

The Potential of Natural Stabilizer of Uwi Starch to Improve The Quality of Set Yoghurt Goats Milk during Self Life

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Abstract : Processing goat's milk into yoghurt products can reduce the distinctive aroma of 'prengus' by adding a starter that will break down lactose into lactic acid and switch the milk smell into a distinctive odour of yoghurt. It will also increase the consumption of goat's milk with higher nutritional value and extend the shelf life. This study aims to determine the potential of the natural stabilizer of uwi starch in improving the quality of set yoghurt goat's milk during its shelf-life. This study was conducted in experimental used CRD with four treatments (P1: 0-day storage, P2: 2 days storage, P3: 4 days storage, P4: 6 days storage) and five replications. Analysis of variance used to determine the potential of the natural stabilizer of uwi starch on total lactic acid bacteria, viscosity, and water content set yoghurt goat's milk. And then, Honestly Significant Difference was used to know the difference between the treatments. The results showed that the treatment adding a natural stabilizer of uwi starch was significantly different ($P < 0.05$) in total lactic acid bacteria during storage and had no significant effect ($P > 0.05$) on viscosity and water content during storage.

Keywords: goat milk, uwi starch, yoghurt

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INTRODUCTION

The low consumption of goat's milk in Indonesia is due to the 'goaty' flavour. Processing goat's milk into processed yoghurt products can be an effort to reduce the distinctive goaty flavour because the addition of a starter will break down the lactose into lactic acid and change the smell of milk into a distinct odour of yoghurt. Besides that, it will increase the consumption of goat's milk with higher nutritional value and extend shelf life.

In general, yoghurt is a beverage product or a complement to a dessert dish, typically of a white colour, middle sour flavour, and smooth texture. The viscosity of set yoghurt is one indicator of the quality product that affects the overall appearance and shelf life. In general, set yoghurt often experiences syneresis and decreased viscosity of yoghurt. These events cause the product's low yoghurt viscosity and water content to increase so that it becomes a suitable growth medium for pathogenic bacteria and has a relatively short shelf life.

The addition of a stabilizer can be helpful in a stabilizer in yoghurt set because it can bind water in the product so as minimize syneresis, produce a smooth texture, and increase the shelf life of the product by suppressing the growth of spoilage bacteria. In addition of natural stabilizer starch in yoghurt has been carried out, such as the addition of kimpul starch, has a very significant effect on decreasing syneresis and water content, as well as increasing total acid, viscosity, and water holding capacity (Sari et al., 2019). The use of taro starch as a stabilizer of as much as 2% resulted in the optimal quality of yoghurt in terms of total lactic acid and solid yoghurt (Radang et al., 2021).

Uwi is a local plant that is widely found and consumed by the people of Indonesia. Starch consists of amylose and amylopectin, which is difficult to absorb water and difficult to release water. The starch content in Uwi is relatively high. Uwi starch has an amylose content of 18.41% and amylopectin of 68.57% (Winarti



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and Saputro, 2013), so it is hoped that it can be used as a stabilizer in making goat's milk yoghurt sets and maintaining product quality.

METHODS

The addition of uwi starch to the goat's milk yoghurt set during storage was carried out in August 2022. The ingredients used in making this yoghurt set consist of goat's milk, uwi starch, sugar, and skim milk. Goat's milk yoghurt set with the addition of uwi starch and then stored for six days at 4°C. The study was conducted experimentally in the laboratory using CRD with four treatments (P1 : 0 days storage, P2: 2 days storage, P3: 4 days storage, P4: 6 days storage) and five replications. Analysis of variance used to determine the potential of the natural stabilizer of uwi starch on total lactic acid bacteria, viscosity, and water content set yoghurt goat's milk. And then, Honestly Significant Difference was used to know the difference between the treatments.

Preparation Uwi Strach

Peel the skin of the uwi that will be used and clean them. Then, the uwi is cut into small. Water has been added to the uwi with a 1:1 (w/v) ratio, ground until smooth, filtered and squeezed until the uwi filtrate is obtained. The filtrate obtained was deposited for 72 hours and replaced the water every 24 hours. After setting, the water discarded, and the filtrate was dried under sunlight for 8 hours. After drying, the starch is ground and sieved to obtain uwi starch (Modification by Richana and Sunarti, 2004).

