

Letter to the editor

Letter to the editor regarding “Brucellosis in Kuwait: an overlooked endemic zoonosis from a One Health perspective”Sulaiman A. Anagreyyah^{1*} and Mohammed A. ALJehani²¹Family Medicine Department, King Fahad Armed Hospital, Jeddah, Saudi Arabia²Family Medicine Department, Prince Sultan Military Medical City, Riyadh, Saudi Arabia*Corresponding author: Sulaiman A. Anagreyyah, Sanagreyyah@kfahh.med.sa

Article history: Received 15 December 2025; Accepted 20 January 2026; Available online 25 January 2026

Article information: Anagreyyah SA and ALJehani MA, 2025. *One Health Microbiol. Infect.* Vol. 1, No. 1: 39-41. <https://doi.org/10.66585/ohmi.2025.1.0007>**Abstract**

Not applicable

Keywords: Brucellosis, Epidemiology, Human cases, Kuwait, One Health**To the editor**

We read with interest the review by Alazemi and Musallam on brucellosis in Kuwait published in the current issue of *One Health Microbiology & Infection* [1]. The article provides a helpful summary of historical human disease data, available animal data, and control efforts. It appropriately presents brucellosis as a persistent One Health issue rather than merely a clinical infection. The overview of severe human complications, the ongoing presence of animal infection despite vaccination, and the continued risk from exposure to unpasteurized dairy products are especially valuable points. The review accurately highlights that brucellosis remains a neglected disease in Kuwait, warranting greater attention and improved management strategies [1]. However, several points need more emphasis to improve the article's relevance to public health and policy.

The review remains mostly descriptive and would benefit from a more focused analytical discussion of why brucellosis continues to persist in Kuwait despite decades of intervention. The available evidence shows that ongoing transmission is driven not only by animal infection and consumption of raw dairy products but also by structural issues common to many endemic countries in the Gulf and greater Middle East, including fragmented surveillance, cross-border livestock movement, incomplete traceability, inconsistent implementation of vaccination and test-and-slaughter programs, as well as unhygienic disposal of infected materials [2].

Kuwait does not operate in epidemiological isolation nor characterize brucellae. Research on isolating and characterizing *Brucella* species circulating in its animal populations remains limited [1], even though identifying the pathogen is the gold standard for diagnosis and crucial for tracing infection sources. Such data are essential for guiding vaccine selection, understanding transmission

patterns, and developing effective treatment and control strategies. Molecular evidence shows that Kuwaiti *Brucella melitensis* strains cluster with those from Iraq, Syria, Turkey, and other parts of the Middle East, highlighting regional transmission links [3]. Therefore, the regional dimension warrants greater attention. Throughout the region, human infection is still mainly linked to consuming unpasteurized dairy products and direct contact with animals, while ongoing endemicity is maintained by political, logistical, and veterinary public health challenges [4].

Camel brucellosis requires more thorough attention due to its likely epidemiological significance. Although the article recognizes its endemicity, this aspect remains insufficiently developed. Current evidence shows that camel brucellosis is understudied, with notable seroprevalence reported in endemic regions. Practices such as mixed herding with small ruminants and the consumption of raw camel milk may be key factors in maintaining zoonotic transmission [5].

In Kuwait and neighboring Gulf countries, camels play a vital role in pastoral systems, valued for milk, meat, and other products, and often move freely between herds and grazing areas without showing clear signs of illness. This mobility, along with their frequent contact with other livestock, raises the risk of cross-species transmission [5]. Despite their significance, brucellosis in camels remains underrecognized, with limited data available on its epidemiology, diagnosis, and control.

This gap raises concerns that camels may not be sufficiently included in current control programs, potentially serving as an overlooked reservoir of infection. Additionally, the ongoing consumption of unpasteurized camel milk and the movement of animals among desert herds, wildlife interfaces, and organized farms further

increase the risk of transmission to both animals and humans.

