

***Dadih* bamboo ampel (*bambusa vulgaris*) and bamboo gombong (*gigantochloa verticilata*) 2 and 3 days fermented : effect on salad dressing hedonic quality**

Nurzainah Ginting *

*Animal Production Program Study, University of Sumatera Utara Jl. Dr. A. Sofian No.3, Padang Bulan, Medan Baru, Kota Medan, Sumatera Utara 20155

E-mail: nurzainah@usu.ac.id

Abstract. The study aims to find time of fermentation of *dadih* and hedonic quality of *dadih* salad dressing. Goat milk was fermented in two kinds of bamboo: bamboo Ampel (*Bambusa vulgaris*) and bamboo Gombong (*Gigantochloa verticilata*) with different days; i.e. 2 and 3 days which will then became *dadih* while the *dadih* then were used as a raw material for making salad dressing. In Indonesia today there is an increasing on vegetable salad demand due to understanding of the benefits of consuming vegetables. One form of vegetable preparation is vegetable salad that is generally used as non local dressings. This research was conducted from April to May 2017 using Factorial Completely Randomized Design with 2 factors; i.e factor 1 (2 and 3 days fermented *dadih*) and factor 2 (bamboo types : bamboo Ampel and bamboo Gombong) with 4 replications. The parameters were flavor, color, aroma and texture (hedonic evaluation) where there were 25 panelists in doing evaluation. The results showed that 2 days fermented in bamboo ampel significantly ($P < 0.05$) were preferred.

Keywords: bamboo ampel, bamboo gombong, *dadih*, salad dressing

1. Introduction

Dadih is a traditional food from West Sumatera, especially in Minangkabau, Indonesia. *Dadih* is a processed product of traditionally fermented milk buffalo, the form of *dadih* is like tofu, soft textured, white color and *dadih* served as a side dish. *Dadih* processing is done traditionally with the basic ingredients of pure milk buffalo that is inserted into the bamboo tube. In West Sumatera, the use of buffalo milk into *dadih* is caused people have buffalo as traditional livestock and instead of consume fresh milk, people also processed it into *dadih*. Buffalo milk contains good nutrition so that eventually people make *dadih* as part of side dishes.

Table 1. Nutritional composition of various types of milk

Composition	Buffalo Milk	Goat Milk
Fat	7,4	3,3
Protein	3,8	3,3
Water	83,1	83-87,5

Source Warner [1]



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Nowadays in North Sumatera people began to process goat milk into *dadih* due to the increasing number of people who keep *Peranakan Etawa* goat. Goat milk processing is also occurred due to the nutrient content in goat's milk which include the presence of antibody so that people assume will be healthier when consuming product related with goat milk. *Etawa* goat milk contains no beta-lactoglobulin, an allergen compound that often triggers reactions such as asthma, ear infections, redness of the skin, and food digestive disorders. *Etawa* goat milk also does not contain agglutinin, which is a compound that makes fat molecules clot like in cow's milk, so that *etawa* goat milk is easily absorbed by the small intestine [2].

Dadih is made in bamboo tube and type of bamboo which is used is bamboo Ampel (*Bambusa vulgaris*). The selection of this type of bamboo by the community is due to the bitter taste of this bamboo that the processed milk will not be contaminated by ants. This bamboo is filled with milk, spontaneously initiates the development of microorganisms while according to Ammermen [3] microorganisms that play a role in the fermentation process is thought to originate from the surface of the inner bamboo tube, the surface of the cover, and from the buffalo milk that is in use. These microorganisms consist of bacteria and yeasts of bacteria around 10^6 - 10^7 and yeasts about 10^5 . In making *dadih*, the bamboo was covered with banana leaves that have been loosened with fire and fastened by rubberband [4]. After 2 or 3 days due to the process of fermentation, milk turns its texture into a soft coag like a young cheese. Making *dadih* by using freshly cut bamboo can produce a unique blend of bamboo aroma and has a thick white color [5]. Bamboo that was used has a diameter of ± 4 -5 cm and cut into ± 15 cm. Milk filled into bamboo as much as ± 250 ml per bamboo [6].

