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Utilization of Corn Silk Waste as Functional Tea through Community Socialization, Training, and Acceptability Evaluation at the Alaurodussalafiyah Foundation

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Abstract:

Corn silk (*Zea mays L.*), commonly discarded as agricultural waste, contains bioactive compounds with potential functional and health benefits. However, its utilization at the community level remains limited due to insufficient knowledge and processing skills. This community service program aimed to enhance food literacy, reduce organic waste, and promote small-scale entrepreneurship through the utilization of corn silk as a functional herbal tea at the Alaurodussalafiyah Foundation, Mataram City.

The program was implemented using a participatory empowerment approach involving women from *majelis taklim*, adolescent students, and foundation administrators. Activities were conducted through socialization sessions, hands-on training in corn silk tea processing, and a brewing demonstration followed by a simple organoleptic evaluation. The production process included raw material selection, washing, withering, drying, size reduction, and packaging into tea bags. Program evaluation was carried out through participatory observation, question-and-answer sessions, and sensory acceptance testing.

The results showed high participant engagement and improved understanding of functional food concepts and hygienic processing practices. Participants were able to independently produce corn silk tea using simple and locally accessible methods. Organoleptic evaluation indicated good consumer acceptance, with 80% of panelists favoring the color, 75% rating the aroma as pleasant, and 70% reporting acceptable taste. In addition, the activity contributed to reducing organic waste and increasing awareness of sustainable food utilization.

Overall, the program demonstrates that community-based corn silk tea production can serve as an effective model for food-based empowerment, functional food education, and the valorization of agricultural by-products.

Keyword: corn silk waste; functional tea; community empowerment; food literacy

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Introduction

The Alaurodussalafiyah Foundation, located in Sayang-Sayang Subdistrict, Cakranegara District, Mataram City, is a community-based religious institution actively engaged in Islamic education, *majelis taklim* activities, and non-formal community development programs. Beyond its educational and religious roles, the foundation faces a growing need to strengthen community economic capacity through productive activities that are halal, hygienic, and value-added. Food-based economic empowerment represents a particularly relevant strategy, as the foundation's community predominantly consists of women from *majelis taklim* groups, foundation

administrators, and adolescent students who require simple, feasible, and sustainable entrepreneurial skills. Community empowerment approaches that utilize locally available resources and agricultural by-products are therefore highly aligned with grassroots-based microenterprise development.

Corn silk (*Zea mays L.*), commonly regarded as agricultural waste, has attracted increasing scientific attention due to its bioactive composition. Numerous studies have reported that corn silk contains polyphenols, flavonoids, tannins, saponins, as well as essential minerals and vitamins, making it a promising raw material for functional beverages and health-related products (Thaiwong, 2020; K.-J. Wang & Zhao, 2019). These bioactive compounds contribute to antioxidant capacity and other physiological benefits, supporting the repositioning of corn silk from waste material to functional food ingredient.

A notable study entitled *"Corn silk: a source of natural antioxidants with α-amylase, α-glucosidase, advanced glycation and diabetic nephropathy inhibitory activities"* demonstrated that corn silk extract exhibits strong antioxidant activity and significant inhibitory effects on α-amylase and α-glucosidase enzymes, which are closely associated with diabetes management and its complications (K.-J. Wang & Zhao, 2019). In addition, phenolic and flavonoid compounds present in corn silk have been shown to play an important role in protecting cells against oxidative stress (Hartanto & Swasti, 2018; Thaiwong, 2020).

In daily consumption practices, corn silk is commonly dried and brewed with hot water to produce an herbal infusion known as corn silk tea. The simplicity of processing and the wide availability of raw materials make this product highly suitable for household-scale production and community-based functional food development. However, previous studies indicate that the quality of corn silk tea—including phenolic content, flavonoid concentration, vitamin levels, as well as sensory attributes such as color, aroma, and taste—is strongly influenced by production parameters such as harvest maturity, withering duration, drying time, and drying methods (Garnida et al., 2018; Hartanto & Swasti, 2018; Thaiwong, 2020). For instance, variations in drying temperature and corn variety have been reported to significantly affect vitamin C content, infusion color, and flavonoid levels in dried corn silk (Garnida et al., 2018).

Despite its functional potential and relatively simple processing, the utilization of corn silk at the community level remains limited. In religious-based community environments such as the Alaurodussalafiyah Foundation, human resources and raw materials are readily available; however, structured training on processing procedures, health benefits, hygienic production practices, and basic packaging techniques is largely absent. Consequently, corn silk continues to be discarded as waste rather than transformed into a value-added product.

