

MOLECULAR DIAGNOSIS FOR THE RAPID DETECTION OF BOVINE TUBERCULOSIS IN THE STATE OF KUWAIT

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Mycobacterium bovis is the causative agent of bovine tuberculosis (bTB), a zoonotic disease with an overall negative impact on the livestock industry. TB has been reported in Kuwait. Because of the adverse social and economic impact that the disease imposes on livestock and the people of Kuwait, development of surveillance, diagnostic, and control programs are needed to detect new cases and eradicate the disease. Hundred and four dairy cattle tested using the universally accepted comparative intradermal tuberculin test (CITT) was the primary test used during the survey work for assessing the prevalence of bTB in Kuwait's dairy herds. Rapid and highly sensitive molecular diagnostic tools, such as DNA Extraction from blood real-time PCR (polymerase chain reaction) and ELISA (enzyme-linked immunosorbent assay), have been evaluated and compared with traditional, delayed hypersensitivity- and slaughterhouse inspection-based diagnostic schemes. The total number of cases detected between 2012 and 2015 in 10 cattle farms in the state of Kuwait was 104 positive TB cases, which had a

mean prevalence of 2.1% per farm. Highest numbers of cases were detected in February 2015, with no seasonal patterns inferred. Spearman correlation coefficients and their corresponding p-values between disease status and both farm size ($p=0.43$, $p\text{-value}=0.032$) and agricultural area ($p=0.49$, $p\text{-value}=0.015$) were significant at the 95% confidence level. The overall hierarchical mixed-effect logistic regression analysis was significant ($p\text{-value}=0.0413$). As expected, our results suggested that the prevalence of TB detected cases didn't follow any seasonal patterns, first because, TB is a chronic disease and seasonality can't be quantified within 4 years of surveillance efforts. Second, case detection was highly dependent on the intensification of sample collection at a given season, in which the number of collected samples was substantially high in winter and low in summer seasons.

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