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Extension Design for Making Jackfruit Banana Flour Cookies in Tambaksari Village, Purwodadi Sub-District, Pasuruan District

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Abstract. *Jackfruit banana in Tambaksari Village is the dominant variety with a high yield productivity of 4 tons/ha. However, the utilization of these bananas is not optimal, so an innovation was developed to utilize raw jackfruit banana fruit into jackfruit banana flour to be processed into cookies. This study aims to design extension services, analyze the increase in knowledge, and determine the level of skills and attitudes of 15 members of Women Farmers Group Sri Rejeki regarding the making of jackfruit banana flour cookies in Tambaksari Village, Purwodadi District, Pasuruan Regency from February to April 2024. The research method used a qualitative approach with a Level III action research method. The process of implementing Extension includes the stages of planning, action, observation, and reflection. Based on observations and interviews, there are significant changes in behavior supported by simple quantitative data from the results of the first evaluation, which shows an increase in knowledge from the value of increasing knowledge percentage of 59%, the level of attitude with a percentage value of 85% (responsible category), and the level of skills getting 12 skilled people. The second evaluation shows the value of increasing knowledge percentage of 60%, the level of attitude with a percentage value of 86% (responsible category), and the level of skills getting 10 skilled people. The conclusion of this research is that this extension is effective in increasing the knowledge, skill level, and attitude level of Women Farmers Group members in making jackfruit banana flour cookies.*

Keywords: *Behavior change, Extension, Jackfruit Banana Flour Cookies*

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INTRODUCTION

Administratively, Tambaksari Village has an area of plantation/forest reaching 422 ha and forest reaching 250 ha compared to the yard area of only 200 ha. This shows that most of the land is still dominated by agriculture. Tambaksari Village is known as the largest banana-producing center, with the productivity of banana plants harvested at 4 tons/ha. Banana plants in Tambaksari Village have a variety of varieties, one of which is the jackfruit banana. (Tambaksari Village Program, 2023).

Jackfruit banana is a plant that has a sweet taste, like bananas in general. Jackfruit banana itself is characterized by green skin, a fragrant aroma, and a size that is almost similar to ambon banana, but jackfruit banana will remain green even though it is mature. Jackfruit bananas in Tambaksari Village are the most common variety, resulting in high productivity.

High productivity is a problem that occurs, one of which is that the selling price of bananas also decreases because many farmers cultivate banana plants in Tambaksari Village. It is necessary to process the results in order to avoid damage to the fruit. The banana fruit itself can be processed into various preparations such as noodles, porridge, cakes, bread, bananas, and banana chips.

Based on the results of interviews with farmers, the utilization of banana fruit is not optimal to become one of the processed products that are rich in benefits. The most common banana variety is the jackfruit banana. Jackfruit bananas have a relatively short shelf life and are easily spoiled. This happens because banana fruit has a high respiration rate and ethylene production continues during harvesting, so a good innovation emerged, namely utilizing unripe jackfruit banana fruit into jackfruit banana flour.

Based on the results of the identification of regional potential and the problems faced by farmers in Tambaksari Village, assistance is needed in utilizing bananas in processed food. This is also one of the annual work plans of the Extension Worker in Tambaksari Village. Assistance activities can be done by Extension to change the behavior of farmers. In this regard, it is necessary to prepare an extension design on "Making Cookies Using Jackfruit Banana Flour."

THEORETICAL STUDY

Anggraeni (2019) explained that the jackfruit banana is a horticultural product that quickly deteriorates due to the physiological process of the fruit. Increasing the shelf life and usability of banana fruit requires diversified processing. Jackfruit banana is also a plant originating from the Southeast Asian region, including Indonesia. The spread of banana plants is almost evenly distributed throughout the world, covering tropical and subtropical regions.

Suyanti et al. (2008) found that banana fruit has good nutritional content, such as providing high energy compared to other fruits. The nutritional content and nutrients in jackfruit bananas tend to be the same as those in other banana varieties. Jackfruit bananas contain magnesium, folic acid, potassium, fiber, iron, niacin, riboflavin, manganese, protein, vitamin C, a little vitamin A, and vitamin B6. The nutritional content of jackfruit bananas can help maintain kidney health. In addition, the iron content in jackfruit bananas can help increase blood pressure.

Some research results show that consuming jackfruit banana flour provides health effects, especially those related to non-digestible carbohydrate components such as resistant starch. (Anggraeni, 2019). Jackfruit banana flour can be an added ingredient in making cookies. Basically, the manufacture of cookies uses low-protein wheat flour so that wheat flour can be substituted with jackfruit banana flour as a substitute (Suswati & Kurniawan, 2024).

