

## PROCESSING OF STEVIA PLANTS FROM SEEDLINGS TO LOW-CALORIE SUGAR IN KLIRIPAN VILLAGE, HARGOREJO, KOKAP, KULONPROGO

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**Abstract** - Most additional sweeteners are usually made from cane sugar, but excessive sugar consumption can cause health problems. To overcome this, alternative sweeteners such as stevia can be used. Stevia is a plant from the Compositae family that contains stevioside with a sweet taste but few calories. The sweetness level of stevia is much higher than cane sugar and can be a healthier alternative. Stevia plants can be easily grown and provide a low-calorie sugar option that is good for health, especially for individuals who care about their health. Through education and awareness, stevia can help reduce the risk of diseases caused by high-calorie sugar consumption. Therefore, KKN UIN Sunan Kalijaga Yogyakarta Group 28 batch 114 students have conducted socialization of stevia plant processing into low-calorie sugar in Kliripan Hamlet, Hargorejo, Kulonprogo, where the majority of the population is elderly. The aim is to provide an understanding of plant processing and the benefits of sugar from stevia plants and reduce the risk of disease due to the use of high-calorie sugar. This activity includes introducing stevia plants, processing them into liquid sugar, and planting stevia seeds.

**Keywords:** Processing, Stevia, Sugar

## 1. INTRODUCTION

Most food additives that produce a sweet taste are sugar derived from sugar cane. Although only a food additive, sugar is used almost every day, so the human need for sugar is very high. However, excessive sugar consumption can cause health problems such as obesity and diabetes mellitus. To overcome this problem but still be able to meet the need for a sweet taste, an alternative sweetener is needed to replace sugar (Limanto, 2017, p. 2). One of the sugar substitutes that can be used is from the stevia plant. One type of shrub that comes from the Compositae family is stevia. This plant has characteristics including being able to reach a height of about 65 cm, having a round stem, being hairy, having many branches, and being green. Stevia leaves are widely used as an ingredient in making sugar or natural sweeteners. This ingredient is stevioside, a diterpene glycoside that is very sweet but contains almost no calories. Its sweetness level is about 200-300 times sweeter than cane sugar (Dinpertan Pangan, 2022). Stevia has the scientific name *Stevia rebaudiana* Bertoni which originates from Paraguay, South America. The natives of the country use this plant as a sweetener for tea drinks and medicines. Stevia leaves contain stevioside compounds. Among them are stevioside and rebaudioside A (reb A) which have the highest sweetness levels (Ministry of Agriculture of the Republic of Indonesia, 2015). In Indonesia, stevia began to be planted in West Java and Central Java in 1977 (Husni, 2023, p. 44).

Stevia leaves can be used as a natural sweetener product, namely stevia sugar which has lower calories than regular sugar. Sugar from the *Stevia rebaudiana* plant also does not contain carbohydrates, so it is good for diabetics (Fadli, 2022). Stevia can be used as a substitute for sugar for home cooking and various cakes. By using natural ingredients, namely stevia sugar, it is suitable for individuals who care about health, especially for those who are obese and diabetic (Pramudhita, 2024, p. 72).

Stevia plants need to be developed to meet the need for sugar other than white crystal sugar and brown sugar. The way to develop and cultivate this plant can be said to be easy. The most widely used method to propagate stevia seeds is the vegetative cutting technique because it is faster in terms of seed propagation. To do stevia plant cuttings, you can take the stem or the top of the plant. In Kliripan Hamlet, Hargorejo, Kokap, Kulonprogo, Special Region of Yogyakarta, there is a Women Farmers Group (KWT) namely Manunggal Karsa whose activities are planting and processing various plants. The members of this KWT are local women who are members of the PKK, the majority of whom are elderly. In the elderly or elderly, there is a decrease in the sense of taste, smell, hearing, sight, and touch. One of the things that has an effect is a reduction in the sensitivity of taste which is reduced, causing a decrease in taste, one of which is a sweet taste. This makes the elderly enjoy consuming sweet foods and drinks (sugar-sweetened beverages) so that they are at risk of experiencing degenerative diseases such as diabetes mellitus and hypertension (Ramadhani & Mahmudiono, 2018, p. 49).

Because Kliripan Hamlet has a Women Farmers Group (KWT) which is mostly elderly and the use of sugar from stevia is still very rare, this is used as a basis for

conducting socialization of stevia plant processing from seeds to low-calorie sugar in Kliripan Hamlet. This socialization is intended for members of the Women Farmers Group and PKK mothers in Kliripan Hamlet.

## **2. METHOD**

This article explains stevia plant socialization, the process of making stevia sugar in liquid form, and planting stevia seeds. The purpose of this program is to provide an understanding of plant processing and the benefits of sugar from stevia plants and to reduce the risk of disease due to the use of caloric sugar.

