Analysis Total Microbial And Detection Of Salmonella On Smoked Fish

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Abstract: This study aims to analyze total microbial and detection *Salmonella* on smoked tuna sold in the market arumbae Ambon city. Smoked tuna samples taken from three sellers smoked fish production Aster and two sellers smoked fish products Tantui for sale on the market Arumbae. Analysis Total Plate Count ranged between 4.5 x 10^1 - 9.5 x 10^2 colonies/g. Based SNI.01-2717-1992 quality requirements of smoked fish that maximum is 5 x 10^5 colonies/g, then the smoked fish products sold in the market is still Arumbae determined eligible and suitable for consumption. Analysis of *Salmonella*, the smoked fish sold in the market Arumbae not found *Salmonella*. This is probably due to the fish during the process of curing temperature of heating can inactive *Salmonella*.

Index Terms: Total Plate Count, Salmonella, Smoked Fish

1. INTRODUCTION

Traditionally processed fish products are very susceptible to microbiological damage, which can cause damage to microbiological spoilage of processed products by pathogenic bacteria or fungi, or by toxins produced. One of the traditionally processed fish products smoked tuna are known and loved by all walks of life in the city of Ambon. Smoked fish processing aspects ranging from the handling of raw materials to the distribution of products for sale is still done traditionally so many possibilities of contamination in the resulting product. Smoked fish sold in some markets in Ambon City, comes from some place like Tantui processing, Aster, Galala, Tulehu and Osm. Moeljanto (1982) [1], confirmed that the damage to food depends on the amount of bacteria that initially there, time, sanitation and hygiene actions performed during the handling and preservation. Smoked fish damage can be caused by bacteria or fungi. Anonimous (1982) [2], states that the bacteria that can cause rot or disease usually found in dirty places. Therefore, if the fish are processed are stored in places that are not clean then the chances of transmission of germs in the flesh of fish that can cause disease in humans who eat them. *Salmonella* is a bacteria that causes an infection that is found in foods such as eggs, fish processed chicken meat, beef, milk and processed products such as ice cream and cheese. Furthermore Sikorski *et al*, in Heruwati (2002) [3], states that one of the pathogenic bacterium Salmonella is usually found in smoked fish water level. Types of diseases that can be caused due to the infection salmonellosis and *Salmonella enteric*. Based on the problems above, the author would like to conduct this study to analyze total bacterial and detection of *Salmonella* on smoked tuna sold in the market town of Ambon arumbae.

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2. MATERIAL AND METHODS

Raw materials used in this study is the smoked fish sold in markets Arumbae Ambon, which in the production of of the area Tantui (2 sellers) and Aster (3 sellers). Sample making time for sales (at 15:00 wit). The chemicals used are Sodium Clorida (NaCl), distilled water, PCA (Plate Count Agar), SSA (Salmonella Shigella Agar). The tools used in this study include: Autoclaf, Desiccator Petri dish, Incubators, Analytical Scales, Test tube, Oven, micropipette, stomacher, Bunsen and flasks. The method used in this research is a method of exploratory research is conducted to reveal the description of a particular fact in detail and systematic (Mantrojo and Manus, 1987)[4] and data collected through laboratory tests on existing products. Test parameters in this study include: Analysis of water content, total microbial analysis and analysis of *Salmonella.* Data analysis done in descriptive and the data displayed in the form of Tables and Figures.

Analysis Procedures

Analysis Total Microbial

analysis Total microbial were done according to the method of plate count (Fardiaz, 1993)[5]. Stage Analysis TPC as follows:

1. Weigh 10 g sample is inserted into the plastic and then added 90 ml of 0.9% NaCl solution. Then crushed in a stomacher.
2. Samples were crushed regarded as the first or 10^{-1} dilution.
3. with using a sterile pipette, take 1 ml liquid sample and included in 9 ml of 0.9% NaCl to obtain a 10^{-2} dilution.
4. 2 petridish included sterile 1 ml sample of each dilution, then pour as much as 10 to 15 ml of Plate Count Agar (PCA) with a temperature of 45^0C. then the cup petridish rocked a figure of eight on a flat surface in order to obtain bacterial colonies growing spread. Once in a petri dish that freezes, petridish reversed and incubated for 24-48 hours (2 days) in an incubator with temperature of 35^0C.
5. Colonies of bacteria growing in a petri dish is then calculated with the following calculation formula.

