Utilization of Tofu Dregs as Goat Fodder and Utilization of Nano Particles for Skin Care Products

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Abstract. The purpose of this community service is to improve the welfare and income of partners through the use of tofu dregs into animal fodder. Then, it will correlate to the quality of milk which produced by the goat. Finally, this goat's milk will be processed through nanoparticles become a moisturizer for skin care. The location of community service is dedicated for small businesses in Lamnyong Village, Kuala Syiah sub-district, Banda Aceh. In this activity, a method was introduced tofu dregs could be used as quality food for goats which effects on goat milk were highly nutritious. In addition, nanoparticle processes will be introduced on the process of goat's milk which can be a moisturizer for skin care. This will be a new product that can be mass produced and marketed by partners and continuous promotion, thus increasing consumer interest in buying, which will increase partner income. The result of this service is the addition of new fodders resulting in better quality milk products, this is evidenced from laboratory results and other results is the creation of a skin care product that functions as a skin moisturizer. Finally, this product can be used to soften the skin and protect the skin from the sun.

1. Introduction

In order to be healthy and good, everyone needs milk as a source of energy. Milk can be easily found in various types and brands in the market. Foods that are circulating in the market usually come from the results of animal husbandry, sheep, goats, etc. and the results of processing agricultural products such as soybeans. Because of different sources, even though it is equally beneficial for the body, each milk produced from milk content is also different.

Today, the milk production process is managed in a traditional and modern way. In modern milk is produced with the help of technology such as the procurement of high-capacity and sophisticated machines. Although it uses many technologies, there are some businesses which still used traditional milk-squeezing to maintain the nature and freshness of the milk.

Utilization of Goat Milk is widely known for maintaining skin beauty and smoothness. Goat milk contains many vitamins, especially vitamins A and D. These vitamins will make the skin soft but strong. Goat milk in this service contains beta hydroxy acid which makes the dead skin cells peel off and replace them with new skin cells so that the new skin is fresher.

George Dermit, a doctor from Ohio University has conducted research and therapy on Goat Milk...
for children with skin diseases. From the results of the study, he concluded that goat milk is very good for sufferers of skin diseases such as eczema, zits, and itching. Moreover, the dermatologists from New Zealand also apply this to any country in the world.

Goat Milk which is rich in natural hydroxy beta acid is now often used as a mixture for scrubs. This mixture not only functions as a peeling that erodes dirt and dead skin cells but is able to brighten the skin to look smoother and not scaly. Additionally, the protein content in milk is also useful as a nutrient supply that functions to moisturize while coating the surface of the skin to make it more smooth and supple.

Besides the benefits of goat's milk, through nanoparticle processes, it can produce skin care moisturizers. This process must use the quality goat milk to produce good and healthy products. This moisturizer is useful for various skin problems.

1.1 Current Conditions and Partners Problem

a. Production Aspect
In the business processing, several obstacles faced by UD. Atjeh Livestock farm in producing milk from the aspect of production, there are:

1) Livestock change because looking for other goats takes a long time and requires a large amount of money. The type of goat that produces quality milk is the result of crossbreed originating from India. This type of goat, it can only be found in Medan and Central Java. It is because of the kingdom in the past, Indian traders came and traded in Indonesia with traders from Batavia, Medan, and Java. They crossbreed their livestock to produce quality milk and there was a crossing which produced a type of crossbreed goat.

2) Quality of human resources in the field of animal husbandry is still limited. Then, the number of workers at the production site is very small. The goat milk business is run by an owner with two workers. However, the milking goat process, there is more labor is needed which is caused business becomes lighter.

3) The amount of production is still limited which make them hard to establish a partnership or become a supplier with other businesses. This causes production to be limited to consumers who only need goat milk to drinks, it cannot reach other aspects such as cheese, yogurt, soap, and so on.

4) Lack of adequate production equipment such as goat milk equipment that uses existing machinery and equipment is limited, such as milk cooking tools that use machines as well, so that group members can more easily produce goat milk, and the value added can be enjoyed by group members.

b. Management Aspect
In business management, the goat milk business group experienced several obstacles, there are:

1) Lack of workers who are experts in their fields in conducting business activities such as feeding and drinking livestock, milking, cleaning cages, and others.

2) Weak in marketing. The lack of market information and skills in marketing products has resulted in the low sales which can be obtained by the goat's milk business, because they market their products without special promotions, only rely on mouth to mouth, a sales system that only relies on customer trust so that one customer will tell the experience of buying products and get health benefits from consuming these products to other prospective customers.

1.2 Problem of Partner

Priority Problem
We draw several priority issues to be resolved so that the goat milk business group becomes more developed in aspects of milk production and business management. Some of the priority issues are:

a. Production Aspect

1) Keep increasing the crossbreed goat quantity to produce quality goat milk.

