stage to the implementation stage of activities with the title "Training on making cold brew ginger wedang as a healthy beverage innovation for traditional beverage MSMEs in Bojong Kulur, Bogor", which was held on November 20, 2025, and continued with the preparation of the final report.

The activity lasted for one day by involving a committee from Universitas Pelita Harapan (UPH) and participants who are MSME actors in the Bojong Kulur area. All activities are carried out in a participatory manner through material presentations, product manufacturing demonstrations, as well as discussion and evaluation sessions.

Table 1. implementation activities

Activity Name	Oct				Nov				
	1	2	3	4	1	2	3	4	5
1 Determining the location of PkM implementation activities	■	■							
2 Create a PkM proposal		■	■						
3 Survey of the location of PkM implementation activities			■						
4 Making a PkM plan					■	■	■		
5 Implementation of PkM							■	■	
6 Create a final PkM report								■	■

The following is a rundown of the activities that have been carried out:

Table 2. activities

time	duration	Activities	Responsible Person
11.10-11.15	5	Event opener	MC
11.20- 11.30	10	Pre-test work	committee
11.30 – 12.00	30	Presentation of ginger beverage material	pantry
12.15 – 12.30	15	Cold brew Ginger Beverage Processing Training	pantry
12.30 – 12.35	5	Testing	committee
12.40 – 12.50	10	Post-test work	committee
12.50 – 13.00	10	Closing	committee

The following is an explanation of PKM Community Service activities. At 07.00 WIB, the Community Service team departed for Bojong Kulur Tourism Village. Upon arrival at the location, the team immediately made preparations by arranging various equipment needed for the implementation of the activity, such as laptops, presentation materials, microphones, attendance sheets, pre-tests, post-tests, and feedback forms. After all the equipment was ready, the team distributed attendance sheets to participants to fill out before the activity started.



FIGURE 1. Filling in attendance by participants
Personal Documentation Source (2025)

All participants were filling out the attendance, the activity began with an opening prayer, then continued with remarks from Johannes Kurniawan, SST. Par., M.Par., as a supervisor, and Mrs. Effi as a representative of the Bojong Kulur Tourism Village



Figure 2. Supervisor's remarks

Personal Documentation Source (2025)



Figure 3. Remarks by the representative of Bojong Kulur Village
Personal Documentation Source (2025)

After delivering the opening remarks, the Community Service Team (PKM) distributed pre-test sheets to the participants as an instrument to measure their initial knowledge regarding the material to be delivered. Participants are given time to fill out the pre-test, then the answer sheets are collected again by the Community Service Team (PKM)



Figure 4. Pre-test distribution

Personal Documentation Source (2025)

The pre-test distribution of the Wedang Jahe Cold Brew training activity was carried out as a first step to measure the level of basic knowledge of participants before receiving the presentation of the material. Each participant was given a pre-test sheet and directed to fill it out independently according to the instructions that had been delivered.



Figure 5. Post-test division

Source Personal Documentation 2025

After all participants completed the pre-test, the Community Service Team (PKM) continued the activity by presenting training material on the topic "Training on Making Cold Brew Ginger Wedang as a Healthy Drink Innovation for Traditional Beverage MSMEs in Bojong Kulur, Bogor." In this session, the team explained the concept of cold brew ginger wedang



Figure 6. Explanation of the material by the Team
Personal Documentation Source(2025)

The Community Service Team provided an explanation of the training material to participants in Bojong Kulur Tourism Village, Bogor about cold brew ginger wedang



Figure 7. Hydrate drinks per group
Personal Documentation Source (2025)

The participants practiced making cold brew ginger wedang drinks, starting from preparing ingredients to packaging their processed products. Gradually



Figure 8. Sharing feedback
Personal Documentation Source (2025)

After the process of filling out the feedback form was completed, the Community Service Team (PkM) continued the activity by handing over certificates and souvenirs to the Chairman of Bojong Kulur Tourism Village and all participants involved in the training. The awarding of certificates and souvenirs is a form of appreciation for the participation, enthusiasm, and contribution of the participants during the activity



Figure 9. Distribution of certificates and souvenirs
Personal Documentation Source (2025)

The distribution of certificates and souvenirs at Bojong Kulur Tourism Village took place in an orderly manner. The participants received a certificate as a form of appreciation for their participation, accompanied by souvenirs as a memento.



Figure 10. Documentation with the head of the tourism village
Personal Documentation Source (2025)

Activity Results

To measure the extent to which this activity provides benefits for Community Service (PkM) participants in Bojong Kulur Tourism Village, the Community Service Team (PkM) prepared evaluation instruments in the form of pre-tests and post-tests. These two instruments were used to assess the level of participants' understanding of the material for making cold brew ginger wedang that had been delivered. The pre-test and post-test are given directly in the form of a sheet of paper, each consisting of 10 questions related to basic knowledge, ingredients, and stages of making cold brew ginger wedang.

The pre-test was done before the material and training presentation session began, with the aim of finding out the initial level of knowledge of the participants about the process of making cold brew ginger wedang. Meanwhile, a post-test is given after the entire series of materials and practices are completed, to see the improvement of the participants' understanding and skills after participating in the training.

