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Sensitivity and specificity of culture and PCR of smegma samples of bulls experimentally infected with Tritrichomonas foetus.

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Abstract

The sensitivity (Se) and specificity (Sp) of different testing schemes were estimated for detecting Tritrichomonas foetus (T. foetus) in smegma samples from experimentally infected bulls. Culture and polymerase chain reaction (PCR) on smegma samples were evaluated alone and in parallel testing. Mature dairy bulls (n=79) were intrapreputially inoculated with T. foetus (n=19); Campylobacter (C.) fetus venerealis (n=13); both T. foetus and C. fetus venerealis (n=11); Tetratrichomonas spp. (n=9); C. fetus fetus (n=8); or were not inoculated (n=19). For each bull, smegma samples were collected for 6 week post-inoculation and tested for T. foetus by In Pouch TF culture and PCR. Most T. foetus-inoculated bulls became infected, according to culture (86.7%), PCR (90.0%), and both tests together (93.3%). In T. foetus-inoculated bulls, both tests combined in parallel on a single sample had a Se (78.3%) and Sp (98.5%) similar to two cultures (Se 76.0%, Sp 98.5%) or two PCR (Se 78.0%, Sp 96.7%) sampled on consecutive weeks. The PCR on three consecutive weekly samples (Se 85.0%, Sp 95.4%) and both tests applied in parallel on three consecutive weekly samples (Se 87.5%, Sp 95.6%) were similar to the current gold-standard of six weekly cultures (Se 86.7% and Sp 97.5%). Both tests used in parallel six times had the highest Se (93.3%), with similar Sp (92.5%). Tetratrichomonas spp. were only sporadically detected by culture or PCR. In conclusion, we have proposed alternative strategies for T. foetus diagnostics (for the AI industry), including a combination of tests and repeat testing strategies that may reduce time and cost for bull surveillance.