

Detection of *Brucella abortus* in Beef Cattle which Transported Via Kendari Agricultural Quarantine in 2017

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INTRODUCTION

Brucellosis on cattle is mainly caused by *Brucella abortus*. Beside cattle, the bacteria is also able to infect other ruminants like buffalo, camel, swine, sheep, and goat. *Brucella* bacteria have nine biotypes causing similiar disease. The disease may lead to abortion which resulting in high economic losses. Brucellosis can be transmitted via oral and nasal. The source of infection are mainly plasenta and fetal fluid from infected cattle which contaminating feed and drinking water. A cattle farm may become infected from the introduction of new cattle from outside, whether it is male, female, calf, or adult cattle. In pregnant cow, *Brucella abortus* will develop rapidly because of the presence of erythritol, a type of carbohydrate which act as growth stimulant for *Brucella abortus*. It is commonly found in chorion, cotyledon, or fetal fluid. The Province of Southeast Sulawesi had a population of 331,958 cattle in 2016. The cattle is routinely transported to its neighbor province, South Sulawesi. In 2017, the cattle is transported 219 times with a total number of cattle of 3,038.

MATERIALS AND METHODS

The samples were taken from cattle transported to South Sulawesi via Kolaka and Tobaku harbors. A total of 2,075 serum were obtained and tested with RBT method. The study was conducted in the laboratory for animal quarantine, Kendari Agricultural Quarantine Agency from January to December 2017.

Rose Bengal Test (RBT). Rose Bengal Test is a rapid test intended to detect the presence of antibody of *Brucella abortus* in serum. The test procedure were based on OIE manual for brucellosis testing. A total of 25 µl of each serum sample and control were placed in a haemagglutination plate. An equal volume of *Brucella* antigen (Pusvetma Surabaya, ID) were placed near each serum. Each couple of serum and antigen then mixed thoroughly by a wooden or plastic rod producing circular movement until the mixtures were homogen. The mixture were rotated on a shaker machine for 4 minutes in room temperature. The agglutination were observed

immediately after the 4-minute period was completed. Any visible reaction was considered to be positive with various degree (+1 to +3) while the absence of agglutination was considered to be negative. The result of the test was analyzed descriptively.

RESULT AND DISCUSSION

Kendari Agricultural Quarantine Services were located at several ports in Southeast Sulawesi, including Kolaka and Tobaku ports which connect the Province of Southeast Sulawesi and South Sulawesi through ferry ships. During 2017, thousands of cattle were transported from Kolaka and Tobaku to South Sulawesi (Table 1). Cattle are disease-carrying media which were subjected to quarantine measures. One of the diseases that have to be prevented is brucellosis.

Table 1. Frequency and volume of cattle sent to South Sulawesi in 2017

No.	Quarantine Service Area	Departure of Cattle	
		Frequency	Volume
1	Kolaka	85	1,664
2	Tobaku	134	1,369
Total		219	3,038

The testing laboratory of Kendari Agricultural Quarantine is already accredited with SNI ISO/IEC 17025:2008 for RBT method. During 2017, a total of 2,075 serum were tested using RBT. The number of positive result were 8 samples (0.38%). Monthly result of RBT in 2017 can be seen in Table 2.

Brucellosis can be diagnosed by bacterial culture. However, it is more difficult and time consuming. Thefereore, serological test such as RBT is widely used because it is far easier and quicker. Rose Bengal Test (RBT) have high sensitivity in detecting the presence of *Brucella abortus* antibody. However, false positive results may also occur from cross reaction with antibodies from other bacteria such as *Yersinia enterocolitica*, *Escherichia coli*, and *Vibrio cholerae*. Cattle with negative result were released and allowed to depart while cattle with positive result were rejected and were not allowed to depart.

Table 2. The result of RBT on cattle serum in 2017

No.	Month	RBT Result	
		Positive	Negative
1	January	-	115
2	February	-	117
3	March	-	227
4	April	-	176
5	May	3	210
6	June	-	200
7	July	-	194
8	August	-	421
9	September	-	66
10	October	3	163
11	November	-	45
12	December	2	133
Total		8	2,067

One of RBT weakness is unable to differentiate positive result from natural infection and vaccination. Therefore, RBT is used as screening test for obtaining quick result. Positive result from RBT is often tested further with more accurate method such as Complement Fixation Test (CFT).

Table 3. Origin of cattle with positive result

No	Month	Positive Result	Source of Sample	Origin of Cattle
1.	May	3	Kolaka Quarantine Service	South Konawe and Bombana Regency
2.	Oct	3	Kolaka Quarantine Service	Bombana Regency
3.	Dec	2	Kolaka Quarantine Service	Bombana Regency

Table 3 showed the source of cattle with positive result from RBT. There are two regencies that act as a source of disease: Bombana and South Konawe. Both regencies is already known as endemic area for brucellosis. Therefore, the cattle from those regencies need to be supervised, examined, and tested before sent to other provinces. Cattle with negative result from the first RBT is not necessarily free from brucellosis. The second RBT is still needed with an interval time period of 90 days between both test. Agricultural quarantine service and local government in the destination area may perform the second RBT testing to ensure that the cattle is free from brucellosis. Therefore, the government program for the eradication of brucellosis can be implemented maximally.

CONCLUSION

Brucellosis is still prevalent in Southeast Sulawesi. The Agricultural Quarantine and local government is playing an important role to prevent

the spread of brucellosis by examining and testing the cattle both before and after shipment.

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