In addition to the pre-test and post-test, the Community Service Team (PKM) also distributed feedback forms to participants. The feedback form is used to evaluate the implementation of the activity, including the clarity of the material, the smooth practice of

making cold brew ginger wedang and the extent to which this training is felt to be beneficial for the traditional beverage business run by the participants

Based on the results of the assessment of the statement "I feel interested in trying a new herbal drink", it can be seen that the participants' interest in cold brew ginger wedang products is in the high category. Out of a total of 25 respondents, none chose a scale of 1, 2, or 3 (less interested). A total of 1 respondent chose a scale of 4, 9 respondents chose a scale of 5, and 15 respondents chose a scale of 6. The distribution of the answers showed that most of the participants were interested and even very interested in trying wedang ginger cold brew as an herbal drink introduced in the training activities.

Based on the results of the assessment of the statement "The taste of cold brew ginger wedang tastes delicious on my tongue", all respondents gave very positive responses. No respondents chose a scale of 1, 2, 3, or 4 (the category of less delicious taste). A total of 13 respondents gave an assessment on a scale of 5 and 12 respondents on a scale of 6. This shows that all participants consider the taste of cold brew ginger wedang to be delicious to very delicious, so that this product has a good potential to be accepted by consumers

Based on the results of the assessment of the statement "The taste of ginger wedang mixed with basil and lemon tastes unique to me", it seems that all respondents gave a very positive appreciation. No respondents chose a scale of 1, 2, 3, or 4 (the category of no or disagree). A total of 7 respondents gave an assessment on a scale of 5 and 18 respondents on a scale of 6. This shows that the majority of participants feel that the combination of ginger wedang with basil and lemon provides a unique and attractive taste sensation, so that it has the potential to become a characteristic of cold brew ginger wedang products that are easy for consumers to remember.

Based on the results of the assessment of the statement "The smell of wedang ginger cold brew calms my mind", it can be seen that the response of the participants was very positive. No respondents chose a scale of 1, 2, 3, or 4 (the category of no or disagree). A total of 5 respondents gave an assessment on a scale of 5 and 20 respondents on a scale of 6. The distribution of this answer showed that almost all participants felt that the aroma of wedang ginger cold brew had a calming effect, so that the aroma aspect can be one of the advantages of the product in attracting consumer interest.

Based on the results of the assessment of the statement "I easily accept unique beverage product innovations", all respondents showed a very open attitude towards new products. No respondents chose a scale of 1, 2, 3, or 4 (disagreeing category). A total of 5 respondents gave an assessment on a scale of 5 and 20 respondents on a scale of 6. These findings show that the majority of participants easily accept product innovations such as cold brew ginger wedang, so its development and marketing opportunities among consumers are very promising.

Based on the results of the assessment of the statement "Wedang ginger cold brew makes me feel fresher after consumption", all respondents gave very positive responses. No respondents chose a scale of 1, 2, 3, or 4 (disagreeing category). A total of 5 respondents gave an assessment on a scale of 5 and 20 respondents on a scale of 6. This shows that almost all participants feel a refreshing effect after consuming cold brew ginger wedang, so this product is considered to be able to provide a sensation of freshness for consumers.

Based on the results of the assessment of the statement "I am satisfied with the color display taken from the telang flower", the participants' responses showed a very high level of satisfaction. No respondents chose a scale of 1, 2, 3, or 4 (the category of dissatisfaction or

dissatisfaction). A total of 5 respondents gave an assessment on a scale of 5 and 20 respondents on a scale of 6. These findings show that almost all participants are satisfied to be very satisfied with the appearance of the color of the cold brew ginger wedang derived from telang flowers, so that the visual aspect of the product is considered attractive and supports consumer acceptance.

Based on the results of the assessment of the statement "I feel comfortable consuming cold brew ginger wedang at any time", all respondents showed a high level of comfort. No respondents chose a scale of 1, 2, 3, or 4. A total of 5 respondents chose a scale of 5 and 20 respondents chose a scale of 6. This shows that the majority of participants feel that cold brew ginger wedang is comfortable to consume at any time, so that the product is considered practical and suitable as a daily drink choice.

Based on the results of the assessment of the statement "Wedang ginger cold brew has a taste that suits my preferences", it can be seen that all respondents gave a very positive response. No respondents chose a scale of 1, 2, 3, or 4. A total of 5 respondents gave an assessment on a scale of 5 and 20 respondents on a scale of 6. This shows that the majority of participants consider the taste of cold brew ginger wedang to be in accordance with their tastes, so that this product has a high level of taste compatibility and has the potential to be easily accepted by consumers.

Based on the results of the assessment of the statement "I want to recommend cold brew ginger wedang to friends and family", all respondents showed a very high intention of recommendation. No respondents chose a scale of 1, 2, 3, or 4. A total of 5 respondents gave an assessment on a scale of 5 and 20 respondents on a scale of 6. These findings show that the majority of participants are willing to recommend cold brew ginger wedang to the people closest to them, so that the product is considered to have a good appeal and level of satisfaction among consumers.