According to Sugiyono (2015), the action research method is a scientific way to obtain valid data with the aim of discovering, developing, and proving certain knowledge so that it can be used to understand, solve, and anticipate problems. Researchers need an appropriate method because, without an appropriate and clear method, the research will not be carried out as expected.

Evaluation is an activity that determines the relevance, efficiency, effectiveness, and impact of the program in accordance with the desired objectives. (Harahap et al., 2017). Extension evaluation is an activity that aims to assess a situation, symptoms, and activities using a foundation, one of which is knowledge, attitudes, and skills. Bloom's Taxonomy of Cognitive Process Dimensions: The following describes changes in the dimensions of the cognitive process (Nafiati, 2021). Dividing the size of the cognitive process into six categories, namely knowledge, understanding, application, analysis

synthesis, and Evaluation According to Robbins (2000), the skill aspect is divided into four categories: basic literacy skills, technical skills, interpersonal skills, and problem solving. Attitude is the respondent's opinion or statement towards an object. Indirectly, it can be done with questions or statements, then asked for opinions. Gaol (2015) also operationalizes the learning objectives to be achieved in the affective domain, so there are several examples of operational verbs that can be used, namely: accept, respond, appreciate, and be responsible.

RESEARCH METHODS

This research was conducted in Tambaksari Village, Purwodadi District, Pasuruan Regency. The research period starts in February 2024 and ends in April 2024. The method or type of research used is action research, which consists of the planning stage, action stage, observation stage, and reflection stage. Action research is used at level III, where researchers conduct research to find problems, potentials, or initial conditions and then determine or develop actions and test these actions in an effort to solve problems and improve performance. Data collection techniques at the research stage are structured interviews, observation, and documentation. Furthermore, the method of preparing the extension design is adjusted to the characteristics of the target. The technique of determining the sample is saturated, so the extension target is 15 people.

The analysis of extension evaluation data was carried out using quantitative and qualitative methods. Quantitative methods use scoring analysis techniques to determine specific values and can be used to infer the success rate of extension in the form of increasing knowledge and skill level as well as the level of attitude of extension targets. While qualitative methods to describe based on observations from researchers include identifying areas, interviewing targets, and analyzing potential and problems in Tambaksari Village.

RESULTS AND DISCUSSION

Description of Characteristics of Location and Target of Extension

Tambaksari Village is a village that has an area of 623 ha, with most of its area dominated by plantation land and community settlements. On the Tambaksari Village map, there are additional administrations and public facilities to support the village government in carrying out development planning. The following is a picture of the layout of the Tambaksari village area map prepared using the ArcGIS application.

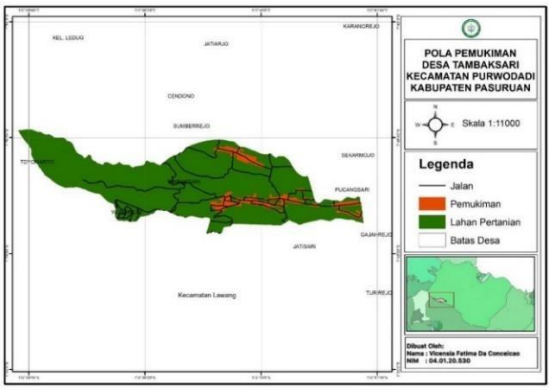


Figure 1. Map of Tambaksari Village

Based on the description above, it is known that the map of Tambaksari Village contains area information, which is in accordance with the geospatial information map found with geospatial information of the area. Forms of information facts include administrative area boundaries, roads, agricultural fields, agricultural gardens, settlements, facilities, and infrastructure. The map provides benefits for the entire community to know the location of each state in the region.