At this time various types of cheese processed into a component in making salad dressing. Increasing public awareness of health leads to increased salad dressing demand in which the salad dressing is added to the selected vegetable mixtures. This type of food is always provided in a banquet at the hotel or at the buffet or at home. Various kinds of salad dressings such as blue cheese, thousand island, barbecue and others are imported products. As for the non-imported salad dressing, they are a kind of franchise and therefore independence in making the salad dressing becomes a challenge. This research was designed to study salad dressing by using *dadih* from goat milk with different days of *dadih* ripening, i.e. 2 dan 3 days ripening.

2. Materials and Methods

This research was conducted in Animal Production Laboratory and in Food Technology Technology Laboratory Department of Food Science and Technology Faculty of Agriculture University of North Sumatera. This research was conducted from April to June 2017. The materials used in this research were fresh goat milk of two types of bamboo namely, bamboo ampel (*Bambusa vulgaris*) and bamboo gombong (*Gigantochloa verticilata*) as a tool for making *dadih*; Banana leaf as end cover on bamboo during fermentation. Panelists as many as 25 people as a tester that were a lecturer of Animal Production Program that were used to consume salad. Research design was Factorial Completely Randomized Design with 2 factors; i.e factor 1 : 2 and 3 days fermented *dadih* and factor 2 : bamboo types : bamboo Ampel (*Gigantochloa verticilata*) and bamboo Gombong (*Gigantochloa verticilata*) with 4 replications. The research parameters included the quality of *dadih* 2 and 3 days fermented and organoleptic test [7] on salad dressing. The parameters observed were flavor, color, aroma and texture. The determination of hedonic quality was tested based on the principle evaluation of the panelists involved which in this research there were 25 panelists. The range of score used in the sensory evaluation of hedonic quality was 1 to 5. Skala 1 = do not like, 2 = somewhat dislike, 3 = neutral, 4 = like, 5 = very like. Panelist were provided by explanation and guidance for hedonic quality tests for flavor, color, aroma and texture.

The research was first conducted by making *dadih* of fermented goat milk on Ampel bamboo (*Bambusa vulgaris*) and bamboo Gombong (*Gigantochloa verticilata*). Each bamboo was taken the day before there fore, bamboo was in fresh condition and filled with 300 ml pasteurized goat milk. Then the bamboo was lid with banana leaves that had been softened by fire first and tied using a rubber band. Further fermented 2 and 3 days. After 2 days, *dadih* was opened, weighed. The volume of whey

also measured and pH data were taken. Similarly, the fermented *dadih* 3 days, carried out the same treatment.

Figure 1. Scheme in making *Dadih* Goat milk

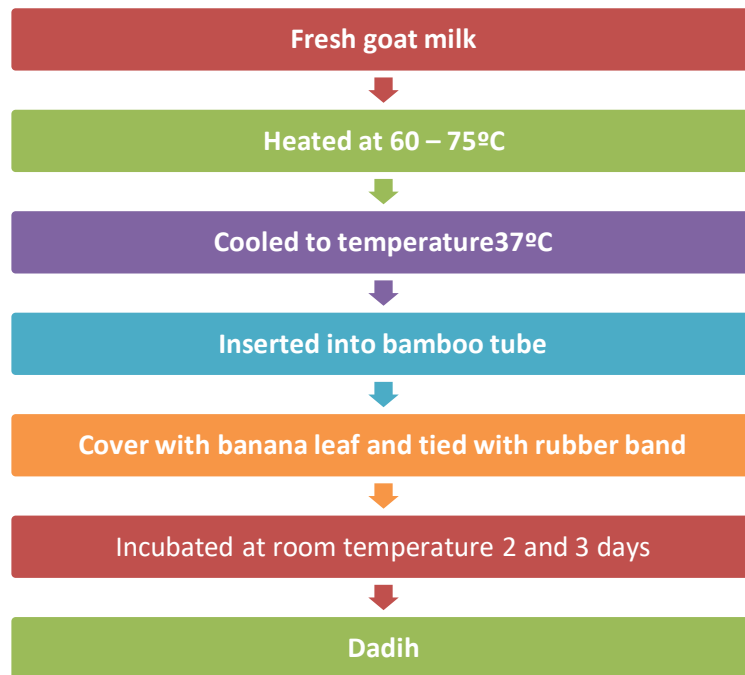
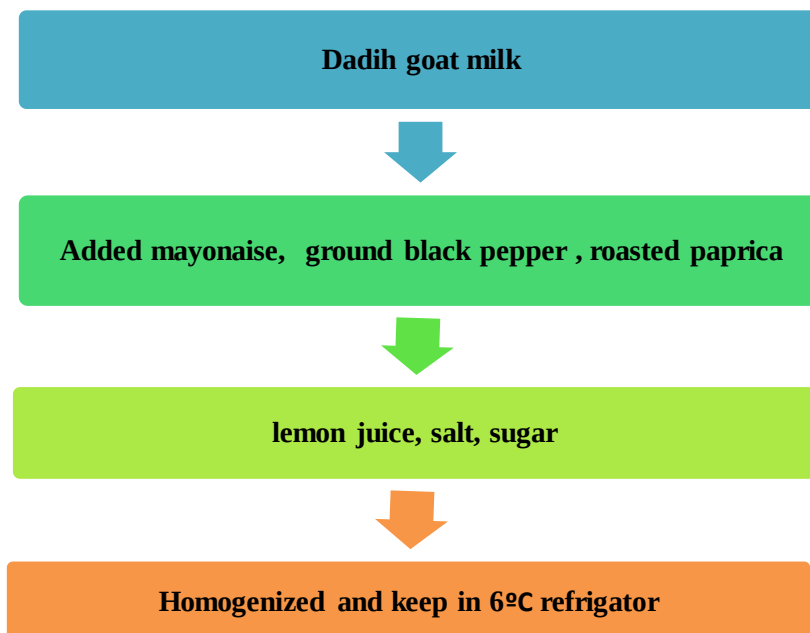


