



## **pH, WATER AND FAT CONTENT ANALYSIS OF INTEGRATED FORMULATION OF HERBS AND SPICES IN TYPICAL SIMALUNGUN “TINUKTUK”**

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### **ABSTRACT**

The use of spices and herbs is a functional food product that is believed to be efficacious for health and can increase the body's immunity or is usually called an immunomodulator. Tinuktuk has very good properties for the health of the body. By warming the body and also counteracting free radicals with antioxidant activity. This study aims to determine the optimization of the dose of the main components of red ginger and black pepper to produce Tinuktuk with high nutritional value by preparing with an oven. The process in this method uses the percentage of the ratio variation of 70:30, 60:40, 50:50, 40:60, and 30:70. Then, the quality of the tinuktuk was tested, namely: the pH, moisture and fat content. The oven method showed that the pH values from the ratio of 70:30, 60:40, 50:50, 40:60, and 30:70 were 6.15, 6.25, 6.25, 6.25, 6,3, respectively. Beside, for the water content was 56.61%, 54.68%, 54.065%, 49.395%, 45.265% and fat content was 15.52%, 18.35%, 15.46%, 19.39%, 16.50%.

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### **Introduction**

Indonesia is one of the largest spice and spice producing countries in the world. Some herbal plants belong to the spice group. The use of spices has been widely used, both in the food and health industries. One of the uses of spices and herbs as cooking spices originating from Simalungun Regency, North Sumatra Province is Tinuktuk. Tinuktuk at this time is rather difficult to find and the taste is not liked by the younger generation. (Damanik, 2022)

Since the days of the Simalungun Batak ancestors, Tinuktuk is a spice and herbal condiment that is nutritious for the user

and is quite popular. Tinuktuk itself comes from the word "ti" which means "which", while the word "nuktuk" means "mashed", so the meaning of the word Tinuktuk is mashed. Tinuktuk itself has been around for a long time and is believed to have very good properties for the health of the body. (Saragih, 2016).

One of the ethnic groups that have various traditional medicines in Indonesia is the Simalungun ethnic group. Among the traditional medicine that is still known in Simalungun is tinuktuk. The Simalungun community or ethnicity generally refers to tinuktuk which has spices and herbs such

as: black pepper, red ginger, aromatic ginger, shallots, garlic, candlenut, and salt. The main components in tinuktuk are red ginger and black pepper. The anticancer potential of ginger is well documented and its functional ingredients like gingerols, shogaol, and paradols are the valuable ingredients which can prevent various cancers (Mashhadi, et.al., 2013)

The purpose of preparing tinuktuk by the oven method is to reduce the moisture content of the material to a limit where microorganisms inhibit spoilage and can have a long shelf time (Angga, et al., 2013). Drying using an oven has the advantage that the temperature and heating time can be adjusted compared to the roasting temperature.

Tinuktuk is only used as a side dish to eat which is usually eaten using boiled vegetables. But after knowing that tinuktuk has a good impact on health, tinuktuk has used as a medicine. Because this tinuktuk is believed to have high efficacy and can help heal various internal diseases, especially post-natal recovery and body production.

Tinuktuk is highly nutritious and immunomodulatory which is a local product based on natural resources of spices and herbs in Indonesia. With the difference in the concentration of the main ingredients for making tinuktuk by an oven, it can produce good quality and nutrition so that it is safe, healthy and nutritious for consumption.

## Materials And Methods

### Materials

The tools used in this study include a blender, knife, basin, onion basket, sieve, spoon, mortar and pestle, stapler, scissors, cutting board. The equipment used to carry out the chemical characterization of tinuktuk is an analytical balance, measuring cup, filter paper, oven, desiccator, hot plate, pH meter, fume hood, kjeldahl flask, static, measuring flask, beaker glass, stirring rod, dropper, burette, Erlenmeyer, refrigerator, tongs, watch glass, petri dish, Soxhlet, furnace, bath. The materials used in the study included red ginger, black pepper, onion, garlic,

andaliman, cikala acid, candlenut, kencur, and Himalayan salt. Chemicals : aquadest, H<sub>2</sub>SO<sub>4</sub> (p.a), NaOH, n-Hexsane (p.a), AgNO<sub>3</sub> 0.1N, 5% K<sub>2</sub>Cr<sub>2</sub>O<sub>4</sub> indicator.

