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THE EFFECT OF EXTRACT AMOUNT OF PINEAPPLE AND HEATING TIME ON THE QUALITY OF GOAT'S MILK

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ABSTRACT

Goat milk is a high source of animal protein and has a chemical composition that is almost the same as breast milk, but many people do not like to consume goat's milk because it has a distinctive aroma from goats, therefore the researchers tried to process goat's milk. into curds, curds are fermented milk products, so that it is preferred by the community and improves the nutritional quality of goat's milk itself. The purpose of this study was to determine the effect of adding pineapple extracts and heating time on the quality of goat's milk curd. This research was conducted using a factorial completely randomized design with a linear model. This research was conducted at the Laboratory of Agricultural Product Technology, Faculty of Agriculture, UISU Medan. The results showed that the addition of 40 ml of pineapple extract produced the highest protein content in goat's milk. The heating time of 15 and 30 minutes produces goat's milk with the highest protein and pH levels and the most preferred taste.

KEYWORDS: Goat milk, curd, fermentation.

INTRODUCTION

Goat milk is a liquid produced by ruminants of the goat species (Caperiane). This animal race started to produce milk from the first lactation period, that is, the goats started to produce milk after giving birth for the first time. Nowadays, the use of goat's milk for medical treatment, health maintenance, and to help cure various types of diseases is starting to be done by many people. In fact, not a few medical circles provide therapy to their patients using goat's milk.[1]

Goat's milk is milk that is most similar to mother's milk in terms of composition, nutrition, and natural chemical properties. This makes goat's milk an ideal food for weaning children. The glycerol ether which is much higher in goat's milk than in cow's milk has also made some doctors recommend it for the nutritional treatment of newborns. Symptoms such as indigestion, vomiting, colic, diarrhea, constipation and respiratory problems can be eliminated when goat milk is given to babies.[2]

Enzymes are non-toxic proteins but are able to accelerate the rate of chemical reactions under mild temperatures and degrees of acidity. Enzymes are the prima donna in industry today and in the future because through their use, energy can be saved. Now enzymes have been widely used in the manufacturing industry, for example in the liquid sugar industry, soy sauce, fat modification, and other industries.

Curd is often traded in the market center of Siborong-borong city with very traditional packaging quality conditions and not good enough because traditional curd sellers market only using basins for hand washing and cans that do not meet packaging hygiene standards. This statement is supported by Gross which states that curd has the potential to be developed as a functional food

source of probiotics which is beneficial for the health of the body in addition to being a source of animal protein.

Fulfillment of milk consumption for the national scale is still far from sufficient or it can be said that it is not evenly distributed due to several factors, including low national milk production and low income of the people which causes inability to buy milk. This statement is also written in Siregar's.[3] thesis which states that socialization in consuming milk among the community is still very low, even though consuming milk is very good for health.

The low consumption of milk in the community is also due to their socio-cultural factors who are not used to drinking milk, besides that 60% of Indonesian people have lactose intolerance (lactose allergies) where the lactose in the body cannot accept the lactose in the body cannot accept milk lactose thus causing digestive disorders.[4]

Although milk is a food ingredient that plays an important role in efforts to overcome food shortages, there are limiting factors in the use of milk, where most adults suffer from lactose intolerance, namely the lack of production of the enzyme lactase in the digestive tract. People who suffer from lactose intolerance are unable to digest lactose from milk and if they consume milk it will result in bloating and diarrhea.[4]

The process of making curd in general, first the freshly milked fresh buffalo milk is filtered to separate the dirt or foreign objects that enter during milking, then put it into the bamboo tube that has been cut (with a length of approximately 5cm each from the bamboo knot). The bamboo used must be fresh or not yet dry, because the results of the research on the inside of the bamboo contain lactic acid bacteria (LAB) which causes buffalo milk to clot into curds. Then the bamboo tube containing buffalo milk is covered with banana leaves or plastic and tied with a rubber band, then the bamboo tube that has been filled with buffalo milk is left in a room that is not exposed to direct sunlight (fermented) for about 2 days or until it becomes thick or clot.[5]

Based on the explanation above, the authors conducted research on "the effect of the amount of pineapple extract and heating time on the quality of goat's milk curd" with the hope of providing information about how to make goat milk curds with good quality, in order to increase the added value of goat milk so that it can increase welfare of goat breeders and encouraging people to be more interested in consuming goat's milk.