Target Description

The target number reached 15 people, and all of them were used as samples in the study. The following are the characteristics of age, education, and farming experience: The complete data related to the characteristics of the extension targets are as follows:

Table 1. Characteristics and Potential of Extension Targets

Individual characteristics	Category	Number of Individuals	Presentase (%)
Education	SD	4	27
	SMP SMA	8	53
Total		3	20
		15	100
Age (years)	<15	0	0
	15 – 64	13	87
	≥65	2	13
Total		15	100
Farming experience (years)	<10	0	0
	11-20	3	20
	21-30	3	20
	31-40	5	33
	41-50	3	20
Total	>51	1	7
		15	100

Source: Data processed 2024

a. **Characteristics Based on Education Level**

The level of education shows that of the 15 samples of extension targets, the largest number is at the junior high school education level (SMP) as much as 53%. The level of education is very influential on the way of thinking and the ability to reason knowledge so that it can affect a farmer's decision-making. The level of education also affects the stage of application of innovation; the easier it is to absorb the extension material, This is supported by the opinion, according to Seftianingtyas et al. (2022), that there is a relationship between the level of education and the level of knowledge, because it cannot be denied that the higher a person's education, the higher they receive information and knowledge.

b. **Characteristics by Age Level**

Characteristics of Respondents Based on Age: It can be seen that the age of Women Farmers Group members "Sri Rejeki" is in the productive age category. This is because 13 members of Women Farmers Group "Sri Rejeki" are in the productive age category with a percentage of 87% at the age of 15–64 years and non-productive age as many as 2 people at the age of ≥65 years.

c. **Characteristics Based on The Length of Farming Business**

The majority of the length of the target farming business is 11–20 years, with a total of 3 people and a percentage of 20%. Furthermore, the vulnerable farming business of 21–30 years old amounted to 3 people with a percentage of 20%. Whereas in the category of 31–40 years of farming business, there is a percentage of 33%, namely 5 people. The vulnerable farming age range of 41–50 years amounted to 3 people with a percentage of 20%. Followed by the vulnerable farming business > 51 years is 1 person with a percentage of 7%. It can be seen that members of Women Farmers Group Sri Rejeki have long pursued a specific profession in farming.

1. **Crop Production**

Based on the interviews conducted, it is known that the most commonly cultivated crop in Tambaksari Village is banana. The production of bananas in this village is very large, so the community gets a fairly large profit from the cultivation of banana plants. The high productivity is also due to the fact that the area is located at the foot of Mount Arjuna, so it has fertile soil. The results of this interview are in line with Anggraeni's research (2019), which explains that jackfruit banana is a type of tropical plant that is

easy to grow well even without intensive care. Banana fruit can be consumed directly or processed into various other types of food, adding to its economic value for the community.

2. Types of processed agriculture

Even without intensive care. Banana fruit can be consumed directly or processed into various other types of food, adding to its economic value for the community. Some informants revealed that the harvest was not utilized properly; there were even utilization efforts made but not optimal and had to stop halfway. banana fruit into varied food preparations. The interview results revealed that Women Farmers Group Sri Rejeki Tambaksari Village has a variety of processed foods made from various types of plants in the village. However, the utilization of these processed agricultural products is still not optimal because the community does not know about many new innovations. The main problem that occurs is that the processed products do not have a long shelf life, thus hindering the optimization of the economic benefits of these products. This is also due to the fact that processed products contain a lot of water and have a shelf life that is not long if not put in a protected place, such as not being exposed to direct sunlight. These results are in line with the research of Floros and Gnanasekharan (1993) in Heny (2008), which states that there are six main factors that result in quality deterioration or damage to food products, namely oxygen mass, water vapor, light, microorganisms, compression or slamming, and toxic chemicals or off-flavor.

3. Innovation in making jackfruit banana flour cookies

As stated by several informants above, Women Farmers Group Sri Rejeki still does not know the utilization of jackfruit banana flour well. While efforts to utilize bananas into flour can be a new business and can be developed more widely, The innovation of banana horn flour can be added to cookies that are quite popular with the public. The use of banana flour as a substitute for flour in various processed products can reduce the use of flour, which is increasing every year (Siswanto et al., 2015). So it can be concluded that the use of jackfruit banana flour is also an alternative to the use of wheat flour.

4. Farmer Expectations

They have the same view regarding the hope that it can be a new innovation in this stalled business. In addition, the expectations of these two informants turned out to have a very high desire to participate in the activities that would be held with the theme

presented, namely making cookies from jackfruit banana flour. The respondents' attitudes related to this activity were very positive. The process is understood as the meaning they give as an action in an effort to sustain their farming business. Based on the results of the deepening of material conducted through interviews, several farmers who were selected as informants revealed that their farming experience began when they were still in school, so that it became something that was passed down from generation to generation. This certainly affects their knowledge and skills in running their farming business. Farmers who have experience in agriculture will find it easier to understand and analyze the knowledge needs that will be used to increase their farming income.

