

SEROPREVALENCE TO CATTLE *BABESIA SPP.* INFECTION IN NORTHERN SAMAR**Ronaldo A. Amit**College of Veterinary Medicine, University of Eastern Philippines
Catarman, Northern Samar**ABSTRACT**

Babesiosis is caused by intraerythrocytic protozoan parasites of the genus *Babesia*, which is transmitted by ticks and has a worldwide distribution but the major economic impact of babesiosis is on the cattle industry. This study was conducted to screen 200 randomly selected cattle from 19 municipalities of Northern Samar for the presence of babesia antibodies using the Enzyme Linked Immunosorbent Assay (ELISA) test. Factors such as sex, age and breed of cattle were considered to determine the prevalence of babesia infection. The blood film technique was also done to morphologically identify *Babesia spp.* that causes the disease. The result of the serologic test was expected to determine the efficacy of ELISA as a diagnostic tool for *Babesia spp.* infection in Northern Samar, samples there-by providing baseline information on the prevalence of babesiosis in the province. The results of the ELISA Test revealed 25.00% seropositivity rate to *Babesia spp.* with the three geographical areas of the province demonstrating varying degrees of infection (Central Area, 13.00%; Pacific Area, 6.50%; and Balicuatro Area, 5.50%). The prevalence of babesiosis is independent of age and sex of cattle. The relationship of breed of cattle to the prevalence of the disease was not ascertained objectively because the farmer-owners did not keep records of their farm animals. What was clear was that all sampled cattles were crosses of native and imported breeds. The Blood Film Technique (BFT) identified the organism morphologically and validated the result of the ELISA. Both the ELISA and BFT confirmed the presence of Babseiosis among cattle in the province. The scientific study reported, for the first time, the presence and prevalence of *Babesia spp.* in the province of Northern Samar. Therefore, further epidemiological study is encouraged.

Keywords: cattle babesiosis, *babesia spp.* Northern Samar, seropositive rate

INTRODUCTION

Cattle, being one of the most important animals, should be protected from diseases. Babesiosis is one of the diseases notifiable to the Office International des Epizooties (OIE), which means that this disease is considered to be of socio-economic and/or public health importance within countries and that it is significant in the international trade of animals and animal products.

Symptoms and clinical signs could not be relied upon to obtain correct diagnosis hence several tools including serologic tests are needed to establish a correct diagnosis. Enzyme-Linked Immunosorbent Assay (ELISA) and an examination of a Giemsa-stained blood smear will lead to a confirmatory diagnosis of babesiosis. The author, as a steward of one of God's creations-cattle-would like to establish baseline information on the prevalence of babesiosis in the province of Northern Samar.

MATERIALS AND METHODS

Animal Sampling

Two hundred head apparently sick Cattle, regardless of age and sex, were sampled using the simple random sampling technique in 19 municipalities for blood collection and examination.

Las Navas, SilvinoLubos and Lope de Vega had no data on cattle population thus, these towns were not included in sample selection. Sample

population was prorated per municipality using the formula:

$$\text{Required Sample per Municipality} = \frac{\text{total sample required}}{\text{total provincial population}} \times \text{total municipal population}$$

However, during the actual conduct of the study, it was found that there were no cattle in Victoria and Lapinig.

The sample size was pegged at 200 due to the limitation of the Enzyme-linked Immunosorbent Assay (ELISA) Kit from the PAHC. However, the sample population represented 9.96% of the total cattle population in the study area.

Blood Collection, Blood Film and Staining Procedures

A minimum of 9ml blood sample was drawn from the jugular vein of each cattle, using vacutainers. From the sample, a drop of blood was used in the preparation of the thin and thick smears and the slides were wrapped in bond paper or tissues paper and brought to the laboratory for staining and microscopic examination to morphologically identify the parasites in positive samples.

Blood Preparation for ELISA Testing

The remaining blood in the vacutainers were allowed to stand overnight in a slanting position until the blood clotted. These were brought to the UEP Diagnostic laboratory for the preparation of the sera.

The clear serum was pipetted into a sterile vial and was kept frozen until ready for examination using the ELISSA test.