MATERIALS AND METHODS

The materials used in this study were goat's milk, salt and pineapple extract. The tools used are a scale, plastic cup, burette, knife, becker glass erlenmeyer, bowl spoon, distilator, hot plate stopwatch, shochlet, filter and blender. The chemicals used in this study were N-Heptan, HCL, NaOH, CuSO4, Metyl Red and Aquades.

The research method used was factorial CRD (completely randomized design), which consisted of two factors, namely: Factor 1: Pineapple extract (E) consisting of 3 levels: E1 = 20 ml, E2 = 30 ml, E3 = 40 ml. Second factor: heating time (F) which consists of 4 levels: F1 = 15 minutes, F2 = 30 minutes, F3 = 45 minutes, F4 = 60 minutes. The number of treatment combinations was 3 x 4 = 12, so experimental replications (n) were rounded to 3 times.

Research Implementation

Prepare goat's milk, pineapples, scales, measuring cups, stove and stopwatch beforehand. Take pineapple extract by means of pineapple fruit - peeled - blended - squeezed - filtered. Then the freshly milked fresh goat's milk is filtered first to separate the dirt or foreign objects contained in the milk, then the filtered milk is pasteurized, then the pasteurized milk is given pineapple extract according to the treatment and as much as (1- 1) 5%) then heating with a temperature of 40 ° C for a specified time according to the treatment after that there will be a separation of the whey from the water then the curd is packed using a plastic cup and put in the refrigerator to extend the curd holding time.

Observation and Data Analysis

Observation and analysis of parameters include protein content, fat content, Ph, and organoleptic taste, color, aroma, texture.

Protein Content

Protein determination using the Kjeldajl macro method. Take 1 gram of sample, then put it in a Kjeldahl flask, then add 7.5 grams of CuSO4, 7.5 grams of K2SO4 and 15 ml of concentrated H2SO4. Then boil it until it is clear and heating is continued for 1 hour, then cooled and after it cools down, 100 ml of distilled water and 50% NaOH are added as much as 50 ml. Then the distillation is carried out, the distillate is stored as much as 75 ml in the erlemeyer which has been carried out filled with 50 ml of 0.01 N HCl solution and 5 drops of methyl red indicator, then the distillate is titrated with 0.01 N NaOH to form a yellow color. Blanks were also made by replacing the material with distilled water.[6]

$$\% N = \frac{\text{Titration (Blank - Example)}}{\text{Sample Weight x 10}} \text{ x N.NaOH x 14,008}$$

% Protein = % (N) Nitrogen x Convention Factor
Convention Factor = 6.25

Fat Content

Fat content was determined using the Soxhlet method. The ingredients are weighed as much as 2 grams, then put into the thimble. Installed the extraction tube in the Soxhlet distillation tool with enough petroleum ether

solvent for 4 hours. After the residue in the extraction tube was stirred, extraction was continued for another 2 hours with the same solvent. Petroleum ether containing the extracts of fats and oils is transferred to a clean weigh bottle and its weight is known and then evaporated in a water bath until it is slightly thick. Then dried in an oven at 100 ° C for 1 hour. The residual weight in weigh bottles is expressed as the weight of fat/oil.[6]

$$\text{Fat Content (\%)} = \frac{\text{Fat Weight}}{\text{Sample weight}} \times 100\%$$

pH

pH is defined as minus the logarithm of hydrogen ion activity in an aqueous solution. pH is a dimensionless quantity. The pH was obtained by taking 10 grams of curd and put into a beaker glass and adding distilled water with a ratio of 1: 10. Then stirred for 10 minutes. Then put it into the pH cathode into the beaker glass and wait a while. Then the reading of the pH number is recorded.[6]

Organoleptic Flavor

The organoleptic flavor test was determined by 10 panelists by tasting the coded curd beforehand. The assessment is based on an assessment of the hedonic scale and numeric scale, this can be seen in the following table:

