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The Development of a prebiotic probiotic ice cream in Usaha Bersama Tani Ternak joint business group, Tadukan Raga Village, STM Hilir Regency, Deli Serdang County

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ABSTRACT

The focus of the service was teaching at the Usaha Bersama Tani Ternak Joint Business Group, Tadukan Raga Village, STM Hilir District, Deli Serdang Regency. In this group, many dairy goat farmers produce milk. Product innovation from goat milk is needed because, if we rely solely on the basic product — milk — there are limitations for consumers who buy it. In 2023, in the Joint Business group, training was conducted to make ice cream from goat's milk. The innovation of processing milk into ice cream will expand the product's marketing range and increase its shelf life. In 2024, assistance was provided to this group to develop ice cream with prebiotic and probiotic innovations. This is a regular one-year service, carried out in July 2024, and assistance will continue until December 2024. It is hoped that after the service, processing goat's milk into ice cream will be carried out intensively. Given that the air in North Sumatra is getting hotter, ice cream products will be in high demand. In addition, this community service activity also improves the Main Performance Indicators (IKU) of Higher Education, namely IKU 2, 3, and 5. Mandatory outputs of this community service activity program include: 1) Scientific publications in abdimas journals/service journals with ISSN / National Journal Proceedings, 2) videos, and 3) disseminated through electronic/print media. Additional outputs include the production of probiotic prebiootic ice cream and participation in a national seminar, as well as the development of probiotic prebiotic ice cream products in Deli Serdang Regency.

Keyword: Beans, Community service, Ice cream, Prebiotic, Probiotic

ABSTRAK

Fokus pengabdian adalah mengajar di Kelompok Usaha Bersama Tani Ternak, Desa Tadukan Raga, Kecamatan STM Hilir, Kabupaten Deli Serdang. Di kelompok ini terdapat banyak peternak kambing perah yang memproduksi susu. Inovasi produk dari susu kambing sangat dibutuhkan, karena jika hanya mengandalkan produk dasar yaitu susu maka ada keterbatasan konsumen yang membeli. Pada tahun 2023 di kelompok Usaha Bersama dilakukan pelatihan pembuatan es krim dari susu kambing. Inovasi pengolahan susu menjadi es krim akan memperluas jangkauan pemasaran dan meningkatkan daya simpan susu. Pada tahun 2024, pendampingan dilakukan pada kelompok ini dengan tujuan mengembangkan es krim dengan inovasi prebiotik dan probiotik. Pengabdian ini merupakan pengabdian rutin mono tahun dan telah dilaksanakan pada bulan Juli 2024 dan pendampingan akan terus dilakukan hingga Desember 2024. Diharapkan setelah pengabdian ini, pengolahan susu kambing menjadi es krim akan gencar dilakukan. Mengingat saat ini udara di Sumatera Utara semakin panas sehingga produk es krim akan banyak diminati. Selain itu, kegiatan pengabdian kepada masyarakat ini juga meningkatkan Indikator Kinerja Utama (IKU) Perguruan Tinggi yaitu IKU 2, 3 dan 5. Luaran wajib dari program kegiatan pengabdian kepada masyarakat ini antara lain: 1) Publikasi ilmiah pada jurnal

abdimas/jurnal pengabdian yang ber ISSN/Prosiding Jurnal Nasional, 2) video, 3) disebarluaskan melalui media elektronik/cetak. Luaran tambahan adalah produksi produk es krim probiotik dan keikutsertaan dalam seminar nasional 4) pengembangan produk es krim probiotik di Kabupaten Deli Serdang.
Keyword: Es Krim, Kacang, Pengabdian, Prebiotik, Probiotik

1. Introduction

Tani Ternak Joint Business Group, Tadukan Raga Village, STM Hilir District, Deli Serdang Regency, one of its leading commodities is goat milk. There are hundreds of dairy goats from the crossbreed of PE (Peranakan Etawah) goats and Saanen goats. Crossbred goats are called Sapera (Saanen-PE), with milk yield higher than PE but feed consumption lower than PE. Saanen goats are famous for their higher milk yield [1,2].