2) Keep increasing the quality of human resources in the field of animal husbandry and squeezed milk.
3) Keep increasing the production capacity by adding milk machines, to create the faster and more numerous products, and also the profits obtained can increase with the milk produced.

b. Management Aspect
1) Increased number of workers who are skilled in the field of goat farming in managing goat milk business.
2) Increased marketing capacity and capability, in terms of analyzing share expansion and market information.
3) Increased capacity of actors in the business of goats in terms of organization/management.

1.3 Solutions Offered
Regarding the main problems of the partners that have been stated, the solutions offered are:

a. Production Aspect
From the aspect of production, the solutions offered by the Science and Technology program for society include:
1) Increased capacity for the number of crossbreed dairy goats to produce quality goat milk by collaborating with suppliers of dairy goats. Then, when livestock changes it becomes easier.
2) Increased number of qualified human resources in the field of animal husbandry by employing graduates in the field.
3) Increased goat milk production capacity by increasing the number of dairy goats so that they can collaborate or become suppliers with other businesses.
4) Provision of goat milk milking machines to further accelerate production, which is accompanied by a mentoring program to use the tool.
5) Increased product marketing capacity, so partners can market their products with their own brand and packaging and also make consumers find out about these products.

b. Management Aspect
From the management aspect, the solutions offered from science and technology programs for members of this group include:
1) Training in Human Resource Management, which is the improvement of self-development management expertise, which is related to the production process of goat milk.
2) Increased marketing capacity and capabilities, in terms of expanding market share and market information.

2. Methodology
The community services program has been conducted include product creativity and capacity building for partner business organizations. Therefore, the application of science and technology is carried out through a comprehensive and multidisciplinary approach. The program must also involve the perpetrators of the goat milk group as beneficiaries of the program.

The training method is designed using a participatory approach with reference to the adult learning process, through an approach: Presentation of material equipped with PowerPoint Presentation and simulation, Discussion: limited, group, Practice, and Feedback from business actors in the form of understanding the material provided.

Increased production capacity carried out through two fields includes (1) training in marketing goat milk, (2) procurement of dairy machines and other processing equipment, both of which are accompanied by assistance. Mentoring is done by involving parties who are experts in their fields.

To improve capabilities in the marketing field, partners will be given material related to marketing techniques such as determining target consumers, analyzing the market or consumer needs, product marketing through the internet (web), making brand and product logos, as well as market development and breakthrough techniques market.

Development in the field of human resources is held through training and development of workers' expertise, increased collaboration among group members, and strategies for creating a group environment situation to brainstorm or design thinking in a short time, and provide motivation to the goat milk business group to encourage quality dairy products, beneficial to health and have a high
market value.

3. Community Services Result

Processing of Animal Fodder into High Quality of Goat Milk

This community service focuses on how to increase farmers' income with various innovations, especially regarding goat feeding to improve the quality of goat milk so that goat milk produced is of high nutritional value and is favored by the community. There are many things that have been discussed together with farmers. In the discussion, there were still many shortcomings that needed to be addressed. Among other things is equipment that is still very lacking in handling goat's milk. In addition, in this program, it tries to market dairy products to more extensive things, such as online systems. In the following picture, a discussion of the work plan of service and discussion in terms of overcoming the problems that have occurred so far. Discussions with Pak Bambang in terms of this service can be seen in Figure 1 below:

![Figure 1. Road Map of Community Services](image)

Additionally, there are other innovations that devotees try to do, namely by utilizing goat milk into skin moisturizers. Goat milk can be made into a skin moisturizing product through the nanoparticle system. If this product is finished, then this skin moisturizing product can be bought and sold to the public and it can increase farmers' income. However, to produce a good moisturizing product, go through good goat milk. Quality goat milk can be obtained from good goat fodder. Therefore, one of the food sources that must be considered is tofu dregs. It is the best and most nutritious food for goat.

The disadvantage of tofu dregs is that tofu dregs products cannot be stored for a long time, so every purchase of tofu dregs must be calculated when it can run out, so the tofu dregs are not wasted. Tofu dregs are mixed foods where the main food is grass. Mixed foods are very influential on goat's milk resulting from. Therefore, assistance from community service is very helpful for farmers in developing their business. The table below, assistance provided when visiting a goat farm. Giving out the tofu before serving is that they only buy tofu dregs and then give it to the goat. Then, another innovation which can be applied is to provide better quality food. The method used is by the addition of feedings from before. The table below will illustrate the prior fodder of the business, as it showed in the table:

| No | Goat Fodder       |
|----|-------------------|
| 1  | Tofu Dreg         |
| 2  | Sago Dreg         |
| 3  | Rice Bran         |
| 4  | Corn Bran         |
| 5  | Corn Cinder       |
| 6  | Mineral Salt      |
In the implementation of the Grant program, additional food was provided to increase the production and quality of the milk. Giving these foods is mixed with other foods. The types of food additives can be referred in the following table 2:

|    | Additional Fodders of goat livestock |
|----|-------------------------------------|
| 1  | Sago flour  Second Quality           |
| 2  | Coconut Meal                         |

