

DETECTION OF BRUCELLOSIS IN IMPORTED DAIRY CATTLE DURING ANIMAL QUARANTINE

Fauzul Muna¹, Ambar Retnowati², Yuswandi², Khariri¹

¹Center for Research and Development of Biomedical and Basic Health Technology

²Agriculture Quarantine Soekarno Hatta International

Corresponding author : arie.tegale@gmail.com

Abstract

Brucellosis is a zoonotic disease and caused by the bacterium *Brucella* sp. This disease is one of the infectious diseases that has spread throughout the world. Brucellosis is still an endemic disease in Indonesia with varying prevalence in various regions. The World Health Organization (WHO) estimates that as many as 500,000 new cases of brucellosis appear every year so that it is considered the most common zoonotic disease in the world. Transmission to humans occurs mainly through direct contact with infected animals, drinking milk from infected animals and breathing air contaminated by bacteria that cause brucellosis. The data used for the analysis is a report on income and quarantine actions on imported Australian cattle imported through Soekarno Hatta International Airport. Quarantine measures for 200 Frisian Holstein (FH) imported dairy cows were carried out on October 16, 2018 to November 15, 2018. Based on the Certificate of Health to Accompany Animals or Animal Reproductive, all cows were vaccinated with infectious bovine rhinotracheitis (IBR) and bovine viral diarrhoea (BVD). On examination of brucellosis with the rose bengal test (RBT) method 3 positive samples were obtained so that the examination was continued with the complement fixation test (CFT) method. On CFT examination all samples showed negative results. Supervision and inspection of imported dairy cows against brucellosis is very important in order to anticipate the possibility of entry and spread of the disease from abroad. Animal Quarantine Technical Implementation Unit at the entrances must carry out supervision, inspection and quarantine actions on the traffic of animals and their processed products which can act as a source of zoonotic transmission.

Keywords: brucellosis, CFT, RBT, cattle, zoonotic disease

1. Introduction

Brucellosis is an infectious disease caused by the bacteria *Brucella* sp. These bacteria are intracellular microorganism and zoonotic infection in animals which can cause reproductive problems, such as infertility, abortion, orchitis, and epididymistik[1,2]. Brucellosis in humans is characterized by symptoms such as weakness, intermittent fever, chills, sweating, joint pain, headache, and pain. whole body. According to the specific type of landlady, *Brucella* can be grouped into *Brucella abortus* (cattle), *B. canis* (dogs), *B. melitensis* (goat), *B. neomatae* (rodentia), *B. ovis* (sheep),

and *B. suis* (pigs)[3]. Transmission to humans occurs mainly through direct contact with infected animals, drinking milk from infected animals and breathing air polluted by bacteria that cause brucellosis[1].

Brucellosis is a contagious disease that has spread throughout the world. The disease has been eradicated in Scandinavian countries, while in other European countries, North America and Australia the incidence has decreased significantly. In Asian countries the average incidence of disease is only a few percent, but in certain places it can reach 50-60%. This disease is still endemic in Indonesia with varying



prevalence in various regions[4]. There are still several provinces in Indonesia that are not yet free of brucellosis in animals, namely Riau, West Sumatra, South Sumatra, Lampung, Bengkulu, Bangka Belitung, Bali, West Nusa Tenggara, Nusa East Southeast and all provinces on the island of Kalimantan[5]. The World Health Organization (WHO) estimates that as many as 500,000 new cases of brucellosis occur every year, making it the most common zoonotic disease in the world[6].

The availability of milk products needs serious attention both in quantity and quality. The government's attention to this is implemented through a food security program, so that people obtain food such as milk in sufficient quantities, is safe, nutritious, healthy, and halal for consumption [7]. Until now, domestic milk production has not been able to meet all the needs of the Indonesian people, so it requires import activities. The safety of animals and products of animal origin is an absolute, non-negotiable requirement [8].

The role and function of agricultural quarantine in the current era of globalization and free trade is very important and strategic in world trade [9]. The Agricultural Quarantine Agency is at the forefront of preventing the entry of quarantine animal pests (HPHK) from abroad into the country. In the importation of animals and animal products, the Agricultural Quarantine Agency plays a role in protecting the country from the threat of HPHK in order to remain free from diseases that do not exist in Indonesia. Quarantine measures for animals or products imported from abroad as a form of preventing the entry of HPHK from abroad into the country [10].

2. Methods

Quarantine measures for 200 imported Frisian Holstein (FH) dairy cows belonging to PT Agrijaya Prima Sukses were carried out from October 16 2018 to November 15 2018. This quarantine activity was carried out at Soekarno Hatta International Airport and the animal quarantine installation owned by PT Agrijaya Prima Sukses. Based on the Certificate Health to Accompany Animals or Animal Reproductive, all cows have been vaccinated with Infectious

Bovine Rhinotracheitis (IBR) and Bovine Viral Diarrhea (BVD).