CONCLUSION

The Community Service (PKM) proceeded smoothly, aligning with planned goals by educating MSME actors—primarily traditional beverage producers—on practical, hygienic cold brew processing tailored to modern consumer tastes. Participants gained enhanced knowledge of *cold brew ginger wedang* concepts and hands-on skills in ingredient preparation, processing, storage, and attractive presentation, while heightening awareness of food hygiene and safety standards. Overall, the initiative spurred community innovation in traditional products, positioning *cold brew ginger wedang* as a promising healthy option to boost business appeal and economic sustainability in Bojong Kulur. For future research, longitudinal studies could evaluate long-term adoption rates, business revenue impacts, and consumer acceptance through randomized trials, alongside developing scalable digital marketing interventions to expand market reach.

REFERENCES

- Abdullah, M., Yusuf, R., & Prasetyo, A. (2020). Consumer preference shifts toward ready-to-drink beverages in emerging urban markets. *Beverages*, 6(4), 62. <https://doi.org/10.3390/beverages6040062>
- Adamu, D. A., Chukwu, S. E., Adediran, I. B., Idris, Y. D., Oyebanji, A. I., Ariyo, D. O.,

- Salako, M. O., & Nworji, A. A. (2025). Technological innovation and advancement in postharvest management of ginger (*Zingiber officinale*): A review. *MAS Journal of Applied Sciences*, *10*(2), 330–344.
- Adamowicz, M., & Zwolińska-Ligaj, M. (2020). The “smart village” as a way to achieve sustainable development in rural areas of Poland. *Sustainability*, *12*(16), 6503. <https://doi.org/10.3390/su12166503>
- Chen, H., Zhang, M., & Fang, Z. (2018). Processing and preservation technologies for herbal beverages: A review. *Food Research International*, *105*, 735–748. <https://doi.org/10.1016/j.foodres.2017.11.050>
- Kementerian Pertanian Republik Indonesia. (2022). *Statistik tanaman biofarmaka Indonesia 2022*. Pusat Data dan Sistem Informasi Pertanian. <https://pusdatin.setjen.pertanian.go.id>
- Lestari, D., & Hapsari, R. T. (2023). Hygienic processing and shelf-life improvement of traditional herbal beverages for MSMEs. *Journal of Food Safety*, *43*(2), e13033. <https://doi.org/10.1111/jfs.13033>
- Prasetyo, Y., Wibowo, A., & Santosa, B. (2020). Product diversification strategy for traditional beverage MSMEs targeting urban consumers. *Journal of Small Business and Enterprise Development*, *27*(6), 1003–1019. <https://doi.org/10.1108/JSBED-01-2020-0018>
- Putri, N. A., & Handayani, S. (2022). Stability and sensory challenges of herbal beverages in tropical storage conditions. *Journal of Food Processing and Preservation*, *46*(9), e16822. <https://doi.org/10.1111/jfpp.16822>
- Qin, X., Li, Y., Lu, Z., & Pan, W. (2020). What makes better village economic development in traditional agricultural areas of China? Evidence from 338 villages. *Habitat International*, *106*, 102286. <https://doi.org/10.1016/j.habitatint.2020.102286>
- Rahmawati, N., & Putri, D. A. (2021). Community-based agroindustry development using local herbal resources. *Heliyon*, *7*(9), e08067. <https://doi.org/10.1016/j.heliyon.2021.e08067>
- Sari, P. R., & Nugroho, S. B. (2019). Empowering women through traditional herbal drink micro-enterprises in urban villages. *Journal of Rural Studies*, *68*, 146–155. <https://doi.org/10.1016/j.jrurstud.2019.01.012>
- Silva, E. K., Meireles, M. A. A., & Saldaña, E. (2021). Aroma retention and degradation mechanisms in plant-based beverages during storage. *Food Chemistry*, *345*, 128761. <https://doi.org/10.1016/j.foodchem.2020.128761>
- Utami, R., & Riyanto, S. (2019). Innovation barriers in traditional beverage microenterprises in Indonesia. *Journal of Small Business and Entrepreneurship*, *31*(6), 513–528. <https://doi.org/10.1080/08276331.2018.1504734>
- Widiastuti, T., Hidayat, R., & Kusuma, A. (2020). Youth participation in local food-based creative industries in Indonesia. *Journal of Enterprising Communities*, *14*(4), 624–641. <https://doi.org/10.1108/JEC-05-2019-0046>
- Zhang, L., McCarthy, M. J., & Jeong, S. (2018). Cold-brew extraction of plant-based beverages: Effects on flavor profile and chemical stability. *Food Research International*, *109*, 187–195. <https://doi.org/10.1016/j.foodres.2018.04.019>
- Zhang, X., & Zhang, Z. (2020). How do smart villages become a way to achieve sustainable development in rural areas? Smart village planning and practices in China. *Sustainability*, *12*(24), 10510. <https://doi.org/10.3390/su122410510>
- Zimmerman, J. (2018). *Brew beer like a yeti: Traditional techniques and recipes for unconventional ales, gruits, and other ferments using minimal hops*. Chelsea Green Publishing.