Implementation of Extension Design

1. Goal Setting

This extension activity involves members of the Women Farmers Group "Sri Rejeki" Tambaksari Village Purwodadi District Pasuruan Regency as the target of the extension. As for the implementation of Extension, it was carried out in 4 stages, consisting of 3 group meetings and 1 personal visit. The implementation of the extension was carried out in as many as four stages. Selection of members of Women Farmers Group "Sri Rejeki" as the target of Extension because the Women Farmers Group members are engaged in processing, but the implementation of the processing has not been implemented optimally. Determination of the number of targets by using saturated sampling technique or census, namely by involving all Women Farmers Group members who are sampled as targets of extension

2. Extension Materials

The determination of extension materials was adjusted to the characteristics and needs of the extension targets. Extension materials include making jackfruit banana flour and making cookies from jackfruit banana flour. Extension material comes from literature studies and study activities carried out at the PHP Lab in Polbangtan, Malang. The material presented to the target is the best study result based on the organoleptic test results.

3. Extension Method

Determination of extension methods using observation methods, group meetings, and anjangsana. This observation activity includes identification of the area, target interviews, and analyzing the potential and problems in Tambaksari Village. Group meetings were held three times: presentation of material, discussion, practice of making banana flour, and making cookies. The outreach method used was discussion. The method was chosen because the target is included in the productive age category and it is expected to provide a reciprocal relationship between the speaker and the target in the process of implementing an extension based on the material of making jackfruit banana flour cookies.

4. Extension Media

In the media extension activities used, there are 4 types, including leaflets, booklets, videos, Power Point, and real objects. This leaflet medium was chosen based on the characteristics of the Women Farmers Group, namely that the average age of the Women Farmers Group is productive. So that they can understand the writing presented in the leaflet. The next medium used is video. The selection of video media here is to clarify and emphasize the provision of stimulus, from the material of making jackfruit banana flour to making cookies from jackfruit banana flour. In video playback, it is able to provide a clearer picture so that women farmers group Sri Rejeki members are more interested in listening to and understanding the material given to women farmers group members during extension activities. The use of real objects in the form of product samples that have been modified as the second and third extension media so that the target knows more real and direct related to the making of jackfruit banana flour to the making of cookies from jackfruit banana flour produced.

Figure 2. Flour Making Leaflet Jackfruit banana

Figure 3. Leaflet for making Jackfruit Banana Flour Cookies

Figure 4. Booklet

5. Implementation of Extension

Extension was conducted four times, three times using the group meeting method and one stage using the anjangsana method. Extension activities are carried out in turn at the home of each member of the women farmers group, Sri Rejeki. In addition to extension activities, there are also routine arisan activities carried out by women farmers group members twice a month. Extension activities can be carried out well because the target has enthusiasm for the material used. In addition to presenting the material, the target participated in making banana flour to be used as processed cookies.

Figure 5. Group Extension

Figure 6. Personal visit extension

6. Evaluation of Extension Results

a. Evaluation of Jackfruit Banana Flour Making

Knowledge Aspect

Evaluation of the knowledge aspect of the extension target was carried out using scoring analysis using a multiple choice type questionnaire. If the respondent's answer choice is correct, it gets a value of 10, and if the respondent's answer choice is wrong, it gets a value of 0. The results of the tabulation of knowledge aspect evaluation data according to the average value:

Table 2. Knowledge aspects of jackfruit banana flour

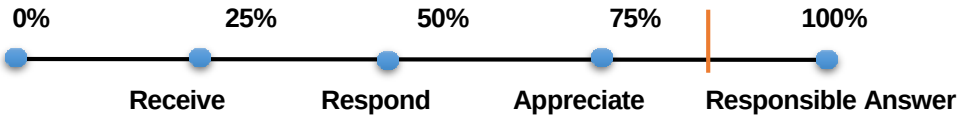
Knowledge Aspect	Average value
Pre-Test	28,6
Post-Test	76,6

Source: Data processed 2024

Based on table 2, it is known that it is distributed based on the results of the t-test on SPSS that the evaluation of knowledge with the aim of knowing the increase in knowledge of the target of Extension, namely members of women farmers group Sri Rejeki with a total of 15 people and are participants who are present in the implementation of Extension activities regarding the making of jackfruit banana flour reaches 59%. Based on the percentage values obtained, it can be seen that the effectiveness of extension evaluation activities in increasing knowledge about making jackfruit banana flour has been proven. This evaluation shows an increase in participants' understanding after attending the extension, indicating that the activity succeeded in achieving its goal of educating the community about the process of making jackfruit banana flour.