Data Analysis

Seropositivity rate was determined as the proportion of animals positive for babesia antibody using the formula:

$$\text{Seropositivity Rate} = \frac{\text{Number of Positive Sera}}{\text{Total Number of Serum Samples Examined}} \times 100$$

Prevalence of babesiosis as determined by Blood Parasite Examination was computed with the formula:

$$\text{Prevalence Rate} = \frac{\text{Number of Positive Smears}}{\text{Total Number of Blood Smears Examined}} \times 100$$

Further, data were analyzed using averages and percentages and are presented in graphs and tabular forms. Significant relationship between the existence of parasites and age, sex and breed of the samples were determined using chi-square (χ^2) analysis with the formula.

$$\chi^2 = \frac{\sum ([f_o - f_e] - .5)^2}{f_e}$$

Where: χ^2 = chi-square value
 f_o = observed frequency
 f_e = expected frequency

RESULTS AND DISCUSSION

Table 1. Profile of Cattle Babesiosis in Northern Samar

Seropositive Result of Enzyme-Linked Immunosorbent Assay (ELISA) Test							
Number of Samples		Positive		Negative			
		Frequency	Percentage	Frequency	Percentage		
200		50	25%	150	75%		
Age Group							
Age Bracket (Years old)	Total Number of Samples	Positive		Negative			
		Frequency	Percentage	Frequency	Percentage		
1-5	139	35	17.5%	104	52%		
6 and above	61	15	7.5%	46	23%		
Total	200	50	25%	150	75%		
Sex							
Geographic Area	Number of Samples	Male (17% of the Total Sample)		Female (83% of the Total Sample)			
		Number of Samples	ELISA Positive		Number of Samples	ELISA Positive	
			f	%		f	%
Balicutro	6	3	8.82	26	3	4.82	
Central	16	7	20.59	61	9	11.4	

Pacific	12	2	5.88	79	10	6.63
Total	34	2	35.29	166	38	22.89

Legend:

ELISA positive – presence of *Babesia spp.*

ELISA Negative – absence of *Babesia spp.*

The table shows the profile of Cattle Babesiosis in the province of Northern Samar in terms of seropositive in terms of seropositive result using ELISA Test, and age, sex and breed of the animals used as sample.

Results of the test for the 200 sampled cattle show that 50 or 25% tested seropositive while 150 or 75% tested negative. The data in the table confirm that the ELISA test as a diagnostic tool to *Babesia spp.* infection detected the presence of antibodies in the sera of sampled cattle *Babesia spp.* This suggests that Babesiosis as a disease occurs already among cattle in the province.

Moreover, the age bracket was limited to two (2), to identify the experimental animals based on production performance with the 1-5 years old grouping considered to be their prime, young and productive years while 6 years old and above are considered mature with low reproductive performance and about to be culled.

The table reveals that the cattle tested aged 6 years old and above and those with age brackets 1-5 years old manifested seropositivity to *Babesia spp.* demonstrating seroprevalence rates of 17.5% and 7.5%, respectively.

As shown by the data, the cattle populations in both age groups have already been infected with *Babesia spp.* However, the chi-square test revealed

that there was no significant difference in. This means that cattle, regardless of age, were susceptible to *Babesia spp.* and that the exposure of cattle in new areas of occurrence eventually developed antibodies. Therefore, age was not a factor in the prevalence of *Babesia spp.* infection.

The table also shows that there were more females (166) than males (34) sampled but the seropositivity rate was greater among the males (35.29%) than in females (13.25%). The study revealed therefore that *Babesia spp.* was more prevalent among males than females. This result might be due to the claim of the farmer-owners that bulls were loaned to other dispersal beneficiaries in nearby municipalities during breeding season thus increasing the chances of the bull's getting infected.

In this study, there were not enough data that may show the relationship of the breed of the cattle and the seroprevalence rates of the parasite because there were no established records among farmers as to the breed of their animals. In a research conducted by Derrota *et al.* (2002) in Batangas, it was found out that babesiosis and anaplasmosis were present throughout the province but it contented that there was little evidence of clinical disease suggesting a high degree of innate resistance to these diseases in local cattle.

The result of the statistical analysis using the chi-square test revealed that the prevalence of babesiosis infection was independent of the age and sex of cattle; while the breed of the experimental animals was not objectively ascertained to statistically subject its relationship to the prevalence of the disease.

CONCLUSION

Babesiosis, therefore, was already a disease among cattle in Northern Samar, even before this survey was conducted.

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