

Antibody Survey of Bovine Viral Diarrhea in Bali Cattle

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Abstract. Bovine Viral Diarrhea (BVD) or malignant diarrhea in cattle is one of the animal diseases that causes economic losses in the cattle industry worldwide. The biggest economic loss due to infection by Bovine Viral Diarrhea is related to reproductive and calf disorders that continue to transmit the virus to other cattle. This study aims to determine the presence of Bovine Viral Diarrhea antibodies in Bali cattle. The sample uses Bali cattle's blood from 30 cows that are accommodated in 2 tubes that contain anti-coagulant and which do not contain anti-coagulant. After being processed to get serum, plasma and buffy coat cells, then the samples were examined using the ELISA method and presented descriptively. The results showed that there were positive suspects in Sobangan village, Badung with 8 out of 15 samples (53%) and positive suspects in the village of Payangan, Gianyar with 3 out of 15 samples (20%). Positive results are influenced by biosecurity of each type of sample farm, in Sobangan village is a large farm so biosecurity is difficult to implement and the spread of disease is faster than in Payangan village that have small farm type.

Keywords: Bali Cattle, Bovine Viral Diarrhea, ELISA.

I. INTRODUCTION

Bovine Viral diarrhea (BVD) is an infectious disease in cattle caused by a virus. This virus is easily transmitted among cows and has spread widely throughout the world. BVD viruses can be transmitted horizontally or vertically [16]. BVD has been endemic in Indonesia with reactor prevalence rates varying and, in some areas, quite high. BVD

disease in Indonesia first occurred in 1988 and attacked Balinese, Brahman, Brahman Cross, Peranakan Ongole (PO) breeds, male and female of all ages. BVD virus has a high morbidity but mortality is very low. In 2006 there were reported cases of BVD of 1190 cases in Indonesia.

The greatest economic loss due to infection by Bovine Viral Diarrhea Virus

(BVDV) is related to reproductive disorders [4]. Reproductive disorders due to infection by BVDV include failure of conception, early embryonic death, abortion, congenital malformations, weak birth calf, and persistent virus infection. Persistent BVDV infection is the most detrimental consequence because it is immunotolerant and is a factory producing BVDV that transmits the virus quickly and continuously throughout its life through direct contact with sensitive and unvaccinated cows [7]. Therefore, it is necessary to conduct research to detect BVD antibodies in Bali cattle so that initial data can be obtained and preventive measures taken to overcome BVD infection.

II. MATERIALS AND METHODS

This research was conducted from May 2019, samples were taken in the villages of Sobangan, Badung and Payangan Village, Gianyar, then the samples obtained were examined at the Veterinary Immunology laboratory of the Faculty of Veterinary Medicine, Udayana University. The sample uses cow's blood from 30 cows that are accommodated in 2 tubes that contain anti-coagulant and which do not contain anti-coagulant. After getting serum, plasma and buffy coat cells, then the sample is examined using the ELISA method. Then tabulate the data obtained to see if there is a positive ELISA result containing BVD antibodies. Then the data obtained are presented descriptively.

III. RESULT AND DISCUSSION

Table 1. Elisa Test Result of Antibodi Bovine Viral DiarrheaIn Bali Cattle at Sobangan Village, Badung.

Sample Code	Result
A1	0.865
A2	1.12*
A3	1.133*
A4	1.296*
A5	1.393*
A6	1.328*
A7	1.149*
A8	1.217*
A9	0.99
A10	0.882
A11	0.737
A12	0.896
A13	0.939
A14	1.029*
A15	0.763

Information: * = Positive

Tabel 2. Elisa Test Result of Antibodi Bovine Viral DiarrheaIn Bali Cattle at Payangan Village, Gianyar.

