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Article

Sensory Properties of Yogurt Dairy and Yogurt Goat's with Added Edamame

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Abstract: This study aims to determine the effect of adding edamame on the sensory properties (level of sweetness and aroma of edamame) cow's and goat's milk yogurt. The experiment was carried out using a completely randomized design (CRD) with 5 treatments and 3 replications consisting of, P0 = without the addition of 0% edamame, P1 = the addition of 5% edamame, P2 = the addition of 10% edamame, P3 = the addition of 15% edamame, P4 = 20% edamame addition. The data were analyzed using Analysis of Variance (ANOVA) and continued with Duncan's Multiple Range Test (DMRT) with a level of 5%. The results showed that the addition of edamame to cow's and goat's milk yogurt showed significant differences ($P<0.05$) on the aroma of edamame and the level of sweetness in yogurt. The addition of 5% edamame to cow's and goat's milk yogurt was the lowest average of 2.05-2.01 with the criteria of not smelling of edamame, while the highest average was the addition of 20% edamame, namely 3.35 and 3.36 with the criteria slightly smell of edamame. The lowest average sweetness level for cow's and goat's milk yogurt with the addition of 5% edamame was 2.18 and 1.75 with criteria slightly sweet and not sweet, while the highest average with the addition of 20% edamame was 3.15 and 3.08 with less sweet criteria.

Keywords: cow's milk, goat's milk, edamame, sensory properties.

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1. Introduction

Milk contains various nutrients that are good for the body. The composition of the nutrients contained in milk, namely 87.10% water, 3.90% fat, 3.40% protein, 4.80% lactose and ash 0.72% by [1]. Besides being able to be consumed directly, milk can be processed into yogurt. Yogurt is a fermented milk product that involves metabolizing milk sugar and converting it into lactic acid by [15]. Yogurt is a fermented milk product that uses live and active cultures of Lactobacillus delbrueckii spp. bulgaricus and Streptococcus thermophillus by [3]. Yogurt has the characteristic that it is made by adding lactic acid bacteria to milk. Milk turns like white mush by [2]. According to [6] yogurt is rich in benefits for the body, namely anti-diarrheal, anti-cancer, improving the digestive tract, helping people with lactose intolerance, and regulating cholesterol levels in the blood. The addition of edamame to fermented milk products can increase the nutritional value and improve the taste and texture of yogurt. Yogurt can be made using cow's and goat's milk. However, the receptivity to goat's milk is still low, this is due to the "prengus" aroma (goaty flavor) in goat's milk by [11]. To reduce the fishy smell in cow's milk and also the distinctive smell of goat's milk, you can process it into yogurt. One effort to remove the characteristic odor from milk is by adding edamame to yogurt. Edamame has a distinctive taste and aroma. This low is due to the presence of a "goaty flavor" in goat's milk by [10].

Edamame is an agricultural product known as soy vegetable, which is a Japanese variety of soybean and is grown in Jember and Bogor by [5]. Edamame has a larger pod

shape compared to other soybeans. Edamame has a sweeter taste, softer texture, and is easier to digest by [9]. Edamame functions to increase nutritional value, especially protein, because edamame has a high protein content and is a source of antioxidants by [13]. According to [8], The protein content of edamame reaches 36% and contains nine essential amino acids that the body needs. Edamame is rich in fiber, folic acid, iron, calcium, vitamins C and B, and magnesium. According to [12] stated that edamame contains a phytochemical component consisting of isoflavones (0.1-3%), saponins (0.12-6.6%), and sterols (0.23-0.46%) which are useful as antioxidants. antioxidants. The purpose of this study was to determine the effect of adding edamame on sensory properties (sweetness level and edamame aroma). Cow's milk and goat's milk yogurt with the addition of edamame provides new innovations from yogurt products, food products that have functional value and can increase nutritious food and become processed products. healthy, safe, and halal.

2. Materials and Methods

2.1. Time and Place

This research was conducted in March-May 2022 at the Livestock Production Study Program, Jember State Polytechnic Animal Husbandry Department.

2.2. Tools and Materials

The tools used are thermometers, pans, stirrers, refrigerators, heaters, measuring cups, digital scales, packing bottles, measuring cups, spoons, plastic plates, tissues, juicers, filters, and white cloth.