The Joint Business Group in 2023 received ice cream training assistance from LPPM USU. However, product development efforts are needed to ensure public interest in ice cream remains high. The ideas that emerged from the discussion with the farm became interesting to realize. They hope that the product will increase public interest in goat milk processing.

There is a stigma in the community that goat's milk smells rancid. The rancid smell can be masked, among other methods, by processing milk with added aromas that not only cover the rancid smell but also enhance the taste of the processed milk [3, 4]. Goat milk is the best among all types of milk, such as cow, buffalo, horse, camel milk [5,6]. Therefore, it is unfortunate that people do not take advantage of goat's milk because of its rancid odor.

In 2024, a service was provided to assist in making ice cream variants, namely probiotic ice cream with the addition of prebiotic ingredients, such as beans (green, red, and yellow) [7,8]. Also, probiotic ice cream with the addition of dadih (curd culture) [9,10].

2. Methods

Community service methods include:

a. Participatory training and community empowerment, which was conducted among Taduken Raga dairy goat breeders. According to [11], these methods are pretty effective in raising the potential of rural communities.
b. Participatory Rural Appreciation; all dairy goat breeders are actively involved, while a community service team from Universitas Sumatera Utara acts as facilitators.
c. Comprehensive, namely, the community service process is carried out simultaneously related to human resources and raw materials.
d. Applying affordable technology, which dairy breeders could conduct. Later on, the product of this community service, i.e, dadih, could support their business.

The community service method is implemented in 5 (five) stages, namely:

a. Conducting surveys to determine the conditions or the problems faced by dairy goat breeders and other communities of Tadukan Raga village.
b. Interviews were conducted with dairy goat breeders and other communities to gauge potential and enthusiasm in community service.
c. Introducing a community service program includes the time and schedule, materials, training/demonstrations, and counseling assistance.
d. Program implementation
e. Program monitoring.

3. Results and Discussion

A survey conducted in Tadukan Raga village revealed that quite a number of dairy goat farmers raise around 700 goats, although only around 100 are lactating. The rest are males and calves. Daily milk production is around 100-150 liters. Interviews with farmers were also conducted during the survey. The interviews revealed that the farmers' problem is that they want to expand their product offerings beyond milk, to include processed products that can expand their market. They want assistance with milk processing equipment, such as ice cream. The ice cream to be marketed, in addition to conventional ice cream, is also probiotic ice cream. Probiotic ice cream will be enriched with flavors, but flavors that support probiotics, such as various legumes

namely as green beans, red beans, and yellow beans, which are considered prebiotics. Probiotics are single or mixed cultures of live microorganisms that, when given to humans, will have a good effect because they will suppress the growth of pathogenic bacteria in the human gut. Probiotics are live microorganisms that are beneficial for human gut and digestive health. Some probiotics commonly used in food include Lactobacillus and Bifidobacterium [12, 13].

Goat milk processed into probiotic ice cream with culture from lactic acid bacteria will undergo a modification in its processing, which is very beneficial for public health. The process of making probiotic goat milk ice cream involves adding culture bacteria to a mixture of heated, sugar- and emulsifier-mixed goat milk. Probiotic bacteria can colonize in the gastrointestinal tract and provide positive effects on health by balancing the growth of microorganisms in digestion [14,15].

3.1. Provide lessons on the benefits of dadih and how to make dadih

Dadih is a dairy product made from goat's milk, among other dairy products. The milk is naturally fermented in bamboo tubes at room temperature for 24 to 48 hours. Dadih is the result of the local wisdom of Indonesian ancestors for hundreds of years. The initial purpose was to extend the shelf life of milk, but the pleasure of consuming dadih and its health benefits made it a routine for people in make and consume dadih [16,17].

