

## Existensi of *Salmonella* sp. in Beef Meat in Sangatta, Kutai Timur District

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### Abstract

Based microbiological aspects, product of an animal food safe to be consumption if not contain microbial pathogens, microbial that can cause health problems of humans to whom consume it. One of the pathogenic bacteria that often found on beef is a *salmonella* sp. Research aimed to determine the existence of bacteria *Salmonella* sp. from slaughterhouse, abattoir and traditional market in Sangatta East Kutai regency. Parameter research parameter of observation was to determine whether there are bacteria *Salmonella* sp. (positive / negative) on beef samples and how much percentage (%) the existence of *Salmonella* sp. on beef samples. obtained data for each test were analyzed by descriptive approach. Based on research results on 20 beef samples both from slaughterhouse, abattoir, and sold in Sangatta traditional market not indicate the existence of bacteria *Salmonella* sp. (negative), possibility it is because growth of bacteria *Salmonella* sp. still low and does not have the ability to compete with bacteria lactic acid (*Streptococcus*, *Lactobacillus*, *Aeromonas*, *Acinetobacter*, *Pseudomonas*) so that growth will be obstructed.

**Keywords** : Bacteria, *Salmonella* sp., Beef, Slaughterhouses, Abattoir.

### INTRODUCTION

Many high protein foods are found in meat, and other food ingredients from livestock such as milk and eggs. Meat is an important food in fulfilling nutritional needs. This is in accordance with the opinion of Soeparno (2009) which states that meat is defined as all animal tissues and all products processing tissues that are suitable for consumption and do not cause health problems for those who consume them. Commonly consumed meat can be obtained from large and small ruminants (cows, buffaloes, sheep, goats), poultry (chickens, ducks), and various livestock (rabbits, horses, deer, pigs).

Raw meat often causes foodborne disease or food poisoning if it is contaminated with bacteria and consumed by humans. Generally, foodstuffs such as eggs, meat and dairy products are well known for spreading the infection of this bacterium among human being (Nikbatkh & Sani, 2016). Pathogenic bacteria that usually contaminate meat are *Salmonella* sp.. Handling from slaughterhouses, distribution, traders to the consumers to be processed must be highly considered because unhygienic handling methods will cause the risk of contamination. Reports about the existence of the Sangatta community that has been poisoned by *Salmonella* bacteria have not yet existed, but the risk of the presence of *Salmonella* sp. bacteria is very likely to occur. This is due

to the way the handling of meat is not hygienic as well as meat distribution, each using an open tool.

*Salmonella sp.* is recognized as a major cause of food related illnesses among human beings and other warm blooded animals (Pradeep *et al.*, 2018). *Salmonella sp.* can contaminate beef because these bacteria live in animal intestines. The sanitation system before cutting and handling meat after cutting is also a cause of *Salmonella sp.*. Therefore, this study will detect *Salmonella sp.* in beef in slaughterhouses, traditional slaughterhouses, and traditional markets in Sangatta, East Kutai Regency. This is very important to do to make improvements in the sanitation system in handling meat to consumers, then can improve food quality, especially beef in Sangatta, East Kutai Regency.

## **MATERIALS AND METHODS**

### **Time and Location**

The research was conducted on March 26 2015 to April 8, 2015, at the Laboratory of Microbiology and Animal Health, Sangatta Agriculture and Animal Husbandry Service, East Kutai Regency.

### **Research Procedure**

Beef sampling in this study was conducted by Purposive Random Sampling at Slaughterhouses (RPH), Slaughterhouses (TPH) and traditional markets in Sangatta East Kutai Regency. The minimum sample weight of beef taken is 50 grams and the beef sample is put into a sterile plastic bag, then labeled and tested immediately at the Laboratory of Microbiology and Animal Health of Sangatta Agriculture and Animal Husbandry Service, East Kutai Regency.

### **Analysed Parameters**

Data obtained from each test was analyzed using a descriptive approach (Sugiyono, 2013), namely to determine the type of bacteria carried out by identification of morphological, biochemical, physiological and serological properties.

## **RESULTS AND DISCUSSION**

### ***Salmonella sp.* Test on Beef Samples**

Testing for the presence of *Salmonella sp.* on food, especially in beef, it is very important to remember that beef is a food ingredient that is very popular with the community to make processed foods such as meatballs, rendang, and others. *Salmonella sp.* become a food quality indicator because the impact will be very dangerous for consumers such as diarrhea, dizziness, vomiting and even death, therefore the presence of *Salmonella sp.* bacteria on food should be negative. In National Standardization Agency (2000) Indonesian National Standard (SNI)-7388-2009 in table 1. it is fresh, frozen meat (carcass and boneless) and minced meat, type of *Salmonella* contamination negative/25 g.

Testing the presence of *Salmonella sp.* bacteria in samples was conducted to determine the microbiological quality of beef samples in slaughterhouses, traditional cuts and those sold in the

Sangatta traditional market. The microbiological quality of a food product needs to be known to see the level of contamination of *Salmonella* sp. in these food products, so that the safety risk can be known if consumed. Bacterial contamination can be used as an indicator of decay that reflects quality and as an indicator of food storage. Contamination of *Salmonella* sp. bacteria in food can cause chemical changes and cause unpleasant odors.

