

Food Safety and Nutrients of Terites, A Case Study in Kabanjahe, the city of Karo region, Sumatera Utara

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ABSTRACT

Terites is a traditional food of Karo's people in Sumatera Utara which uniquely utilize materials from cow's rumen as a soup. This food is served, especially in the celebrating days, however now days terites is also served at the local restaurants in Kabanjahe, the capital city of Karo region, Sumatera Utara. This study was aimed to investigate the food safety and nutrient contents of terites which served in local restaurants in Kabanjahe. The investigations was using purposive sampling method, the samples were obtained from all of the restaurant which served terites in Kabanjahe and analyze in the laboratory. The results showed that total microbe in the samples was 2.4×10^4 cfu/g , negatively contaminated by *E.coli* and *Salmonella* spp. The data are adequate to the national standard (SNI) for the food safety. The terites contains (average) 19.9% protein, 15.4% fat and 1.68% crude fiber, which adequate as a good nutrient content.

Keywords: *traditional food, terites, pagit-pagit, rumen.*

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INTRODUCTION

Sumatra Utara is a province which located in the Sumatra island in the west of Indonesia. Uniquely the peoples in this province have a traditional food which made from the grass which obtained from the rumen of ruminance, usually a cow. This traditional food is called *Pagit-pagit* or *terites* which usually cooked by the Karo's people in Sumatera Utara for special event like celebrating harvest, wedding or others. For this celebration, peoples of Karo in Sumatera Utara butchering cows for beef, however, they are not only taking meet from the cows but also obtain other parts of cow's body which also can be used as the food. One of it, is the material inside the rumen of the cows. This material is added with water and separated using clean gauze which then added by other ingredients including meat and species, all are boiled become a soup dish called *Pagit-pagit*.

At the beginning time, this traditional food is made only for celebration by the Karo's people in Sumatera Utara, however now days the people in Sumatera Utara can eat this food regularly in the local restaurant. As for the response of this situation, the Karo's people and also the non-Karo's people in Sumatra Utara have different perception for this traditional food. A part of the people have negative opinion since they doubt for the food safety aspect of this traditional food. This consumer have no information about how the materials of this traditional food collected by the producer. The consumer also have no information about the hygiene in the

preparation of this traditional food by the producer. In the traditional condition where *terites* is made, the cow which it's rumen will be taken for *terites* is prepared by feeding the selected grass. As for the *terites* which prepared in the local restaurants, the rumen is bought from the local regular butcher. Those all aspects which then perform the negative opinion for the *terites* which regularly can be consumed in the local restaurant. In this study, the *terites* which served in traditional restaurants were investigated for the safety of the microbes and also to be figured out the nutrient of this traditional food.

METHODS

Design of the research

The object of the research was *terites* which serve in traditional restaurant in Kabanjahe, the city of Karo region in province of Sumatera Utara. There are five traditional restaurants in Kabanjahe which serve *terites* and all of them were selected for sampling. Therefore, the purposive sampling type used in this research was homogeneous sampling (William, 1991). The characteristic of the object which analyze in the laboratory were total microbes, total coliform, total salmonella (Fardiaz, 1993), the contents of protein, fat and crude fiber (Sudarmaji, 1997). The data were described in tables and compare to the standard (Indonesian quality standard).

Sample Preparation

The *terites* which served usually in the traditional restaurant was poured into

a plastic container (Tupperware) and then put into ice box (contain ice cube). All of the samples from five traditional restaurant were treated as this condition and transported to the laboratory. In the laboratory the samples were homogenized using blender (Philips) and use for analysis.

Microbe Analysis Procedure

Total Microbes analysis was carried out using plate count method following the procedure from Fardias, 1993. Prediction test of total coliform was carried out in Lauryl Triptone Broth medium and confirmation test of total coliform was carried out in Brilliant Green Bile Broth (BGBB) medium both were using most propable number (MPN) method following the procedure from Fardias, 1993. The test for Samonella was also carried out following the procedure from Fardias, 1993.

Nutrients Analysis Procedure

The protein content of terites was analysis using macro-Kjeldahl method, following the procedure of Sudarmaji et.al., 1997. Fat content was analysis using Soxhlet which modified for liquid sample, following the procedure of AOAC, 1970. The crude fiber was extracted using acidic and basic compound following the procedure of SNI 01-2891-1992.