(a) (b)

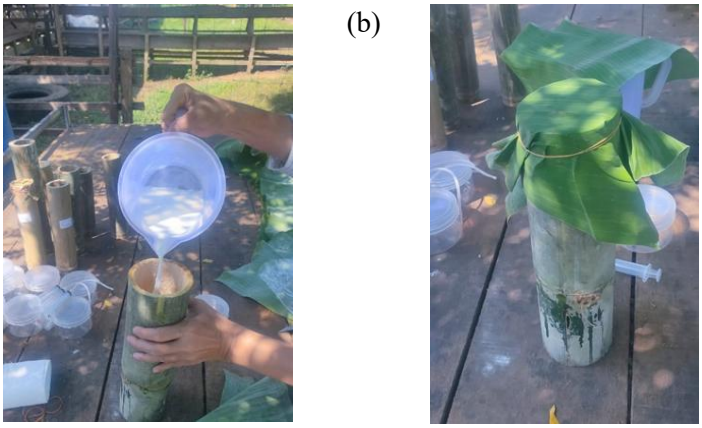

Figure 1. (a) Training on making dadih from goat milk, (b) Bamboo tubes containing fermented milk were covered with banana leaves to prevent oxygen contamination and fermented at room temperature for 48 hours.

Milk fermentation converts lactose in milk into glucose and galactose. Some humans lack the enzyme to digest lactose, while others can digest glucose and galactose. Therefore, humans who are intolerant to fresh milk can digest dadih [18].

Fermentation of milk in bamboo tubes is actively assisted by microorganisms naturally present in the bamboo tubes. These microorganisms are lactic acid bacteria, including the genus Lactobacillus with various species such as Weisella paramesenteroides, Lactobacillus plantarum, or Weisella, which are probiotic. Probiotics are foods that contain beneficial bacteria for human health [19].

In this service assistance, making dadih starts by taking a bamboo stick and cutting it into 20 cm segments. The bamboo chosen is old and clean. Next, the milk is pasteurized and cooled to 28°Celsius. After cooling, the milk was placed in bamboo tubes, covered with banana leaves, and allowed to stand at room temperature for 48 hours. After 48 hours, the milk had coagulated, with a fresh sour aroma. The curd is ready to be mixed as an ice cream ingredient. Actually, Banana leaves are not only useful as a covering. They also contribute lactic acid bacteria, enriching the diversity and population of lactic acid bacteria in dadih.

3.1.1. Prebiotic preparation. Many beans are prebiotics. Prebiotics are foods that support the further development of good microorganisms in the human digestive tract. In addition, beans are high in protein, which is beneficial for supporting human health, especially in growing children. Green beans is rich in nutrients

that are beneficial to the body as it contains protein, fiber, vitamins, and minerals such as folate, magnesium, and iron [20].

In the core devotion, we are taught to process beans. First, the green beans are peeled and soaked for about 3 hours, then steamed. While hot, add sugar. Next, blend it to make it smoother. Green beans are ready to be added to prebiotic ingredients for ice cream. Especially for red beans, the results will be better if soaked overnight. The same goes for yellow beans.

3.2. Provide lessons on ice cream prebiotic - probiotic and how to make ice cream prebiotic - probiotic

In this service, probiotic ice cream is made through the following stages. First, the ice cream ingredients — sugar, goat milk, whole cream, cornstarch, and tapioca flour — are cooked until boiling. This material is allowed to cool, usually taking about 5 hours. If want to speed it up, soak the batter in a pot in cold water. Then add the bean mixture and dadih, mix well, and refrigerate in the freezer section so the dough continues to increase in viscosity. After the dough has hardened, remix the dough until soft and fluffy. The dough is stored in the refrigerator's frozen section for 24 hours, and the ice cream is ready for consumption [21].

The training process took place diligently and orderly. The participants were happy to help with all the training processes and asked many questions. Participants were interested in adding beans, as there are many bean crops in the village. With knowledge of the benefits of adding beans and dadih, participants were eager to provide prebiotic-probiotic ice cream to their families, especially children in the growth phase for intelligence. The mothers were traumatized by the news about stunted children, one of the causes of which is a lack of quality nutrition. The participants' mothers hope to make ice cream or at least become resellers.

4. Conclusions

The training process has been going well. The participants understood and knew how to make probiotic prebiotic ice cream. Participants hope to make ice cream for their families. In addition, they hope to sell the ice cream or become a reseller. They are confident that the ice cream will be in demand because it is delicious and nutritious.

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