In this study *Salmonella* sp. non-selective and selective tests were conducted to determine the presence of *Salmonella* sp. in beef samples from slaughterhouses, traditional cuts, and those sold in the Sangatta traditional market. *Salmonella* sp. analysis starts from the pre-enrichment stage. In the pre-enrichment stage, the media used is buffer pepton water (BPW). The pre-enrichment stage is carried out to enrich *Salmonella* sp.. The results showed that from 20 beef samples grown on BPW media, all did not show turbidity (negative).

The next step is selective enrichment using the *Salmonella* sp. test kit. The media selectively enriches the amount of *Salmonella* sp. in the sample. In *Salmonella* sp. test kit media selective compounds such as magnesium chloride combined with low pH ( $5.2 \pm 2$ ) inhibit the growth of natural microbes originating from the digestive tract in addition to *Salmonella* sp.. This is supported by D'Aoust (2000) who stated that in addition, the growth of *Salmonella* sp. is also supported by the presence of peptone in the media. Peptone contained in the *Salmonella* sp. media test kit serves as a source of nitrogen, carbon, and amino acids for *Salmonella* sp..

In the *Salmonella* sp. kit test media, selective compounds in the form of bile salts inhibit the growth of Gram positive bacteria. In addition there are selective compounds such as sodium thiosulfate and tetrionate to inhibit the growth of coliform bacteria. *Salmonella* sp. can grow because it has the enzyme tetrionate reductase. This is in accordance with the opinion of Oxoid (2011) which states that the presence of the tetrionate reductase enzyme in *Salmonella* sp. causes *Salmonella* sp. to be resistant to the toxic effects of tetrionate during enrichment.

Table 1. Test results for *Salmonella* sp. bacteria in slaughterhouses, traditional cuts and markets traditional Sangatta East Kutai Regency

No	Location	Testing days to	Amount of Beef Samples / Merchant					Total of sample
			1	2	3	4	5	
1.	Sangatta slaughter-house	1.	Negative	-	-	-	-	2
		2.	Negative	-	-	-	-	
2.	South Sangatta Traditional market	1.	Negative	Negative	Negative	Negative	-	7
		2.	Negative	Negative	Negative	-	-	
3.	Induk Sangatta Market	1.	Negative	-	-	-	-	6
		2.	Negative	Negative	Negative	Negative	Negative	
4.	Slaughter-houses for bulls	1.	Negative	Negative	-	-	-	5
		2.	Negative	Negative	Negative	-	-	
<b>Total:</b>							<b>20</b>	

The beef samples used in this study came from Slaughterhouses, traditional slaughterhouses, and Sangatta traditional markets in East Kutai Regency with a total sample of 20 samples. The test results of *Salmonella sp.* bacteria in beef samples can be seen in Table 1.

Based on Table 1, the results of the percentage (%) of *Salmonella sp.* bacteria in slaughterhouses, traditional slaughterhouses and Sangatta traditional markets in East Kutai Regency can be seen in Table 2.

Table 2. Test results for level (%) of *Salmonella sp.* in slaughterhouses, traditional slaughterhouses and Sangatta traditional market East Kutai Regency

No.	Place name	Sample total	Sample Positif (+) %	Sample Negatif (-) %
1.	Sangatta Slaughterhouse	2	0 %	100%
2.	South Sangatta Market	7	0 %	100%
3.	Sangatta Centre Market	6	0 %	100%
4.	Bull Slaughterhouse	5	0 %	100%

Based on the results of laboratory tests in 20 beef samples showed no *Salmonella sp.*. *Salmonella sp.* should not be present in meat even if it is one cell because it can have a negative impact on the health of humans who consume it. *Salmonella sp.* can cause diarrhea symptoms, abdominal pain, fever, vomiting until death.

The condition of slaughterhouses, TPH and traditional markets in Sangatta is still far from hygienic and incomplete facilities such as open slaughterhouses, inadequate slaughtering places, sewage channels that do not meet standards and so on so that after testing analysis in laboratory should allow positive results for the presence of *Salmonella sp.*, but because the analysis shows negative results, the pollution of *Salmonella sp.* is not as easy as other bacteria such as *Escherichia coli* although the conditions of the RPH, TPH and the market are not in accordance with the standard. National Standardization Agency (1999) SNI 01-6159-1999 that spatial planning must be designed so that it is in line with the process flow and has sufficient space so that all slaughtering activities can run well and are hygienic.

*Salmonella sp.* testing on meat samples showed negative results, this still requires further verification with more samples and is carried out periodically. *Salmonella sp.* may be in a limited amount of meat so it needs additional checks with more samples. *Salmonella sp.* does not have the ability to compete with other bacteria such as decomposing bacteria so that the growth of *Salmonella sp.* bacteria is inhibited. This is in accordance with the opinion of Supardi (2009) which states that *Salmonella sp.* cannot compete well with common microbes found in food. Therefore, growth is greatly hampered by the presence of other bacteria, such as decomposing bacteria, genus *Escherichia* and lactic acid bacteria (LAB).

### CONCLUSION

Based on the results of the study concluded that the results of laboratory tests on 20 samples of beef from abattoirs (slaughterhouses), animal slaughterhouses (TPH) and those sold in Sangatta traditional markets did not have *Salmonella sp.* (negative) bacteria.

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