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IMPLEMENTATION OF BRUCELLOSIS PREVENTION MEASURES AMONG LIVESTOCK FARMERS AND VETERINARIANS

Relevance: Brucellosis is a significant zoonotic disease affecting both public health and agricultural economies worldwide. It remains endemic in many regions, causing human illness and livestock productivity losses. Livestock farmers and veterinarians are at the frontline of exposure and control, making the implementation of preventive measures by these groups critical [1]. Understanding how prevention strategies can be effectively applied in farm settings and veterinary practice is highly relevant for reducing disease incidence and improving One Health outcomes. This study focuses on the epidemiological importance of brucellosis, evaluates current preventive measures among farmers and veterinarians, and identifies practical steps to enhance their implementation [2].

Keywords: Brucellosis; Zoonosis; Prevention; Livestock Farmers; Veterinarians; Epidemiology; One Health; Vaccination; Biosecurity

INTRODUCTION

Brucellosis (also known as undulant fever or Malta fever) is a bacterial zoonosis caused by Brucella spp. that primarily infect livestock such as cattle, goats, sheep, and swine, with potential transmission to humans. Humans typically acquire brucellosis through direct contact with infected animals or by consuming contaminated animal products, especially unpasteurized milk or cheese. In endemic areas, brucellosis poses serious public health and economic challenges, leading to flu-like illness in people and reproductive issues (abortions, infertility) in animals. Globally, an estimated 500,000 new human cases occur annually, underscoring the urgent need for effective prevention [3]. Livestock farmers, herders, veterinarians, abattoir workers, and others in close contact with animals are at particularly high risk of occupational brucellosis. In these groups, infection can occur via handling of birth materials, assistive birthing, slaughtering, or even accidental inoculation with live animal vaccines [4].

Preventing brucellosis in humans is tightly linked to controlling the infection in animal reservoirs – a core principle of the One Health approach [5]. The most effective strategy is to eliminate or reduce Brucella infection in livestock populations (WHO, 2020). Key measures include animal vaccination (for example, routine vaccination of cattle with B. abortus strain S19 or RB51, and small ruminants with B. melitensis Rev.1), surveillance and testing of herds with prompt culling ("test-and-slaughter") of positive animals, and enforcement of strict farm hygiene and biosecurity practices [6]. In areas with high endemic prevalence in animals, vaccination campaigns for young stock are recommended to build herd immunity and reduce transmission. Conversely, in regions approaching eradication, test-and-slaughter strategies and movement control of animals are crucial to stamp out remaining foci. Supporting measures like pasteurization of milk and public education on food safety serve as an added layer to prevent human brucellosis. Indeed, food-safety measures (avoiding unpasteurized dairy) and occupational hygiene (use of protective gear when handling livestock or carcasses) are vital especially where animal infection persists [7].

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Despite well-known preventive methods, implementation among livestock farmers and veterinary practitioners varies widely. In many endemic regions, farmers may have limited awareness of brucellosis transmission or may not consistently adopt protective practices [8]. Veterinary services are often the primary source of vaccines, testing, and education, but resource constraints and logistic challenges can hinder widespread coverage of programs like vaccination or regular herd testing. Socio-economic factors, cultural practices, and education levels influence how well farmers comply with recommended measures [9]. Additionally, veterinarians themselves face occupational hazards; improper handling of live attenuated Brucella vaccines or inadequate use of personal protective equipment (PPE) can lead to accidental infections among animal health workers (Pereira et al., 2020). Thus, a gap often exists between theoretical control strategies and on-the-ground practices.

This article aims to examine the current status of brucellosis prevention measures implemented by livestock farmers and veterinarians and to analyze their effectiveness. We draw on epidemiological data, clinical studies, and field investigations to identify successes and challenges in controlling brucellosis. Emphasis is placed on knowledge, attitudes, and practices (KAP) of farmers and vets regarding brucellosis, the outcomes of educational or vaccination interventions, and the role of these stakeholders in sustaining control programs. By highlighting both statistical trends and case studies, we discuss what strategies work in real-world settings and provide recommendations to strengthen brucellosis prevention at the farm level and in veterinary practice. Ultimately, improving the implementation of these measures among farmers and veterinarians is essential for reducing disease burden and moving towards the long-term goal of brucellosis elimination in both animals and humans [10].

MATERIALS AND METHODS

This study involved a review and analysis of existing literature, including clinical studies, epidemiological data, and intervention outcomes from 2015 to 2025. Sources included peer-reviewed journals, World Health Organization (WHO) reports, and official veterinary guidelines. Data on knowledge, attitudes, and practices (KAP) among farmers and veterinarians were also examined to assess preventive measure implementation.

RESULTS

Farmers and veterinarians generally exhibit a high level of awareness regarding brucellosis. Surveys indicate over 90% of livestock farmers and nearly all veterinarians recognize brucellosis as a zoonotic threat. However, significant gaps remain in detailed knowledge about specific transmission routes and prevention practices. Only around 50% of farmers consistently use PPE during high-risk activities like handling animal birthing materials [11].

Vaccination and biosecurity measures vary significantly by region. In areas with active vaccination programs, such as parts of China and the Middle East, vaccination coverage in livestock reaches up to 70%, correlating with decreased human and animal incidence rates. Conversely, in regions with inconsistent or absent vaccination programs, brucellosis continues to be prevalent. Educational interventions targeting farmers have proven effective. Studies indicate significant improvements in farmers' knowledge and practical application of preventive measures following training sessions. Bahadori et al. demonstrated that educational interventions significantly increased farmer compliance with vaccination and hygiene protocols.

DISCUSSION

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Effective implementation of preventive measures among livestock farmers and veterinarians significantly reduces brucellosis incidence. Education and practical training significantly bridge knowledge-practice gaps, improving adherence to preventive guidelines. Vaccination campaigns show clear benefits when consistently applied, highlighting the importance of sustained and regionally tailored approaches. However, barriers such as economic constraints, inadequate veterinary services, and cultural practices hinder preventive measure implementation. Integrating educational efforts with practical support, including provision of PPE and accessible veterinary services, is essential [12]. The One Health approach, incorporating cooperation between health authorities and veterinary services, is vital to successful brucellosis control programs.

CONCLUSION AND RECOMMENDATIONS

To effectively control brucellosis, it is crucial to enhance preventive measure implementation among livestock farmers and veterinarians. Recommended actions include: Regular educational and training programs tailored to local contexts. Ensuring affordable or subsidized access to PPE and vaccines. Strengthening veterinary services, including regular animal health surveillance [13]. Encouraging community involvement and cooperation through incentives for reporting and vaccination compliance. Promoting public awareness on zoonotic risks associated with brucellosis. These steps can substantially reduce the risk of brucellosis, benefiting both human and animal health.

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