Sample Code	Result
G1	0.946
G2	1.091*
G3	0.894
G4	0.7
G5	1.337*
G6	0.989
G7	0.73
G8	0.985
G9	0.614
G10	0.615
G11	0.725
G12	0.716
G13	0.683
G14	0.724
G15	1.045*

Information: * = Positive

From the results of examination of Bali cattle samples for BVD antibodies by ELISA test in Sobangan Village, Badung as in Table 4.1 the results obtained are 8 out of 15 samples (53%) showing positive results with BVD antibodies, while the results of checking BVD antibodies in cattle Bali with ELISA test in Payangan Village, Gianyar as shown in Table 4.2 shows that 3 of the 15 Bali cattle samples (20%) tested positive for having BVD antibodies.

ELISA antigen test can be used to determine (screening) early in looking for animals that have persistent infections as the main infectious animals in the spread of BVD disease in farm [1]. This test is the latest breakthrough in detecting the early presence of persistent infection animals that have been proven to be accurate before a polymerase chain reaction (PCR) test is

done, but it will be more efficient when screening early because this test is fast and accurate [16]. The above research results can only be said to be suspect positive for BVD because to further ensure the virus is BVD it is necessary to carry out further tests such as Polymerase Chain Reaction (PCR), RT-PCR or other molecular tests.

Antibody serology test results obtained from positive studies, but in negative antigen serological tests caused by several things. Antibodies detected against the BVD virus in cattle breeding areas can occur due to natural infection during maintenance / fattening in the cage [7]. The spread of the disease occurs directly through contact with infected animals, especially those with persistent infections, while indirectly through food contaminated with urine, feces, oronasal secretions or from

fetal fluid abortion fetus [14]. Transmission can be carried between farms by officers who are in direct contact with infected cows. Infection occurs very quickly among sensitive cows by direct contact, but the clinical signs that are seen are not clear accompanied by an irregular incubation period of the disease [11]. High positive suspect results that occur in the village of Sobangan, Badung is likely to occur due to the type of the farm that has a large number of broodstock and calf cattle, which is approximately 200 Bali cattle in one place, resulting in rapid virus transmission, in addition to the application of biosecurity strict conditions are rather difficult to do with a large number of Bali cattle, such as in the village of Sobangan, Badung. This is different from the sample taken in Payangan Village, Gianyar where although it is still traditionally maintained by the family of farmers behind the house, the number of cows is not as much as in the village of Sobangan, Badung, so the positive suspect results are lower. Each breeder's family only has a maximum of 2 Bali cattle which are used as samples for this study. This has an effect on the spread of the disease which becomes localized in one cage in the breeder's family, the distance of the cage of each breeder's family is quite far and the breeder's family is more alert to supervise if the disease occurs in their domestic Bali cattle.

Adult Balinese cattle whose blood samples are taken on average do not show clinical symptoms of BVD, this is likely due to differences in the types of BVD where according to [8] BVD in Indonesia there are 2 types namely BVD-1 and BVDV-2, when seen from the occurrence of BVDV-2 more virulent than BVD-1 and both cannot be compared in terms of anatomic pathology and histopathology and definitive diagnosis

requires virological and molecular biology studies [17]. But not all BVDV-2 isolates cause severe clinical symptoms. In nature, avirulent BVDV-2 is more common than virulent BVDV-2 [21]. Usually infection by postnatal BVD virus is non-clinical, with a biphasic temperature rise with leukopenia followed by a specific immune response that can be measured by a serum neutralization test. In addition, ELISA antibodies can detect the presence of persistent infection (PI) in fetuses born to mothers infected by BVD in old pregnancy (9 months gestation) [10]. However, if the adult Bali cows we sampled gave birth to a calf, it is not yet known whether the calf would later be a persistent infection (PI), so this research needs to be continued to detect this.

V. CONCLUSION

Positive suspect results that occurred in the village of Sobangan, Badung (53%) are likely to occur due to the greater number of cows on the farm than the number of cows in the village of Payangan, Gianyar (20%) where the number of cattle is smaller. So biosecurity that is applied in the village of Sobangan, Badung is more difficult to do and the spread of disease is faster than in the village of Payangan, Gianyar. Balinese cattle whose blood samples are taken on average do not show clinical symptoms of BVD, this is likely due to differences in the type of BVD, but if giving birth calf is not yet known whether the calf will later as a persistent infection (PI) or not.

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