

## Serological Evidence of *Brucella* spp, *Coxiella burnetii*, *Chlamydophila abortus*, and *Toxoplasma gondii* Infections in Sheep and Goat Herds in the United Arab Emirates

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**Abstract :** A serological survey was carried out to determine the seroprevalence of *Brucella* spp, *Coxiella burnetii*, *Chlamydophila abortus*, and *Toxoplasma gondii* in sheep and goat herds in the UAE. A total of 915 blood samples [n= 222, [sheep]; n= 215, [goats]] were collected from livestock farms in the Emirates of Abu Dhabi, Dubai, Sharjah and Ras Al-Khaimah (RAK). An additional 478 samples (n= 244, [sheep]; n= 234, [goats]) were collected from the Al Ain livestock central market and tested by indirect ELISA for pathogen-specific antibodies with the *Brucella* antibodies being further corroborated by the Rose-Bengal agglutination test. Seropositivity for the four pathogens is variably documented in sheep and goats from the study area. Respectively, the overall livestock farm prevalence rates for *Brucella* spp, *C. burnetii*, *C. abortus*, and *T. gondii* were 2.7%, 27.9%, 8.1%, and 16.7% for sheep, and 0.0%, 31.6%, 9.3%, and 5.1% for goats. Additionally, the seroprevalence rates *Brucella* spp, *C. burnetii*, *C. abortus*, and *T. gondii* in samples from the livestock market were 7.4%, 21.7%, 16.4%, and 7.0% for sheep, and 0.9%, 32.5%, 19.2%, and 11.1% for goats respectively. Overall, sheep had 12.59 more chances than goats of testing seropositive for *Brucella* spp (OR, 12.59 [95% CI 2.96-53.6]) but less likely to be positive for *C. burnetii*-antibodies (OR, 0.73 [95% CI 0.54-0.97]). Notably, the differences in the seroprevalence rates of *C. abortus* and *T. gondii* in sheep and goats were not statistically significant ( $p > 0.0500$ ). The present data indicate that all the four study pathogens are present in sheep and goat populations in the UAE where coxiellosis is apparently the most seroprevalent followed by chlamydophilosis, toxoplasmosis, and brucellosis. While sheep from the livestock market were more likely than those from farms to be *Brucella*-seropositive than those, the overall exposure risk of *C. burnetii* appears to be greater for goats than sheep. As more animals from the livestock market were more likely to be seropositive to *Chlamydophila* spp, it is possible that under the UAE animal production conditions, at least, coxiellosis and chlamydophilosis are more likely to increase the culling rate of domesticated small ruminants than toxoplasmosis and brucellosis. While anecdotal reports have previously insinuated that brucellosis may be a significant animal health risk in the UAE, the present data suggest *C. burnetii*, *C. abortus* and *T. gondii* to be more significant pathogens of sheep and goats in the country. Despite this possibility, the extent to which these pathogens may nationally be contributing to reproductive failure in sheep and goat herds is not known and needs to be investigated. Potentially, these agents may also carry a potentially zoonotic risk that needs to be investigated in risk groups like farm workers, and slaughter house personnel. An ongoing study is evaluating the seroprevalence of bovine coxiellosis in the Emirate of Abu Dhabi and the data thereof will further elucidate on the broader epidemiological dynamics of the disease in the national herd.

**Keywords :** *Brucella* spp, *Chlamydophila abortus*, goat, sheep, *Toxoplasma gondii*, UAE

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