Cows arriving from abroad are put in animal quarantine and installation. During the quarantine process, animals will be observed and controlled by providing forage and drinking water. Furthermore, health checks and treatment for sick or injured animals are carried out and specimen collection. The specimens taken were 10 ml of blood and feces. Laboratory examination of specimens for brucellosis detection was carried out using the Rose Bengal Test (RBT) method. If you get a positive result, the examination is continued with the Complement Fixation Test (CFT) method. If there are no symptoms of brucellosis based on the results of laboratory examination, then a certificate of release of animal quarantine by a quarantine veterinarian is given.

3. Results

Imported dairy cows are transported directly from Australia without prior transit using airlines. Upon arrival, inspection of the condition of the animals is carried out on the conveyance by quarantine veterinarians and quarantine paramedics. Physical examination is carried out to ensure that the animal is in a healthy condition. In addition, the number of animals and ear tag numbers were also checked. Interviews with pilots and flight crews were also conducted to find out other information during the trip regarding the condition and health of animals, for further document verification. After all the inspection is complete and the animal's physical condition is in accordance with the document, an Approval of Unloading is issued. On the same day, the cattle are transported to the animal quarantine installation by truck.

At the quarantine, all animals are subjected to observation and observation, physical inspection of animals, and checking the availability of food and drinking water. During the quarantine period, the health condition of the animals was generally good and there were no animals showing symptoms of illness or death. This is characterized by a good appetite, agile movements, no symptoms of diarrhea. The next treatment was taking 2.5 (triplo) blood samples and enough feces. Specimen examination was carried out at the Bogor Agricultural Ministry's

Veterinary Research Institute. In the examination of brucellosis using the Rose Bengal Test (RBT) method, 3 positive samples were obtained, so the examination was continued with the Complement Fixation Test (CFT) method. On CFT examination, all samples showed negative results.

4. Discussion

Various examination methods have been developed to detect brucellosis apart from observing the clinical symptoms. The detection of brucellosis is usually performed by serological methods to detect specific antibodies against certain *Brucella* bacterial cell wall antigens. Based on Keputusan Menteri Pertanian No. 828 / Kpts / OT.210 / 10/98 concerning Guidelines for the Eradication of Contagious Keluron Animal Disease (Brucellosis) in Livestock, for the purpose of serological disease observation, testing is carried out using RBT, MRT and CFT methods as well as other methods that can be determined by the Director General of Animal Husbandry [11]. Two of the serological methods used to examine brucellosis on imported dairy cattle samples are the Rose Bengal Test (RBT) method and the Complement Fixation Test (CFT). Serological examination can be performed on animals as initial testing. Isolation of *B.abortus* in cows is carried out by sending fluids, fetal membranes, milk, and supramamarian lymph nodes fresh and cold to the laboratory for examination.

The Rose Bengal Test (RBT) is a rapid inspection method commonly used to detect *Brucella* bacteria. This method is easy, simple and practical to do. This examination uses the principle of the ability of IgM antibodies to bind to antigens in serum. This method is a test using the agglutination method by reacting antigens and antibodies, each agglutination that is formed indicates a positive reaction. Examination with this method can be used as an excellent screening test, but is also very sensitive for detection in vaccinated animals. The results of the examination can be seen in a fairly short time, about 5 minutes. The RBT examination result still requires confirmation by CFT examination because of its low specificity [13,14].

The CFT method is a serological test that allows detecting antibodies that can activate complement. The immunoglobulins that can be activated are IgM and IgG [15]. Although CFT has high sensitivity and specificity, false positives can occur due to S19 and S45 vaccination. The false negative results are due to anti-complementary and prozone reactions due to the presence of IgG2 antibodies against *Brucella* bacteria which block IgG1 and IgM in chronic infections which can be prevented by double dilution. The incidence of false negatives is often found from examining population samples with a high prevalence [16]. The results of serologic testing on IgG2 and IgGA usually have lower sensitivity so that the best detection can be done on IgG1 [17].

The CFT method is recommended by the OIE as a method for detection of *Brucella* infection in international trading. This method is an accurate method if done correctly although it is more complex than the TBT method because it requires laboratory facilities for examination and trained personnel to maintain the titer of the examination material used [15]. The use of the CFT method for brucellosis examination is widely used for eradication programs in many countries as the definitive test [18].

Routine examination of brucellosis carried out in animal quarantine is carried out using RBT or Elisa methods and followed by CFT. This serial examination will increase the specificity of the test. The accuracy of the sensitivity and specificity of the method used is very important to obtain the results of the examination in accordance with the actual conditions [19]. Examination with the RBT and CFT methods of animals introduced from brucellosis endemic areas that are not given vaccination may pass false negatives because the less sensitive methods are unable to detect early infection [15,20].

5. Conclusion

After going through a long quarantine process, as many as 200 imported dairy cows belonging to PT Agrijaya Prima Sukses are in good health and can be released. Supervision and inspection of imported dairy cows for brucellosis is very important to do in order to anticipate the possibility of entry and spread of the disease

from abroad. Animal Quarantine Technical Implementation Units (UPT) at entrances must carry out supervision, inspection and quarantine measures against animal traffic and their processed products which can act as a source of zoonotic transmission.

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