RESULT AND DISCUSSION

Total Microbia

The analysis of total microbial at the samples collected from local restaurants

in the city of Kabanjahe is showed in table below (table 1):

Sample No	Total Microbe (cfu/100 ml)	SNI Standard	Note	Reference of the result
1	$3,5 \times 10^4$	$\leq 1 \times 10^5$	adequate	SNI No. 7388 Year 2008
2	$2,3 \times 10^4$	$\leq 1 \times 10^5$	adequate	
3	$1,7 \times 10^4$	$\leq 1 \times 10^5$	adequate	
4	$2,5 \times 10^4$	$\leq 1 \times 10^5$	adequate	
5	$2,3 \times 10^4$	$\leq 1 \times 10^5$	adequate	
Average	$2,4 \times 10^4$			
Deviation std	$5,8 \times 10^3$			

The total microbes in meat and food which processed using heat for animal derivative food product which allowed by Indonesian National Standardization Body year 2009 (SNI No. 7388: 2009) may not break the limitation of 1×10^5 colony per gr. The total plate count, which is showed by all of the samples were not break the limitation allowed. The results are adequate according to Indonesian national standard. This condition indicates that the traditional food terites which served in local restaurants in the city of Kabanjahe is safe from the microbes. The producer showed that they maintain sanitation aspect on the food processing of terites in their restaurant.

Total Coliform

The prediction tests of coliform in the samples collected from local restaurants in the city of Kabanjahe is showed in table below (table 2):

Sample No.	Dilution			MPN/g
	10 ⁻¹	10 ⁻²	10 ⁻³	
1	0	0	0	< 3,0
2	1	1	0	7,4
3	1	2	0	11
4	0	0	0	< 3,0
5	0	0	0	< 3,0

As shown by the table above, two samples which are samples no 2 and 3 have MPN 7,4 per gr and 11 per gr respectively. However, this prediction test was not use for reference that the coliform contain in those samples is pathogenic coliform such as *E.coli*. In the case of coliform contamination in samples no two and three shows that there are microbes which is like coliform grown in the samples. Since generally coliform is not pathogenic, all of the samples were treated with confirmation test for the existence of pathogenic coliform.

The confirmation tests of pathogenic coliform in the samples collected from local restaurants in the city of Kabanjahe is showed in table below (table 3):

Sample No.	Dilution			MPN/g
	10 ⁻¹	10 ⁻²	10 ⁻³	
1	0	0	0	< 3,0
2	0	0	0	< 3,0
3	0	0	0	< 3,0
4	0	0	0	< 3,0
5	0	0	0	< 3,0

As shown by the table, all samples including two samples (no 2 and 3) which showed contamination by coliform in the prediction test previously, show negative result for contamination of pathogenic coliform. The coliform contamination in meat and food

processed using heat for animal derivate food product which regulate by Indonesian National Standardization Body year 2009 (SNI No. 7388: 2009) may not break the limitation of 3,0 colony per gr. According to this national standard, all terites samples adequate for safety of pathogenic coliform, therefore the test for *E.coli* was not proceed further. The result of the test for coliform which shows here is able to confirm that the traditional food terites which served in local restaurants in the city of Kabanjahe is safe from the pathogenic coliform. The producer showed that they keep up sanitation aspect on the food processing of terites in their restaurant.

Total Salmonella

Salmonella is pathogenic bacteria which can contaminate food product and causing diarrhea for the one who consume it. Food may be contaminated during food processing or food handling. Salmonella test for the terites samples collected from local restaurants in the city of Kabanjahe is showed in table 4.

Indonesian National Standardization Body regulate contamination of salmonella especially in meat and food processed using heat for animal derivative food product using the SNI No. 7388:2009. According to this standard, all of the samples are negatively contaminated by Salmonella. The possible contamination point of salmonella for terites served in local restaurant in Kabanjahe span from the butcher to the kitchen of the restaurant. Since the total salmonella test showing

Table 4. Analysis of Total Salmonella in Terites samples Collected from Local Restaurant in Kabanjahe.