Figure 2. Scheme in Making *Dadih* Salad Dressing



3. Results and Discussion

Dadih that was fermented within 2 days and 3 days produced *dadih* with the approximate weight of 50 g and whey volume about 230 ml. The initial volume of milk used to make yogurt was 300 ml. The occurrence of the difference in volume between the initial milk and *dadih* was due to the water absorbed by the bamboo stems through the pores [8] as well as the metabolism of microorganisms also required water [9]. Taufik [6] stated that lactose and casein were a component of milk that plays a role in milk coagulation. Lactose as a source of carbon and energy was metabolized by bacteria into lactic acid so that the increased acidity of the *dadih* is shown by a decrease in pH. The pH of the *dadih* that was fermented at 2 days on average around 4.592 to 4.649 while Usmiati and Setiyanto [8] found 4.68 to 4.77 with fermentation for 40 hours. Results by Pato [9] showed that there were 36 strains of lactic acid bacteria (BAL) dominant in *dadih* dominated by *Lactobacillus plantarum* Sunarlim et al. [10] reported that benefits of BALs for a lot of health include interfering with pathogenic bacteria, lowering cholesterol, anti-mutagenic, anti-carcinogenic, improving immune system.

Table 2. *Dadih* goat milk fermented within 2 and 3 days

	<i>Dadih</i>					
	2 Days fermentation			3 Days fermentation		
	Weight of <i>Dadih</i> (g)	Volume of Whey (ml)	pH	Weight of <i>Dadih</i> (g)	Volume of Whey (ml)	pH
Bamboo Ampel	50	230	4.592	50	230	4.926
Bamboo Gombong	50	230	4.649	50	230	4.952

The finished *dadih* was then processed into salad dressing with reference to a conventional formula of dressings with ingredients such as raw cheese. Some ingredients added include mayonnaise, lemon, sugar, salt, roasted paprika powder as well as black pepper powder. Then organoleptic test was done to 25 panelists with 3 kinds of salad dressing :commercial dressing containing cheese namely blue cheese salad dressing, dressing bamboo ampel, dressing bamboo gombong.

Table 3. Dressing bluechees, dressing bamboo ampel and bamboo gombong.

