Epidemiological characterization of bovine brucellosis in Maranhão state, Brazil

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A cross-sectional study was conducted to estimate the prevalence of bovine brucellosis at the herd and animal level in Maranhão state, Brazil. In each selected herd, serum samples were collected at random from cows aged 24 months or more and a questionnaire was applied to identify risk factors for infection at the herd level. In total, 749 herds and 6,779 animals were surveyed. Geographic coordinates of each herd were collected and the spatial distribution of bovine brucellosis was studied using kernel density estimation. Variables influencing the risk of brucellosis at the herd level were analyzed using logistic regression. The herd-level prevalence of brucellosis was 11% (95% CI 9 to 14%) and the individual animal-level prevalence was 2.5% (95% CI 1.7 to 3.6%). Having more than 54 cows aged ≥24 months, renting pasture to third parties and the presence of wetlands on the farm increased the risk of a farm being brucellosis positive. Brucellosis-positive farms were identified all over the state, particularly in the centre and on the northwestern border. Little evidence of second order effects were observed up to scales of 0 to 10 km, which means that even if brucellosis had been diagnosed in one herd location, the likelihood of cases being identified on nearby farms was not increased. Analysis of the residuals of the logistic regression model identified areas of unexplained risk in the center of the state. These results may assist the animal health authorities in setting up the most appropriate strategies to control brucellosis in Maranhão.