This condition reflects a clear gap between the scientific evidence supporting corn silk as a functional food ingredient and the practical capacity of the community to utilize it effectively. Therefore, educational and skill-based intervention programs are essential to bridge this gap and enable communities to adopt simple food processing technologies grounded in scientific principles.

Based on these considerations, a socialization and training program on the utilization of corn silk as a functional herbal tea was designed and implemented at the Alaurodussalafiyah Foundation with the following objectives:

1. To enhance participants' knowledge and practical skills in proper corn silk tea processing, including raw material selection, drying procedures, brewing techniques, and hygienic handling.

2. To reduce corn silk waste in the surrounding community environment through value-added utilization.
3. To encourage the formation of small-scale herbal-based entrepreneurial initiatives within the foundation, thereby contributing to community economic empowerment and increasing the value of local agricultural by-products.

Accordingly, this program is not only technically and academically relevant but also offers practical contributions to community empowerment, agricultural waste management, and the provision of alternative healthy and functional beverages.

Method

Location and Time of Implementation

The community service activities were conducted at the Alaurodussalafiyah Foundation, located in Sayang-sayang Subdistrict, Cakranegara District, Mataram City, Indonesia. The program was implemented through two training sessions held on September 12 and 14, 2025. All activities took place at the foundation hall with the support of foundation administrators and community members.

Participants

Participants consisted of members of the Alaurodussalafiyah Foundation community, including women from the majelis taklim, adolescent students, and foundation administrators. The number of participants ranged from 10 to 20 individuals. Participants were selected based on their active involvement in foundation activities and their interest in developing household-scale productive skills.

Community Empowerment Approach

The implementation of this community service program adopted a participatory empowerment approach, emphasizing knowledge transfer, skill development, and active involvement of participants throughout the activities. The program was carried out through three main stages:

Tools and Materials

The tools used in this activity included drying trays, washing basins, stainless steel scissors, drying racks, draining cloths, and tea bags. The primary raw material was fresh corn silk, which was sourced from the surrounding environment of the foundation.

Activity Stages

The activity stages were designed to enhance participants' awareness of agricultural waste utilization and to improve their understanding of food safety, product quality, and the functional value of corn silk tea. The program consisted of three main stages:

(1) basic socialization and educational sessions on waste utilization and functional beverages;
(2) technical training on corn silk tea processing, including cleaning, drying, and packaging; and
(3) demonstration of tea brewing followed by a simple organoleptic evaluation conducted by the participants.

Activity Evaluation

Evaluation of the program was carried out using the following approaches:

(1) simple question-and-answer sessions to assess improvements in participants' awareness and knowledge;
(2) participatory observation to evaluate participant engagement during practical activities; and
(3) organoleptic assessment as an indicator of the success of the tea production process.

Activity Documentation

All activities were documented through photographs and field notes. This documentation served as evidence of program implementation and as a basis for reporting and planning future sustainability of the community service activities.

Results and Discussions

1. Implementation of Socialization and Training Activities

The socialization and training activities were conducted in a structured and participatory manner, involving multiple target groups at the Alaurodussalafiyah Foundation, including women from the majelis taklim, adolescent students, and foundation administrators. In the initial stage, participants were introduced to the potential of corn silk (*Zea mays L.*) as a functional food ingredient. The introductory materials covered the presence of bioactive compounds, potential health benefits, and opportunities for small-scale product development based on locally available natural resources.

The socialization session was well received, as indicated by active discussions and participant engagement. Participants raised questions regarding consumption safety, possible combinations with other herbal ingredients, and basic marketing strategies for simple herbal products within the foundation environment. This interactive response reflects a growing awareness of functional food concepts and highlights the relevance of corn silk utilization in community-based food innovation.

The training phase continued with a practical demonstration of corn silk tea production. Participants were divided into small groups to ensure that all individuals were directly involved in each processing stage. This hands-on training approach proved effective in improving technical understanding and enhancing participants' confidence to independently produce corn silk tea. Similar participatory training models have been reported to significantly improve skill acquisition and technology adoption in community empowerment programs.

2. Corn Silk Tea Production Procedure

The production process of corn silk tea consisted of several sequential stages, including raw material collection, sorting, washing, withering, size reduction, drying, and packaging into tea bags.

2.1 Raw Material Collection

Corn silk tea production began with the collection of corn silk waste sourced from the surrounding area of the foundation. The raw materials were obtained from fresh corn plants and were free from chemical residues. The use of fresh materials is critical, as bioactive compounds in corn silk are highly susceptible to oxidation and degradation during extended storage, which can significantly diminish their therapeutic efficacy (Arya et al., 2023; Y. Wang et al., 2024).