Variabel	2 day	Mean±SD	3 day	Mean±SD
Flavour	Dressing Bluecheese	3.26±0.82	Dressing Bluecheese	3.31±0.94
	Dressing Bamboo ampel	4.65±0.42 ^a	Dressing Bamboo ampel	2.25±0.52
	Dressing Bamboo Gombong	4.45±0.47 ^a	Dressing Bamboo Gombong	2.23±0.50
Color	Dressing Bluecheese	3.73±0.68	Dressing Bluecheese	3.83±0.67
	Dressing Bamboo ampel	3.59±0.96	Dressing Bamboo ampel	3.56±0.54
	Dressing Bamboo Gombong	3.59±0.96	Dressing Bamboo Gombong	3.56±0.54
Aroma	Dressing Bluecheese	3.20±0.83	Dressing Bluecheese	3.22±0.82
	Dressing Bamboo ampel	3.35±0.95	Dressing Bamboo ampel	3.23±0.81
	Dressing Bamboo Gombong	3.21±0.80	Dressing Bamboo Gombong	3.28±0.85
Texture	Dressing Bluecheese	4.32±0.50 ^a	Dressing Bluecheese	4.32±0.50 ^a
	Dressing Bamboo ampel	4.20±0.45 ^a	Dressing Bamboo ampel	4.23±0.53 ^a
	Dressing Bamboo Gombong	4.21±0.46 ^a	Dressing Bamboo Gombong	4.22±0.52 ^a

Note: Means in the same column and row with different superscripts differ significantly (P<0.05)

Flavour: 1 = very sour; 2 = sour; 3 = sourish; 4 = tasteless; 5 = very tasteless.

Color: 1 = reddish; 2 = slight reddish; 3 = whitish; 4 = white; 5 = very white.

Aroma: 1 = very rancid; 2 = putrid; 3 = less putrid; 4 = special milk; 5 = not putrid

Texture: 1 = very hard not padded; 2 = hard; 3 = paddish; 4 = soft, padded; 5 = very padded

The results of organoleptic test in Table 3 showed the score from panelist on the flavour of salad dressing. The *dadih* fermented within 2 days was 3.26-4.65 which was perceived as neutral until like where bluecheese dressing was perceived as neutral and *dadih* bamboo ampel dressing and *dadih* bamboo gombong was perceived as like. However, dressing with *dadih* bamboo ampel was preferable as its score was higher than dressing with bamboo gombong. Salad dressing where *dadih* was fermented within 3 days, the score was 2.23-3.31 for salad dressing which was perceived as less on both *dadih* dressing due to sour and bitter flavour. According to Usmiyati and Setiyanto [8] sour flavour occurred due to metabolism intensity of microorganism as the enzim kept metabolized lactoce became lactic acid while bitter flavour cause by contamination from the bamboo.

Traditional *dadih* production involves several kinds of microorganisms such as lactic acid bacteria (BAL), mold and yeast. The presence of yeasts in traditional fermented products can contribute positively during the fermentation process and to the final product such as providing growth factors for lactic acid bacteria and enhancing flavor. In addition secondary metabolites produced by yeasts such as acetate, succinate, propionate, fumarate and pyruvate have a good influence on the flavor of *dadih* [12]. In conclusion, *dadih* which fermented within 2 days caused better salad dressing than fermented within 3 days.

The score from panelist on the color of salad dressing was 3.59-3.73 on 2 days fermentation and 3.56-3.83 for 3 days fermentation which was perceived as neutral. However, the score on bluecheese dressing was slightly better as panelists mentioned that they like it more because its whitish meanwhile *dadih* dressing slightly red due to roasted paprika addition as dressing ingredient.

The score from panelist on the aroma of salad dressing was 3.20-3.35 on 2 days fermentation and 3.22-3.28 for 3 days fermentation which was perceived as neutral. According to panelists, aroma was important to be observed however, flavour was the most important.

The score from panelist on the texture of salad dressing was 4.21-4.32 on 2 days fermentation and 4.22-4.32 for 3 days fermentation which was perceived as neutral. Texture is a palpation or touch-associated sense in this research texture was associated with sense of human tongue papillae. The organoleptic test on salad dressing texture was soft. The soft texture of salad dressing resulted from a high water content. According to Yerlikaya and Karagozlu [12] texture was one of consumer ratings for determining the food product quality and as a direct observable parameter. In terms of salad dressing, panelists preferred more on soft product.

4. Conclusion

In conclusion, panelists prefer salad dressing where ingredients were *dadih* bamboo ampel followed by salad dressing where ingredients were bamboo gombong than blue cheese salad dressing. One of panelist mentioned that salad dressing from *dadih* reminded him of salad dressing in Al Baik restaurant in Arab possibly this related with aroma of *dadih* which made with goat milk. This research could initiated a local salad dressing which ingredient was *dadih* and was perceived by panelists as good as commercial salad dressing.

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