### **Location and Participants**

This activity was carried out by KKN UIN Sunan Kalijaga Yogyakarta students, Group 28, batch 144. This activity was carried out on August 7, 2024, at Kliripan Hamlet, Hargorejo, Kokap, Kulonprogo, DIY. The audience for this activity were members of the PKK mothers and the Manunggal Karsa Women's Farmers Group of Kliripan Hamlet. The activities carried out were introducing stevia plants, followed by making stevia sugar in liquid form and planting stevia seeds on the KWT land of Kliripan Hamlet.

### **Tools and Materials**

In the process of making stevia sugar, first, prepare the tools and materials. The tools *used are as follows:*

- Extractor set
- Digital scales
- Measuring cup

*The materials used are:*

- Stevia plants
- Ice cubes
- Dried stevia leaves
- Aquades
- Spirits
- Polybags
- Soil
- Organic fertilizer

## **3. RESULTS AND DISCUSSION**

This activity involved PKK mothers and members of the Manunggal Karsa Women Farmers Group of Kliripan Hamlet as participants in the socialization of stevia plant processing from seeds to low-calorie sugar which was carried out in

Kliripan Hamlet, Hargorejo, Kokap District, Kulon Progo Regency, DIY. The activity was divided into three stages, namely socialization of stevia plants, making stevia sugar, and planting stevia seeds. This activity was attended by 36 participants consisting of members of the Women Farmers Group (KWT) and PKK members of

Kliripan Hamlet. The activity began with an explanation of stevia plants, the planting process, and their processing.

### **Making Organic Fertilizer**

Before the socialization activity was carried out, first the KKN UIN Sunan Kalijaga Yogyakarta students, Group 28, batch 144 made organic fertilizer. Organic fertilizer is made using green leaves, banana stems, and goat manure. The green leaves and banana stems are chopped first to create small leaf and stem sizes so that they can speed up the fermentation process. The chopped leaves and banana stems are mixed with goat manure and stirred evenly. The next process is pouring molasses and M4 evenly accompanied by stirring so that it is mixed evenly. The mixture is then covered and left for approximately one week.



**Figure 1.** Making Organic Fertilizer

### **Stevia Plant Socialization**

The first stage of this series of activities is the socialization of stevia plants. The activities carried out were in the form of counseling and discussions about stevia plants. During the socialization, the mothers listened and paid close attention. They were also enthusiastic about the material explained by the resource person.



**Figure 2.** Socialization of Stevia Plants

### **Making Stevia Sugar Soxhletation Process**

Stevia leaf extraction using the soxhlet method aims to obtain stevia leaf yield. The soxhlet method is an extraction process that uses repeated filtration by heating the solvent until it evaporates and wets the sample. Extraction is done by drying the stevia leaves and grinding them, then putting them into a soxhlet. Then extracted with aquades solvent for 3 cycles and liquid stevia extract. Heating is done with a bunsen heater fueled by *spiritus*.



**Figure 3.** Soxhletation Process

### **Tannin Reduction**

In stevia leaf sweetener, high tannin content is undesirable, because it causes a bitter and slightly unpleasant taste. The tannin content in stevia extract is reduced by using activated carbon. The reduction of tannin content in stevia extract is done by passing the stevia extract in a burette containing activated carbon for 4 cycles.



**Figure 4.** Tannin Reduction Process

### **Planting Stevia Seeds**

Stevia plants with the Latin name *Stevia Rebaudiana* Bertoni are plants with very low to zero calorie content (Purwantoro et al., 2008, pp. 94–98). This plant has low calories which makes it relatively inactive so it can be a way out for someone who avoids sugar, for example for diabetics (Ratnani & Anggraeni, 2005, p. 27).

Stevia seedlings can be planted in several ways, including from seeds, cuttings, shoots, and tissue culture. However, the most widely used is propagation through cuttings because it is faster and more practical. For propagation using cuttings, it is necessary to provide an airtight plastic cover so that the temperature is low and the humidity is close to 100%. After 3-4 weeks, the cuttings can be transplanted into the prepared land (Dinpertan Pangan, 2022).



**Figure 5.** Planting Stevia Seeds

#### 4. CONCLUSION

Most additional sweeteners are made from sugar derived from sugar cane. Excessive sugar consumption can cause health problems such as obesity and diabetes. To overcome this problem and still meet the need for sweetness, alternative sweeteners such as stevia can be used. Stevia, a shrub from the Compositae family, contains stevioside which is a glycoside with a sweet taste with very few calories. Stevia is much sweeter than sugar cane and can be a healthier alternative for individuals who care about their health. Planting stevia plants is relatively easy and can provide a low-calorie sugar alternative. Through awareness and education, the use of stevia can reduce the risk of diseases caused by high-calorie sugars, which is beneficial not only for the elderly but also for the general public. Therefore, KKN UIN Sunan Kalijaga Yogyakarta Group 28 batch 114 students held a socialization of stevia plant processing from seeds to low-calorie sugar in Kliripan Hamlet, Hargorejo, Kulonprogo, where the majority of the population is elderly. This activity is divided into 3 stages, namely introduction to stevia plants, processing of stevia plants into liquid sugar, and the last is planting of stevia seeds.

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