### Methods

The research method used is an experimental method with 5 treatment ratios percentage of the main components of red ginger and black pepper 70:30, 60:40, 50:50, 40:60, and 30:70. The first step is to prepare the ingredients needed for the tinuktuk, then do with making the tinuktuk and the proximate test consists of analyzing pH levels, water content and fat content in each treatment.

## Results and Discussion

### Determination of pH Value

Measurement of pH value needs to be done to determine the level of acidity or alkalinity of the product and also its relation to the safety and shelf life of the product. The pH value is an important factor for a food product when it is associated with product quality (Negara, et al., 2016). Lawrie (2003) said that almost all bacteria grow optimally at a pH of around 7.0 and will not grow at a pH below 4.0 or above pH 9.0, but the pH for optimal growth is determined by the work of stimulants from various other variables outside of the acidity factor itself.

**Table 1.** The pH for some composition of Tinuktuk

Ratio (%)	pH
70:30	6,15
60:40	6,25
50:50	6,25
40:60	6,25
30:70	6,30

### Water content

Water content is useful for determining the freshness and durability of foodstuffs and the form of very high water content will result in easy entry of bacteria, yeasts and molds to breed, resulting in changes in food ingredients that can accelerate spoilage (Pratama et al., 2014). ). Water activity is an important factor affecting the

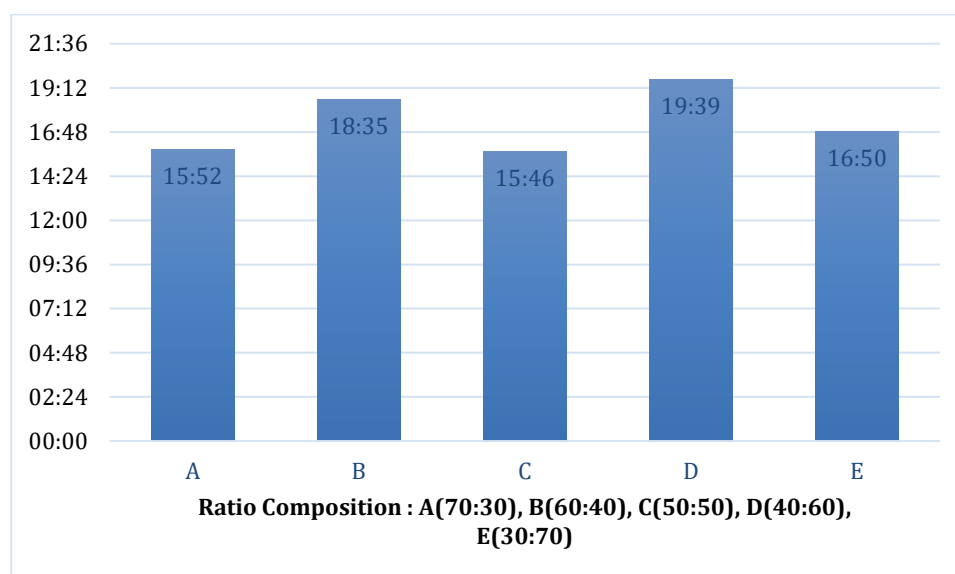
stability of dry food during storage (Gita & Danuji, 2018).

The results of the analysis of water content in Tinuktuk were 70:30%=53.15% ;60:40%=52.89% ;50:50%=43.56% ;40:60=42.94% ;and 30:70%= 41.30%. The water content tends to decrease along with the difference in the concentration of the main components of red ginger and black pepper. The sample with a concentration of 70:30%

had the highest water content because it used a lot of red ginger.

#### *Fat level*

Fat is a substance that is soluble in ether, chloroform (benzene) and insoluble in water. Fat is a more effective source of energy than carbohydrates and protein. In addition, fat also functions as a solvent for vitamins A, D, E and K. Fat is a food reserve in the body, because excess carbohydrates are converted into fat and stored in adipose tissue (Winarno, 2004).



**Figure 1.** Graph The fat content (%)

### **Conclusions**

The conclusion from the results of the research and discussion that has been carried out on the percentage comparisons between 70:30% ;60:40% ;50:50% ;40:60% ;30:70% which has similarities in the results of the analysis with the results of Tinuktuk tambourines that have been marketed are the percentage comparison is 70:30% with three test results, namely the pH value with a value of 6.6, water content is 53.15%, and fat content is 15.52%.

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