The materials used in this study were starter cultures of Lactobacillus bulgaricus and Streptococcus thermophillus bacteria from Implementation Technical Livestock breeding unit and Livestock Forage Food (UPT PT and HMT)Batu, fresh SIP cow milk from Polije, Peranakan Etawa (PE) goat milk from smallholder breeders, and edamame from Mitratani 27 in Jember.

2.3. Research Procedure

The second stage is the addition of edamame, before adding the edamame, peel and take the seeds. The research procedure will be carried out in 2 stages, namely:

a. Making Yogurt

The process of making yogurt can be seen in Figure 1.

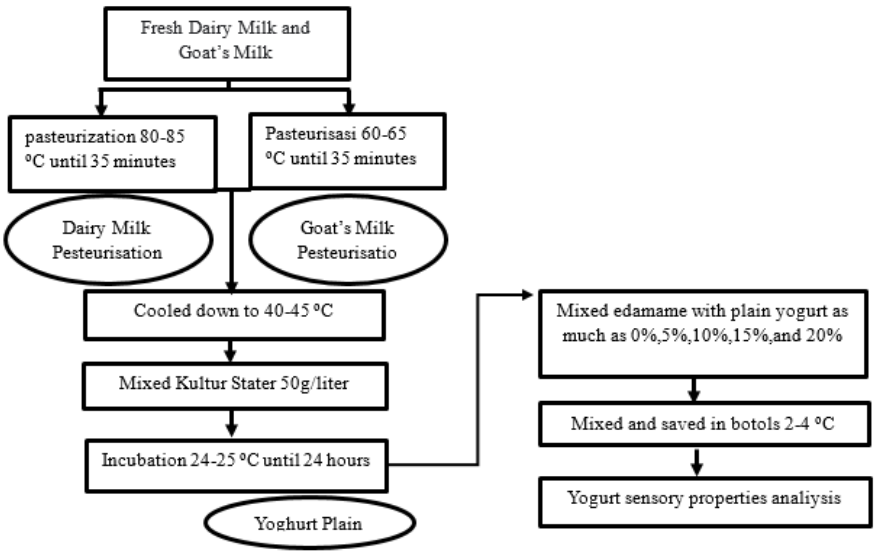

Figure 1. Flowchart of the process of making edamame yogurt

Comparison of making edamame essence, namely as much as 250 grams with the addition of 1 liter of water and then in a blender. After that, the 0edamame pulp is filtered using a white cloth to produce edamame juice. The edamame juice is boiled for 15 minutes at 80oC and then cooled. After chilling, edamame juice can be added to cow's and goat's milk yogurt [13]. Adding edamame to yogurt ,namely 5% (5 ml/100 ml), 10% (10 ml/100 ml), 15% (15 ml/100 ml), and 20% (20 ml / 100 ml).

2.4. Experimental design

The study used a completely randomized design (CRD) with 5 treatments. The treatments applied included, P0 = without 0% edamame addition, P1 = 5% edamame addition, P2 = 10% edamame addition, P3 = 15% edamame addition, and P4 = 20% edamame addition. Each treatment was repeated 3 by [4].

2.5. Sensory Testing

Sensory testing will be carried out by 20 untrained panelists. Panelists will be randomly selected to rate the level the sweetness and aroma of edamame in yogurt with the addition of edamame. The method used in this sensory test is to prepare a sample of 50 ml on a small plate. The test table that has been provided is in the form of a questionnaire form with the aroma of edamame in yogurt with a value range of 1 to 5 with a value as follows:

a) Value 1 = does not smell of edamame at all
b) Value 2 = does not smell of edamame
c) Value 3 = slightly smells of edameme
d) Value 4 = enough to smell of edamame
e) Value 5 = strongly smells of edamame

While Test the level of sweetness in edamame yogurt with a value range of 1 to 5 with a value as follows:

a) Value 1 = very not sweet
b) Value 2 = slightly sweet
c) Value 3 = less sweet
d) Value 4 = sweet
e) Value 5 = very sweet

2.6. Data Analysis

The data were analyzed using the ANOVA Analysis of Variance method to determine the Edamame scent. Based on the average of research on the aroma of edamame in yogurt, the level of edamame can increase the aroma of edamame in yogurt. Ismawati (2016) stated that the aroma of a food product will determine the enjoyment of the food. One of the effect of the treatment on the changes observed at the 5% level and will be continued with the Duncan's Multi Range Test (DMRT) if there is a significant difference.

