Development of an Enzyme-Linked Immunosorbent Assay to Study the Prevalence of Toxoplasmosis in Cattle in Sri Lanka

Inoka Jayamanna[1,2], Indunil N. Pathirana[1*] and R.P.V.J. Rajapakse [2*]

[1]Department of Animal Science, Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya, Sri Lanka
[2]Department of Veterinary Pathobiology, Faculty of Veterinary Medicine & Animal Science, University of Peradeniya, Peradeniya, Sri Lanka

Abstract

Toxoplasma gondii infection is a zoonotic protozoan infection that affects warm-blooded animals, including cattle. In cattle, *T.gondii* can cause abortions, birth defects, and stillbirths resulting in significant economic and reproductive losses. Consumption of infected meat and milk facilitates the zoonotic transmission. The objectives of the study were to: (1) modify an existing ELISA system to measure the prevalence of Toxoplasmosis among cattle (2) utilize the above test for serological diagnosis of Toxoplasmosis in cattle (3) compare the occurrence of Toxoplasmosis among cattle from different locations in Sri Lanka and also in imported cattle. 75 serum samples from 7 areas (Ambalantota, n=10; Embilipitiya, n=10; Anuradhapura, n=13; Padawiya, n=12; Polonnaruwa, n=10; Thanamalwila, n=10 and Vauniya, n=10) in Sri Lanka and 75 serum samples from imported cattle were collected for the study. An existing indirect ELISA system described previously for goats was modified to analyze serum samples. The antibody titres of 150 samples ranged from 0.102 to 1.246. The antibody titre of Ambalantota (0.335) was higher ($p<0.05$) compared with the antibody titre of Vauniya (0.617). The difference of antibody titres between local (0.486) and imported cattle (0.408) was nearly significant ($p=0.081$). The antibody titre of imported cattle was higher ($p<0.05$) compared with the antibody titre of cattle from Vauniya. The occurrence of toxoplasmosis in some selected locations was higher ($p<0.05$) compared with other tested locations. The highest occurrence of toxoplasmosis was reported from Polonnaruwa (80%; 8/10), whereas the lowest were from Ambalantota (20%; 2/10) and Thanamalwila (20%; 2/10). In conclusion, an existing ELISA system was modified to detect Toxoplasma antibodies in cattle. Antibody titres of Toxoplasma varied significantly at some specific locations in the country. The occurrence of toxoplasmosis infection was significantly different among some specific locations and imported cattle.

Keywords: Antibody, ELISA, Occurrence, Toxoplasmosis

[*]***Corresponding Authors:*** indunilvet@ansci.ruh.ac.lk; jayanthar@pdn.ac.lk