Preparation Set Yogurt Goats Milk

Goat's milk is mixed with 2% uwi starch and stirred until homogeneous. Add 16% (w/v) skim milk and 8% (w/v) sucrose as a sweetener. Place it in a closed glass bottle, heat it at 100°C for 10 minutes, and lower the temperature to 37°C. Starter inoculation is 5% (v/v). The goat's milk will be incubated at 37°C for 16 hours. The incubation was completed by forming a solid coagulant without syneresis with a pH range of 4.2-4.6. Tested the finished yogurt for viscosity, water content, and total lactic acid bacteria (Modification by Bylund, 1995)

RESULTS AND DISCUSSION

The addition of uwi starch to the goat's milk yoghurt set on the total lactic acid bacteria, viscosity, and levels during storage can be seen in Table 1.

Table 1. Total lactic acid bacteria, viscosity, and moisture content of goat's milk yoghurt set with the addition of uwi starch during storage

Parameter	Treatments			
	P ₁	P ₂	P ₃	P ₄
Total LAB (x 10 ⁹ cfu/ml)	3.54 ^a	4.14 ^b	3,54 ^a	3,45 ^a
Viscosity (cP)	160.023 ^a	158.32 ^a	148.03 ^a	144.12 ^a
Water Content (%)	86.16 ^a	86.21 ^a	86.69 ^a	87.04 ^a

Description: Significant superscripts on the same line were significant (P<0.05).

Total Lactic Acid Bacteria

The results showed that the goat's milk yoghurt set with the addition of uwi starch as a stabilizer was significantly different ($P < 0.05$) during the storage period. The highest average LAB was 4.14×10^9 CFU/ml on the second day of storage (P_2), but it decreased by 3.45×10^9 CFU/ml on the sixth day of storage. The decrease in total LAB is thought to be due to the adaptation phase of lactic acid bacteria from the initial incubation temperature to the storage temperature. Bacteria experience stress when environmental conditions are far different from the optimum for their growth which affects their survival (Antonia, 2011). The number of lactic acid bacteria was still high in the goat's milk yoghurt set with the addition of uwi starch during the sixth day storage period (P_4) of 3.45×10^9 CFU/ml. This still meets the total requirement for yoghurt lactic acid bacteria in SNI, which is 10^7 CFU/ml, because generally, lactic acid bacteria also utilize carbohydrates such as glucose, fructose, and sucrose as their energy.

Viscosity

The viscosity of goat's milk set yoghurt with adding uwi starch during storage was 144.12 cP – 160.23 cP. The yoghurt set has a higher viscosity (thick) than the yoghurt drink. The viscosity formation depends on the casein and fat globules in the milk; viscosity can also be caused by adding starch (Sunarlim et al., 2007). The results showed that the viscosity of the yoghurt set with the addition of uwi starch was not significantly different ($P > 0.05$) during the sixth day of storage. This is because adding uwi starch to the goat's milk yoghurt set can maintain product viscosity during the sixth day of storage. The amylopectin content of uwi starch can be used as a stabilizer in goat's milk yoghurt sets, which can bind water to maintain the consistency of yoghurt.

Water Content

The results showed that goat's milk yoghurt set with the addition of uwi starch was not significantly different ($P > 0.05$) in the water content during storage. The water content of the yoghurt set affects the viscosity of the yoghurt. Low water content results in yoghurt with a denser texture. The average water content of goat's milk yoghurt set with the addition of uwi starch during storage ranged from 86.16% - 87.04%. The added starch concentration will affect the amount of water absorbed and bound, so the gel state becomes strong. With the addition of 2% uwi starch, the texture of goat's milk yoghurt becomes thick, and the water content is low. Low water content can suppress the growth of microorganisms, so the product's shelf life is longer. The water content of yoghurt set with the addition of uwi starch during storage (86.16% - 87.04%) can be classified as good even though the water content is not one of the requirements for yoghurt, according to SNI (2009).

CONCLUSION

Based on the research, adding uwi starch to manufacture goat's milk yoghurt sets during storage can maintain the quality of goat's milk yoghurt sets during the sixth day of storage.

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