Prevalence and Preliminary Genetic Characterization of Cryptosporidium spp. Isolated from Asymptomatic Heifers in Galicia (NW, Spain)

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RESULTS AND DISCUSSION

Cryptosporidium parvum oocysts were detected in 41 out of 291 heifers examined (14.0%) from 23 out of 58 herds (39.6%). All animals sampled were asymptomatic. The actual prevalence of infection may be underestimated because only one fecal specimen was collected per animal. If that specimen was identified as negative during a period when the animal was intermittently excreting oocysts, then the animal was considered negative. Cumulative prevalence of 100% has been reported in dairy calves at certain locations (Castro-Hermida et al. 2002b). However, in most cross-sectional studies, a lower infection rate has been reported (Castro-Hermida, González-Losada, and Ares-Mázás 2002a; Fayer et al. 2000b; Wade, Mohammed, and Schaaf 2000).

The intensity of oocyst shedding ranged between 10 and 782 oocysts/g of feces (mean 80.0 ± 126.7 oocysts/g of feces), values that are similar to those obtained in other studies of healthy cattle (Ralston et al. 2003). In our preliminary genotyping analyses, the samples showed 100% homology with C. parvum isolate 11 (AF221528). One of them displayed polymorphism in the hsp70 coding region (position 1254bp in the 11 hsp70 isolate sequence). A second codon position showed a change of A to G, that is predicted to code for an arginine instead of a lysine residue. More samples must be analyzed to determine the degree of diversity of Cryptosporidium species in our study population (Fayer et al. 2006).

It is difficult to compare the present data with that reported in other studies because in those other studies, analyses were performed on animals of different ages or the farms studied were chosen because of a history of animals with diarrhea or symptoms of other enteric illness. However, we believe that the results obtained in the present study reflect a serious situation, taking into account that the study was carried out on healthy heifers. The farms were selected at random and the only possible restriction was if a farmer did not agree to participate in the study. The heifers in Galicia may be an important source of environmental contamination with C. parvum and a zoonotic reservoir for this parasite.

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LITERATURE CITED


MATERIALS AND METHODS

Fecal samples were collected from 291 heifers selected at random from 58 dairy farms in Galicia (NW Spain). Cryptosporidium oocysts were detected by direct immunofluorescence using monoclonal antibodies (Aqua-Glo GIC Direct, FL and Comprehensive Kit, Waterborne Inc., New Orleans, LA). The number of parasites per gram of feces was calculated by number of cysts identified/volume of sample examined (ml) x weight of feces (g). In our preliminary genotyping assays we used PCR-based procedures to amplify and sequence the hsp70 gene of Cryptosporidium (LeChevalier et al. 2003).

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