Duncan's test was carried out to determine the concentration treatment which showed a significant difference. Data was analyzed with the help of a computer program with the SPSS 20 application for windows by [11].

3. Results and Discussion

Functions of the sense of smell is to assess the aroma of a food product. The average aroma of edamame in cow's and goat's milk yogurt can be seen in table 1.

Table 1. Average Edamame Aroma in Dairy Milk and Goat Milk Yogurt

Treatment	Dairy Milk	Goat's Milk
P0	$1{,}37 \pm 0{,}22^{a}$	$1{,}45 \pm 0{,}08^{a}$
P1	$2{,}05 \pm 0{,}21^{b}$	$2{,}01 \pm 0{,}15^{b}$
P2	$2{,}76 \pm 0{,}14^{c}$	$2{,}75 \pm 0{,}13^{c}$
P3	$3{,}15 \pm 0{,}10^{d}$	$3{,}01 \pm 0{,}02^{c}$
P4	$3{,}35 \pm 0{,}05^{d}$	$3{,}36 \pm 0{,}02^{d}$

Note: Different superskip lowercase letters in the mean row indicate a significant difference (P<0.05).

The treatment for yogurt P0 (0%) or the resulting control is very odorless or no smell at all. This is because there is no addition of edamame in the yogurt so that no edamame aroma is emitted. The addition of 5% edamame had the lowest average among the other treatments, namely 2.05 for cow's milk yogurt and 2.01 for goat's milk yogurt with the criteria of not having an edamame smell. While the highest average was the addition of 20% edamame with an average of 3.35 for cow's milk yogurt and 3.36 for goat's milk yogurt with the criteria of slightly edamame odor. According to [7], Edamame has a distinctive aroma and unpleasant odor (beany flavor), and a bitter taste. The unpleasant odor (beany flavor) comes from the oxidation of linolenic acid by the lopoxygenase enzyme, while the bitter taste found in edamame contains the lipoxygenase enzyme itself.

3.1. Sweetsness Level

Table 2. Sweetness level of dairy milk and goat milk yoghurt with added edamame

Treatment	Dairy Milk	Goat's Milk
P0	$1,5 \pm 0,13^{a}$	$1,35 \pm 0,05^{a}$
P1	$2,18 \pm 0,20^{b}$	$1,76 \pm 0,06^{b}$
P2	$2,5 \pm 0,13^{c}$	$2,28 \pm 0,76^{c}$
P3	$2,85 \pm 0,08^{d}$	$2,71 \pm 0,28^{d}$
P4	$3,15 \pm 0,8^{e}$	$3,08 \pm 0,10^{e}$

Note: Different superskip lowercase letters in the mean row indicate a significant difference (P<0.05).

Based on the results of the research that has been done, it was found that the control results had a value of 1.5 for cow's milk yogurt and 1.35 for goat's milk yogurt which had not sweet criteria. The sweetness level of cow's milk yogurt with the addition of 5% and 10% edamame has an average of 2.18 and 2.5 with the criteria slightly sweet, while goat's milk yogurt has an average of 1.76 and 2.28 which be not sweet and slightly sweet criteria. The addition of edamame by 15% and 20% has an average of 2.85 and 3.15 on cow's milk yogurt with criteria slightly sweet and less sweet. Meanwhile, goat's milk yogurt has an average of 2.71 and 3.08 with criteria slightly sweet and less sweet. It can be seen that with the addition of edamame.

4. Conclusions

Based on the results of the research that has been done, it can be concluded that cow's milk and goat's milk yogurt with the addition of edamame has a slightly edamame smell (criteria for not smelling edamame to slightly smelling edamame), with sweetness levels tending to be slightly sweet (criteria not sweet to slightly sweet). This study produced the best treatment that can be used as making cow's milk yogurt and goat's milk with the treatment of adding 20% edamame by producing yogurt products that are quite sweet and have a slight distinctive smell from edamame.

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