Figure 1. Collection of Corn Silk

2.2 Sorting

Sorting was conducted to remove foreign materials, dirt, and damaged corn silk, ensuring that only clean and suitable raw materials were used. This step is critical for achieving hygienic quality standards in functional tea products and minimizing contamination risks (Akbar et al., 2019).

2.3 Washing

Sorted corn silk was washed thoroughly to remove adhering dust and impurities. However, washing duration was carefully controlled to prevent degradation or leaching of active compounds. Prolonged washing has been reported to significantly affect the quality and bioactive content of agricultural products. For example, extended washing time and higher water temperatures in Panax notoginseng resulted in increased losses of saponins, despite reducing heavy metal contamination (Ye et al., 2018). After washing, the corn silk was drained in designated containers until excess water was completely removed.

Figure 2. Washing of Corn Silk

2.4 Withering

Withering was performed to reduce moisture content while minimizing oxidative reactions. Corn silk was either air-dried in a well-ventilated room or lightly drained at ambient temperature for 24 hours. Proper withering was characterized by a pliable texture, intact structure when held, and the emergence of a distinctive aroma without excessive drying (Koloay, 2015).

Figure 3. Withering of Corn Silk

2.5 Size Reduction

Size reduction was conducted using scissors to increase the surface area of the material, thereby facilitating faster moisture loss during drying. This process also aimed to obtain a finer particle size, enabling more efficient extraction of corn silk compounds during brewing.

Figure 4. Size Reduction of Corn Silk

2.6 Drying

Drying serves as a fundamental post-harvest preservation technique aimed at reducing moisture content to levels that inhibit microbial proliferation and enzymatic degradation, where recent evidence indicates that the selection of drying methods and their specific parameters are critical, as they directly determine the retention of bioactive compounds and the resulting biological activity of the herbal infusion (Chua et al., 2019). Studies on tea processing indicate that appropriate moisture reduction during withering and drying can significantly influence chemical composition and sensory quality (CHEN et al., 2012).

In this activity, drying was performed using a conventional sun-drying method, where corn silk was exposed to direct sunlight for three days. Hygiene was maintained by placing the material on elevated trays, protected from pollution sources and animal disturbance. Successful drying was indicated by a brighter color, light texture, and ease of dispersion.

Figure 5. Sun Drying of Corn Silk

2.7 Packaging into Tea Bags

Fully dried corn silk was packaged into tea bags to facilitate brewing and prevent direct mixing with the infusion water. Each tea bag contained approximately one teaspoon of dried corn silk.

Figure 6. Filling of Corn Silk into Tea Bags

3. Brewing Demonstration and Organoleptic Evaluation

A brewing demonstration was conducted using warm water, with one tea bag infused in a single glass. Organoleptic evaluation involved 20 panelists comprising students, teachers, and community cadres. A simple hedonic test was applied to assess color, aroma, and taste. The results indicated that:

- Color: The tea produced a bright brown color, considered appealing by 80% of panelists.
- Aroma: A mild herbal aroma was perceived as pleasant and non-pungent by 75% of panelists.
- Taste: Approximately 70% of panelists reported that the tea had an acceptable flavor without an unpleasant aftertaste.

These findings suggest that corn silk tea possesses sensory characteristics that are generally acceptable to the majority of consumers within the community context.

4. Environmental Impact and Food Literacy Improvement

The activity contributed positively to reducing organic waste within the foundation environment. Corn silk, previously discarded as agricultural waste, was successfully transformed into a value-added herbal beverage. Moreover, the program enhanced participants' literacy regarding functional foods, particularly those derived from locally available plant resources.

Overall, the activity effectively increased participants' awareness of sustainable food waste utilization while introducing basic entrepreneurial concepts. This aligns with the objectives of

community empowerment through food-based innovation and supports the integration of functional food literacy into grassroots-level education.

Conclusion

The socialization and training program on the utilization of corn silk at the Alaurodussalafiyah Foundation successfully enhanced participants' literacy regarding functional foods and the valorization of organic agricultural waste. Participants demonstrated the ability to independently apply proper techniques in producing corn silk tea using simple and locally accessible processing methods.

Furthermore, the resulting corn silk tea exhibited a favorable level of sensory acceptance among participants, indicating its potential for regular consumption and further development. These findings suggest that corn silk tea production can serve not only as an educational tool for functional food awareness but also as a viable foundation for small-scale entrepreneurial initiatives within the foundation environment.

Recommendations

For future development and sustainability of the program, several follow-up actions are recommended:

- Conduct shelf-life and product stability analyses to ensure safety and quality during storage.
- Perform basic chemical quality assessments, including moisture content and antioxidant activity.
- Provide continued assistance in packaging design and advanced entrepreneurship training to improve product marketability.
- Facilitate product registration in accordance with household-scale food safety regulations to support legal commercialization.

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