The review recognizes that many human studies are case-based and that livestock surveillance is incomplete, but it does not discuss the operational consequences. Relying on serology without broader culture confirmation, limited molecular typing, and the lack of integrated human–animal datasets make it difficult to distinguish true temporal changes in transmission from variations in reporting or diagnostic access. This is particularly important when interpreting fluctuations in reported human cases. The manuscript would be more effective if it clearly distinguished between observed case trends and the underlying limitations of surveillance quality.

Nomadic livestock practices facilitate cross-border movement between Kuwait and neighboring endemic countries, including Saudi Arabia and Iraq, thereby contributing to the persistence and re-emergence of brucellosis. Although animal movement is now officially regulated, informal trade and illegal transboundary movement of livestock and animal products continue, maintaining transmission risks. Addressing this issue requires stronger control measures, including the implementation of unified animal identification and traceability systems, supported by strict enforcement and penalties for illegal movement. These efforts should be boosted through public awareness and coordinated government action. Additionally, nationwide mass

vaccination programs, especially in border regions, could play a crucial role in reducing transmission and enhancing disease control [6].

The article would benefit from a clearer message on control priorities. A concise framework could highlight five immediate actions: sustained small-ruminant vaccination, systematic inclusion of camels in surveillance and control plans, national livestock identification and traceability, stricter food safety enforcement for raw milk and dairy products, and a formal One Health platform linking the Ministry of Health, veterinary authorities, and border/quarantine services (Figure 1). Regional experience shows that successful control depends not only on technical tools but also on cross-sector coordination, breeder engagement, and continuous implementation.

In conclusion, this review addresses an important and underexplored topic and offers a useful foundation for future research. Its impact could be strengthened by more clearly situating Kuwait's findings within the wider Gulf context, expanding discussion of camel-related risks, acknowledging surveillance gaps, and translating the evidence into a more actionable One Health control strategy. Given Kuwait's relatively small size and strong resources compared with many endemic settings, it represents a context where coordinated and effective brucellosis control may be particularly achievable.