Sampel No.	Dilution			SNI Standard	Note	Reference of the result
	10 ⁻¹	10 ⁻²	10 ⁻³			
1	Negative	Negative	Negative	Negative	Adequate	SNI No. 7388 year 2009
2	Negative	Negative	Negative	Negative	Adequate	
3	Negative	Negative	Negative	Negative	Adequate	
4	Negative	Negative	Negative	Negative	Adequate	
5	Negative	Negative	Negative	Negative	Adequate	

negative result for all of the samples indicate the handling of materials from the butcher to the local restaurants is safe from salmonella contamination or the salmonella is able to be eliminated during the handling of materials and food processing.

Nutrient aspect of the terites

The nutrients of terites which analyzed in this study were protein, fat and crude fiber. The nutrient's content are showed in table 5,6 and 7 respectively.

Table 5. Protein contents of terites samples collected from local restaurant in Kabanjahe.

Sample No.	Protein rate	Reference of the Methode
1	6,9 %	SNI No. 2891 year 1992
2	11,8 %	
3	10,9 %	
4	44 %	
5	25,8 %	
average	19,9 %	
Deviation std.	13,6%	

Table 6. Fat contents of terites samples collected from local restaurant in Kabanjahe.

Sample No.	Fat rate	Reference of the Methode
1	8 %	SNI No. 2891 year 1992
2	12 %	
3	22 %	
4	21 %	
5	14 %	
average	15,4 %	
Deviation std.	5,3 %	

Table 7. Protein contents of terites samples collected from local restaurant in Kabanjahe.

Sample No.	Crude Fiber rate	Reference of the Methode
1	1,1 %	SNI No. 2891 year 1992
2	1,7 %	
3	1,4 %	
4	1,8 %	
5	2,4 %	
average	1,68 %	
Deviation std.	0,4 %	

Describing the ingredient of terites, its content meat, vegetable, spices and sauce which obtain from rumen of the cow. All ingredients are boiled and serve as a soup dish. The meat of the terites varies depend on the local restaurant. The producer can use beef, pork, or lamb depend on the price condition at the local market. As for the same kind of meat added into terites among the local restaurants, the size of cut meat also can be varies. The vegetable is usually added into terites. The producer usually add cassava leaves which contain about 4 mg/g protein (Pearson, dkk., 1986) into the terites. The spices which used in terites are salt, onion (red and white), and red chili. The special spices which used in terites are *kecombrang* (*Etlingeraelatior*), *kincung* flower (*Simplisia nicolaia Flos*). Tree bark of *gintung* (*Bischofia javanica* Bl) is also dipped when cooking the terites with aim to drown out the smell of the rumen.

The protein in each terites samples is varies from 6,9% to 44%. The meat and vegetable as mentioned above are all contain protein which resulting in varies protein content of the terites observed in this research. The fat in each of terites sample is varies from 8% to 21%, it varies depend on the local restaurant where the sample was collected. The fat in terites is considered come from the meat which used in this traditional food.

Dietary fiber is a complex mixture of different components, it may or may not include the fibrous structure. Crude fiber, on the other hand, is a term used to describe the fibrous food residue that is left over after it has been dissolved in the

laboratory with certain harsh chemical solvents such as sulfuric acid and sodium hydroxide. Fiber of the food is beneficial for digestion system of the human body. It gives impact to noxious compounds in the body, it affords in preventing constipation and diabetes (Winarno, *et.al.*, 2003). Animal derivative food likes meat, fish, milk, egg and their product are low of fiber contents (Astawan and Andreas, 2008). In terites the crude fiber is come from mostly the vegetable, the others are come from spices which are the plant material and finally come from the meat. The sauce which obtained from rumen of the cow should contain high crude fiber since the cow's feed is grass. However, investigation specifically on this object did not carried out in this study. The crude fiber contents in the terites samples are varies from 1.1% to 2.4%, the differences assume due to the volume and the kind of meat which added into terites by the producer.

CONCLUSION

The terites which are served by the local restaurant in Kabanjahe are safe based on the studied data which showed having total microbe of 2.4×10^4 cfu/g, negative from existence of *E.coli* and *Salmonella* spp, those all data are adequate to national standard.

The nutrients of terites which contain (average) 19.9% protein, 15.4% fat and 1.68% crude fiber are appertained good quality.

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