Analysis of *Salmonella* bacteria

Phase Analysis of *Salmonella* (Fardiaz, 1993) [5]:

1. Weigh 10 g sample is inserted into the plastic and then added 90 ml of 0.9% NaCl solution. Then crushed in a stomacher.
2. Fluid samples were pulverized regarded as the first or 10^{-1} dilution.
3. By using a sterile pipette, take 1 ml of sample fluid then entered in 9 ml of 0.9% NaCl to obtain a 10^{-2} dilution.
4. Into 2 bowls included petridish sterile 1 ml sample of each dilution, then pour as much as 10 to 15 ml *Salmonella Shigella Agar* (SSA) with a temperature of 45^0C. then the cup petridish rocked a figure of eight on a flat surface in order to obtain bacterial colonies growing spread. Once in a petri dish that freezes, petridish reversed and incubated for 24-48 hours (2 days) in an incubator with temperature of 35^0C.
5. Colonies of bacteria growing in a petri dish is then calculated.

3. RESULTS AND DISCUSSION

Analysis Total Microbial (TPC)

Analysis total microbial in the sample to determine the microbiological quality of smoked tuna samples. Microbiological quality of a food product need to know to look at the level of microbial contamination in food products, so that can know the security risk if the total consumsi can be used as an indicator of microbial decay as an indicator reflecting the quality and shelf life of food.Microbial contamination of foods can cause chemical changes and cause odor. Microbiological quality of the quantitative analysis results smoked tuna Arumbae taken off the market and are manufactured from Tantui Processing and Aster Place can be seen in Table 1.

Table 1. Total Plate Count on Smoked Tuna

Fish Production	Samples	TPC (colonies /g)
Tantui	A1	$9,2 \times 10^2$
	A2	9.5×10^2
Aster	A3	$1,1 \times 10^3$
	A4	$< 3,0 \times 10^1$ [6,0]$\times 10^1$
	A5	$< 3,0 \times 10^1$ [4.5] $\times 10^1$

TPC test values obtained from fish products Smoke Yield Tantui (A1 and A2) is A1: 9.2×10^2 colonies / gram, A2: 9.5×10^2 colonies / g products while Smoke Fish Production Aster (A3, A4, and A5) is A3: 1.1×10^3 colonies / gram, A4: 6.0×10^1 colonies / gram, and A5: 4.5×10^1. This shows that the total microbial Smoke Fish Production Aster (A3) is higher than Smoke Fish Production results Tantui (A1, A2) and smoked fish products Aster (A4, A5). The high value of TPC on smoke fish products taken off the market Arumbae and produced from the Aster likely due to the condition of sanitation and hygiene Place Fish Processing Smoke is not applied properly, contamination during the sales process as well as the evaporation process is not perfect so can lead to microbial growth.Based SNI.01-2717-1992[6], quality requirements of smoked fish that maximum is 5×10^5 colonies / g, then the smoked fish products sold in the market is still Arumbae determined eligible and worthy of microbes on Plate Count Agar (PCA) can be seen in Figure 1.

Figure 1. Microbial Growth In Plate Count Agar Analysis of *Salmonella* sp.

Salmonella is a bacteria that often contaminate foods such as eggs and meat, fish and meat, chicken, beef, and milk and processed products such as ice cream and cheese (Jay et al.,2005) [7]. Salmonella is a bacterial pathogen that can cause food poisoning. Based on the analysis of Salmonella in SS-Agar media, it is known that the production of smoked fish samples Tantui (A1, A2) and Aster (A3, A4, A5) there is no Salmonella (negative) as displayed in Figure 2.

Figure 2. *Salmonella* (negative) on the SS-Agar

In smoked fish products sold in the market Arumbae not found *Salmonella* bacteria. This is probably due to the fish during the process of curing temperature of heating can inactive *Salmonella*, This is confirmed by Anonimous (2003)[8], that the heating temperature of 66^oC for 20 minutes to destroy or inactive S*almonella*. In addition, the function of the heat coming from fogging expected to reduce spoilage caused by enzymatic processes and microbial activity. Another possibility not encountered *Salmonella* in smoked fish products during the assessment because at the time the assessment has not been terkontminasi product with *Salmonella* bacteria that can be stimulated from the environment point of sale.

4. CONCLUSION

One of microbial contaminants that are found in smoked fish products produced Tantui and daisies are sold in the market Arumbai the mold. Although TPC value is still below the SNI which ranged between 4.5×10^1 to 1.1×10^3 and *Salmonella* (negative) or not found in smoked fish.

5. SUGGESTION

Further research needs to be done to analyze other microbes contained in the smoked fish.

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