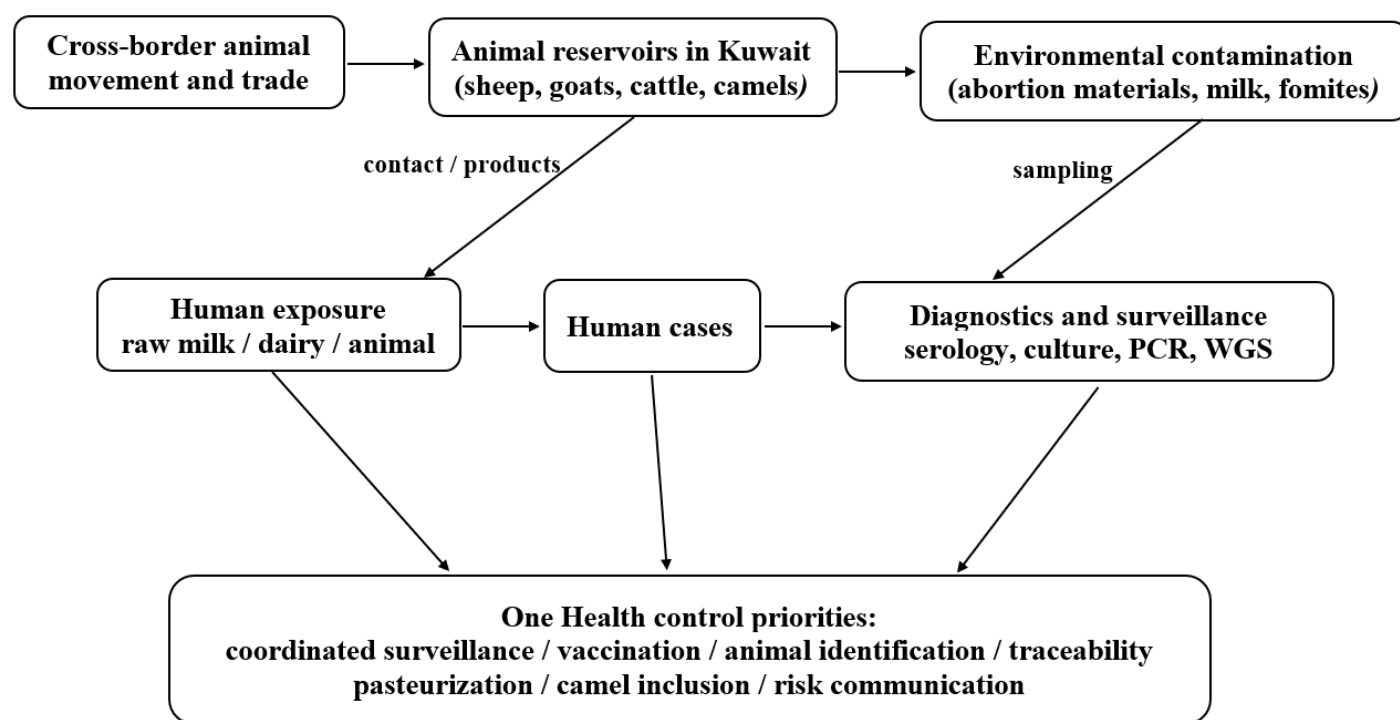


Figure 1: Proposed schematic summarizing the major pathways sustaining brucellosis in Kuwait: Cross-border animal movement, endemic infection in livestock reservoirs, human exposure through raw dairy products and animal contact, and the surveillance-control feedback loop required for sustained reduction.

Declarations and supplementary information

Acknowledgments: Not applicable.

Author contributions: Not applicable.

Funding source: Not applicable.

Conflict of interest statement: Not applicable.

Ethics statement: Not applicable.

Data availability: Not applicable.

Supplementary materials: Not applicable.

Declaration regarding the use of generative AI and AI-assisted technologies in the writing process: Not applicable.

Publisher's note: The claims, opinions, and data presented in this manuscript are solely those of the authors and do not necessarily reflect the views of Infinity IPC, its editors, or reviewers. Infinity IPC and the editors disclaim any responsibility for damages, injuries, or other consequences that may arise from the use of the information contained in this article.

References

1. Alazemi YSN, Musallam I. Brucellosis in Kuwait: An overlooked endemic zoonosis from a One Health perspective. *One Health Microbiol Infect.* 2025;1(1):20-27.
2. Dadar M, Al-Khaza'leh J, Fakhri Y, Akar K, Ali S, Shahali Y. Human brucellosis and associated risk factors in the Middle East region: A comprehensive systematic review, meta-analysis, and meta-regression. *Heliyon.* 2024;10(14):e34324. <https://doi.org/10.1016/j.heliyon.2024.e34324>
3. Sun M, Jing Z, Di D, Yan H, Zhang Z, Xu Q, et al. Multiple locus variable-number tandem repeat and single nucleotide polymorphism based *Brucella* typing reveals multiple lineages in *Brucella melitensis* currently endemic in China. *Front Vet Sci.* 2017;4:215. <https://doi.org/10.3389/fvets.2017.00215>
4. Bagheri-Nejad R, Krecek RC, Khalaf OH, Hailat N, Arenas-Gamboa AM. Brucellosis in the Middle East: Current situation and a pathway forward. *PLoS Negl Trop Dis.* 2020;14(5):e0008071. <https://doi.org/10.1371/journal.pntd.0008071>
5. Dadar M, Foster JT. Camel brucellosis: A narrative review of epidemiology and control strategies. *Vet Res Commun.* 2025;50(1):61. <https://doi.org/10.1007/s11259-025-11006-1>
6. Heidary M, Dashtbin S, Ghanavati R, Mahdizade Ari M, Bostanghadiri N, Darbandi A, et al. Evaluation of brucellosis vaccines: A comprehensive review. *Front Vet Sci.* 2022;9:925773. <https://doi.org/10.3389/fvets.2022.925773>