The addition of these foods is based on the high protein from the feed. Sago flour is high in energy so it will increase milk production and viscosity of milk. While coconut meal is high in vegetable protein which it can increase the milk production. The availability and continuity are very good for milk production. The amount of food given per day per goat livestock is:

a. Feed the concentrate of 3% from the weight of livestock life = 0.9 kh/head/day  
b. Forage fermented 10% of livestock weight = 3kg/tail/day

The results obtained after getting additional food from the program, there are as follows:

a. Increasing the amount of goat milk production per day. The previous increase in milk production from 1 liter/head/day to 1.3 liters/head/day.  
b. Increased levels of milk nutrients that are better than before  
c. The weight gain of dairy goats for 1 month averages 0.1 kg/head/day

The comparison of the analysis of milk quality before and after the addition of food is: After doing analysis in the laboratory, the quality of milk after adding the food ingredients is an increase in milk protein levels, milk fat, and milk lactose. Laboratory testing is carried out after 1 month of observation.

The lack of tools in the process of milking and milk production is also very pronounced in this effort, therefore we need the help of machines to launch this business process. The tools that exist before the programs are:

a. Clean water is used to clean the udders of the main livestock  
b. A clean washcloth is used to clean and dry washed udders  
c. Portable milking machine  
d. The power cord as a source of electric current for the appliance  
e. Glass liters are used for milked milk containers  
f. Milking milk storage containers  
g. Milk production logbook  
h. Stationery for recording  
i. Gauze for milk filters  
j. Stainless pan for pasteurization

The equipment available is limited, therefore it needs help to add the tools for the business to smoothen again. The assistance of these tools includes:

a. Portable Milking machine for milking equipment  
b. The CMT tool is used for mastitis disease testing in the main livestock  
c. Milk fat test kits are used to test milk fat levels  
d. The pH meter is used to see the pH of milk  
e. Bio-lactation flour is used for additional milk production minerals in the main livestock  
f. Drums are used to store and ferment tofu dregs mixed with concentrate
The provision of feeding assistance and tools can be seen in figure 2 below:

Figure 2. Provision of dedication assistance

All assistance provided has the goal to the small and medium entrepreneurs in order to get better milk production than before so they can increase their income, it can expand their business and the can add more workers. Other analyzes conducted to see the quality of milk are analyzes of the microbial composition. This analysis has been carried out and is still awaiting laboratory results from BPOM and it is expected that in the near future the results will be obtained. Figure 3 below, is the process of mixing food for dairy goats and the process of milking goats.

Figure 3. Mixing of Tofu Dregs for Fodder of Goat

However, after obtaining good quality goat milk, then this service will also process goat milk into skin moisturizing products for skin health through particle nano processes. The manufacture is carried out in a chemical laboratory to produce good products. In addition, these skin products will be examined by dermatologists and chemists to ensure that the process of converting milk into skin moisturizing products is correct. The skin moisturizing product is expected to be a product that is beneficial for skin farmers and can be marketed to the general public which it can improve the visibility of entrepreneurs.

The Processing of Goat Milk into a Skin Care Product

Hypoallergenic moisturizers (Hypo-Allergenic) are moisturizers that do not contain substances that can cause reactions allergies to the skin. This type of moisturizer is suitable for sensitive skin. Hypoallergenic means "minimizing the appearance of allergies". The term Hypo-Allergenic for skin care products means that the product uses as little as possible raw materials that can cause allergic reactions.

The use of Hypo-Allergenic products does not mean 100% free from allergy risks, but the reactions that occur due to some very sensitive raw materials on the skin can be limited to a minimum level. A product needs to be tested to prove that the product does not cause skin irritation or allergies. Products that have been tested by a dermatologist and proven to not cause skin irritation allergies are called
dermatologist tested products. To produce Hypo-Allergenic products can be done by removing allergens. In addition, the used of natural ingredients that function as an antioxidant and anti-bacterial, anti-inflammatory and others into skin moisturizers can also produce Hypo-Allergenic moisturizers.

CONCLUSION

From the community service program carried out to get a positive response for farmers and hopefully this collaboration can increase knowledge of farmers in continuing to manage goat's milk in accordance with the knowledge obtained from the service system. Then, the skin moisturizing products that are produced can also be produced in large quantities and can be marketed online and also manually. Dairy products produced in this service, become healthier which can increase the purchasing power of other communities. In addition, effective marketing, such as online, can introduce goat's milk products to be better in marketing, so that communities outside Aceh can buy and order online.

The skin care moisturizing products produced are also very helpful to partners in terms of new product introduction. This moisturizing product is much favored by women, especially those whose skin is often exposed to sunlight. So, what exactly is the superiority of goat's milk compared to other milk. Basically, both goat milk, cow's milk, and camel milk are rich in protein, vitamin A, vitamin D, and other minerals. Goat milk has a higher protein and vitamin A content than cow's milk, as well as smaller fat molecules. Goat's milk is also usually richer, making it suitable for pampering the skin like a soap and milk bath product.

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