Attitude Aspect

Evaluation of the attitude toward making jackfruit banana flour was carried out at the end of the 3rd extension activity using a Likert scale filled in by the target during the extension activity. The following scoring analysis results are used to measure the level of attitude of the target by summing the answer scores:



Based on the results of the evaluation questionnaire, the following is the calculation of the percentage of the attitude aspect: percentage = 707/825 x 100% = 85%. The results of the description show that the level of attitude of the target of extension by answering 11 questions on the questionnaire is included in the category of being responsible for the actions or decisions taken in the process of making jackfruit banana flour.

Skill Aspect

Scoring analysis is used for measuring the target skill level. The scoring analysis of skill level using observations made by researchers is as follows:

Table 3. Skill aspects of jackfruit banana flour

No	Skill Category	Respondents (People)	Presentase (%)
1	Not Skilled Yet	3	20%
2	Skilled	12	80%
	Total	15	100%

Source: Data processed 2024

From the results of the observation checklist, it was found that 12 people were skilled and 3 people were not skilled in making jackfruit banana flour cookies. Several factors cause three members of the farmer women's group to be said to be unskilled in making jackfruit banana flour. This is motivated by a lack of expertise, processing results, and also older age.

b. Evaluation of Making *Cookies Jackfruit Banana* Flour *Starch* Cookies Knowledge Aspect

Evaluation of the knowledge aspect of the extension target was carried out using scoring analysis using a multiple choice type questionnaire. If the respondent's answer choice is correct, it gets a value of 10, and if the respondent's answer choice is wrong, it gets a value of 0. The results of the tabulation of knowledge aspect evaluation data according to the average value:

Table 4. Knowledge aspects of jackfruit banana flour

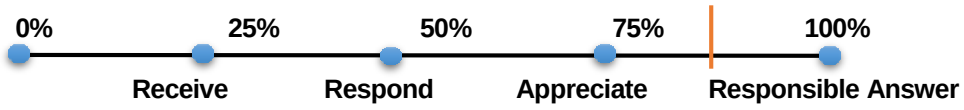
Knowledge Aspect	Average value
Pre-Test	30
Post-Test	80

Source: Data processed 2024

Based on Table 4, it is known that the distribution of t-test results on SPSS shows the evaluation of knowledge with the aim of knowing the increase in knowledge of extension targets, namely members of Women Farmers Group Sri Rejeki. Of the 15 members who attended the implementation of extension activities regarding the making of jackfruit banana flour, 60% showed a significant increase in knowledge.

Attitude Aspect

Evaluation of the attitude toward making jackfruit banana flour cookies was carried out at the end of the 4th extension activity using a Likert scale filled in by the target during the extension activity. The following scoring analysis results are used to measure the level of attitude of the target by summing the answer scores:



Based on the results of the evaluation questionnaire, the following is the calculation of the percentage of the attitude aspect: Percentage = 713/825 x 100% = 86%. The results of the description show that the level of attitude of the target of Extension by answering 11 questions on the questionnaire is included in the category of being responsible for the actions or decisions taken in the process of making jackfruit banana flour cookies.

Skill Aspect

Scoring Analysis is used to measure the skill level of the target. The skill level scoring analysis using observations is :

Table 5. Skill aspects of making jackfruit banana flour cookies

No	Skill Category	Respondents (People)	Presentase (%)
1	Not Skilled Yet	5	33%
2	Skilled	10	67%
	Total	15	100%

Source: Data processed 2024

From the results of the observation checklist, it was found that 10 people were skilled and 5 people were not skilled in making jackfruit banana flour cookies. Several factors cause five members of the farmer women's group to be said to be unskilled in making jackfruit banana flour. This is motivated by a lack of expertise, processing results,

and also older age

CONCLUSIONS AND RECOMMENDATIONS

Extension activities using the action research method proved to be effective as an extension method that includes the stages of planning, action, observation, and reflection of the success of the extension implementation, as reflected in the positive response of the target during the implementation of the extension. Based on the results of the first evaluation, it shows an increase in knowledge from the value of increasing knowledge percentage of 59%, the level of attitude with a percentage value of 85% (responsible category), and the level of skills getting 12 skilled people. The second evaluation shows the value of increasing knowledge percentage of 60%, the level of attitude with a percentage value of 86% (responsible category), and the level of skills getting 10 skilled people.

There is further research related to the utilization of bananas in several new preparations. More and more innovations make more and more enthusiasts, so that the market is easier. It is expected that related agencies, such as extension workers, can provide more innovations to the women farmers group so that they can better understand how to utilize bananas.

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