Hedonik Scale	Numeric Scale
Really like	4
Like it	3
Somewhat like	2
Do not like	1

Source:[7]

Organoleptic Color

The organoleptic color test was determined by 10 panelists by looking at the color of the curd that had been coded first. The assessment is based on an assessment of the hedonic scale and numeric scale, this can be seen in the following table:

Hedonik Scale	Numeric Scale
Very white	4
White	3
A little white	2
Not white	1

Source:[7]

Organoleptic Aroma

The organoleptic aroma test was determined by 10 panelists by smelling the aroma of curd that had been coded beforehand. The assessment is based on the hedonic scale and numeric scale assessment, this can be seen in the following table:

Hedonik Scale	Numeric Scale
Very sharp	4
Sharp	3
Kind of sharp	2
Not sharp	1

Source:[7]

Texture (Hardness)

The organoleptic texture test was determined by presenting it to 10 panelists based on the hedonic scale and numerical scale, this can be seen in the following table:

Hedonik Scale	Numeric Scale
Very Chewy	4
Chewy	3
Rather Chewy	2
Not Chewy	1

Source[7]

RESULTS AND DISCUSSION

From the results of the research and statistical tests carried out, it generally shows that the amount of pineapple extract has an effect on the observed parameters (Table 1).

Table 1: The effect of the amount of pineapple extract on the observed parameters.

Pineapple Extract (E)	Protein (%)	Fat (%)	pH	Texture	Color	Flavor	Aroma
E_1 = 20 ml	6.944c	9.237	4.948	2.204	2.650	3.092	2.583
E_2 = 30 ml	7.320b	9.282	4.750	2.305	2.617	3.040	2.558
E_3 = 40 ml	7.626a	9.306	4.530	2.433	2.608	3.017	2.525

Note: Numbers followed by different letters in the same column are significantly different at the 5% level based on the LSD test

Table 1 shows that the amount of pineapple given in goat milk has a significant effect on the protein content of goat milk. In line with the research results of Wahyuningsih et al.[8] who showed that the higher the amount of pineapple extract added would produce milk with the highest protein content. Likewise the results of research by Nugroho and Hayati,[9] which showed that the use of fruit extracts could increase the protein content in milk by 18.6%.

Table 2: The effect of heating time on the observed parameters.

Heating time (F)	Protein (%)	Fat (%)	pH	Texture	Color	Flavor	Aroma
F_1 = 15 minute	7.610a	9.984	5.094a	2.156	2.644	3.167ab	2.578
F_2 = 30 minute	7.434b	9.580	4.853ab	2.289	2.633	3.378a	2.765
F_3 = 45 minute	7.201c	9.147	4.590b	2.361	2.622	2.933b	2.556
F_4 = 60 minute	6.940d	8.388	4.432c	2.450	2.600	2.722c	2.522

Note: Numbers followed by different letters in the same column are significantly different at the 5% level based on the LSD test.

Table 2 shows that the heating time has a significant effect on the protein content, pH and taste of goat milk. The highest protein content and pH of goat's milk were found in the 15 minute heating treatment. This is because the heating time of goat's milk affects the protein content which will cause protein denaturation. According to Buckle et al,[10] milk protein is divided into two groups, namely casein which can be deposited by acids and the enzyme renin and whey protein which can be denatured by heat at a temperature of 65°C. Furthermore, Anggraini et al,[11] stated that the longer the heating time of the milk, the higher the acidity level and the higher the level of proteolitis that occurs so that the protein is dissolved in whey.

Table 2 also shows that goat milk that is most preferred by the panelists is goat's milk with a heating time of 15 and 30 minutes. According to Yulianingsih et al,[12] the sweet taste in milk comes from lactose while the aroma comes from fat. A longer cooking period of 30 minutes will produce milk with a better taste because the longer it is cooked, the more lactose in the milk will be broken down and cause a sweet flavor in the milk.

CONCLUSION

1. Penambahan ekstrak nanas sebanyak 40 ml menghasilkan kandungan protein tertinggi pada susu kambing.
2. Lama pemanasan 15 dan 30 menit menghasilkan susu kambing dengan kadar protein dan pH tertinggi serta rasa yang paling disukai.

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