Herd-level prevalence and associated risk factors for bovine cysticercosis in the State of Paraíba, Northeastern Brazil

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In Brazil, bovine cysticercosis is endemic in several states. However, some cases may be unnoticed, especially in mild infections, which make it relevant the use of serological tests with greater sensitivity than the postmortem routine inspection. Thus, immunodiagnostic testing alternatives, such as indirect ELISA and immunoblot have been recommended as an option for antemortem detection of bovine cysticercosis, allowing a more accurate early identification of infected animals. This study focused on estimating the herd-level and animal-level prevalences, and identifying the risk factors associated with herd-level prevalence for bovine cysticercosis in the State of Paraíba, Northeastern Brazil. The state was divided into three sampling groups: sampling stratum 1 (mesoregion of Sertão), sampling stratum 2 (mesoregion of Borborema), and sampling stratum 3 (mesoregions of Zona da Mata and Agreste). For each sampling stratum, herd-level and animal-level prevalences were estimated by a two-stage sampling survey. In the first stage, a pre-established number of herds (primary sampling units) were randomly selected; in the second stage, a pre-established number of cows aged ≥ 24 months were randomly selected (secondary sampling units). Ten animals were sampled in herds with up to 99 cows aged over 24 months; 15 animals were sampled in herds with 100 or more cows aged over 24 months; and all animals were sampled in those with up to 10 cows aged over 24 months. In total, 2382 animals were sampled from 474 herds. Serological diagnosis was initially performed by the indirect ELISA, and positive sera were confirmed by immunoblot. A herd was deemed positive if it included at least one positive animal in herds of up to 29 females, and two positive animals in herds with more than 29 females. The herd-level prevalence in the State of Paraíba was 10.8% (95% CI = 8.1–14.1), 10.3% (95% CI = 6.4%–16.1%) in the region of Sertão, 6.9% (95% CI = 3.9%–12.1%) in Borborema, and 13.8% (95% CI = 9.3%–20.2%) in Agreste/Zona da Mata. The animal-level prevalence was 2.3% (95% CI =1.6%–3.3%) in the State of Paraíba, 1.4% (95% CI = 0.8%–2.5%) in Sertão, 3.6% (95% CI = 1.7%–7.4%) in the region of Borborema, and 3.2% (95% CI = 1.9%–5.4%) in Agreste/Zona da Mata. The frequency of seropositive animals per herd ranged from 7.1% to 100% (median of 16.7%). The risk factors identified were as follows: animal purchasing (OR = 2.19) and presence of flooded pastures (OR = 1.99). The present study is the first one in Brazil to determine the prevalence of bovine cysticercosis at herd-level by using random sampling of herds and animals. Our findings suggest that bovine cysticercosis herd-level seroprevalence in the State of Paraíba, Northeastern

Brazil, is high, and support the idea that prevention measures should be applied at herd level and farmers could restrict the access of their cattle to flooded pastures. This knowledge might be useful for design of future effective control programmes.