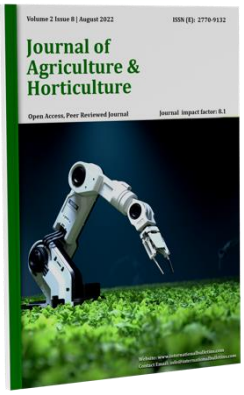

ZOONOTIC BACTERIAL INFECTIONS: A COMMON THREAT TO HUMANS AND ANIMALS

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Abstract: This article examines the impact of zoonotic bacterial infections on public health and livestock, focusing on the principal etiological agents (Salmonella spp., Campylobacter spp., Brucella spp.) and their epidemiological characteristics. Using Khorezm region as a case study, the analysis highlights risk factors related to sanitation, drinking water quality, and food safety. The spread of antibiotic-resistant strains is evaluated as a serious public health concern, underscoring the need to develop effective control measures.

Keywords: zoonotic bacterial infections, salmonellosis, campylobacteriosis, brucellosis, antimicrobial resistance, Khorezm region.

Zoonotic bacterial infections are diseases transmitted between humans and animals through microbial agents, posing a serious global public health threat. Humans are particularly susceptible to food-borne zoonotic bacterial pathogens, many of which primarily affect the gastrointestinal system. These infections are widespread worldwide [1].

Most of these microorganisms have zoonotic potential, exerting not only detrimental effects on human health but also undermining economic stability. Statistical data indicate that bacteria account for nearly two-thirds of food-borne illnesses globally.

Animals serve as the primary reservoirs of numerous food-borne zoonotic pathogens. Consequently, food products of animal origin—meat, dairy products, and eggs — constitute the main sources of human exposure [2].

Salmonellosis is among the most prevalent zoonoses affecting humans and animals, with over 1.3 million cases reported annually in the United States alone [3]. The infection is typically transmitted through contaminated food products such as meat, eggs, and dairy [3, 4].

Campylobacteriosis ranks as one of the leading food-borne infections, predominantly caused by *Campylobacter jejuni*. The disease is commonly associated with diarrhea, fever, and abdominal pain [5]. In 2023, the European Union reported campylobacteriosis and salmonellosis as the two most frequently detected zoonoses [6].

Brucellosis represents a severe, multi-organ infection in humans and animals, caused by *Brucella* spp. Transmission occurs through consumption of unpasteurized dairy products, direct contact with infected animals, or inhalation [3,7]. The disease may progress to chronic forms, causing complications in the musculoskeletal system, bones, heart, and central nervous system [3,8]. Archaeozoological evidence suggests that the domestication of ungulates and dogs in Asia (12,000–33,000 years ago) facilitated the emergence of well-adapted *Brucella* pathogens and their stable reservoirs. Anthropogenic changes in wildlife habitats may also have influenced host susceptibility and the natural selection of *Brucella* populations [7].

The significance of zoonotic bacterial infections extends beyond individual cases, requiring broad-scale approaches that integrate human, animal, and environmental health within the *One Health* framework [9]. European reports indicate that food-borne zoonoses remain consistently high [6].

This study conducted a multi-sectoral investigation of zoonotic bacterial infections (salmonellosis, campylobacteriosis, brucellosis) in Khorezm region. Prior studies documented the association between diarrheal diseases and poor sanitation as well as drinking water quality [10].

The population under study included:

- **Humans:** patients presenting with diarrhea,
- **Animals:** cattle, sheep, and goats,
- **Food chain:** poultry products .

Laboratory diagnostics followed international standards: *Salmonella* spp. were detected using ISO 6579-1:2017 [11.12].*Campylobacter* spp. by ISO 10272-1:2017 [13], and *Brucella* spp. according to the WOAH (formerly OIE) Terrestrial Manual [14].

Results demonstrated that *Salmonella* spp. could be isolated in 8–10% of human samples and 20–30% of poultry products. *Campylobacter* spp. were detected in 5–9% of human cases and 20–25% of poultry samples [15]. Serological evidence of *Brucella* antibodies was identified in 2–7% of livestock herds and 1–2% of human samples. Antibiotic resistance was observed in 40–60% of strains, particularly against ampicillin, tetracycline, and nalidixic acid.

These findings confirm the circulation of zoonotic bacterial infections in Khorezm region and their close association with sanitation and hygiene factors. A comparison with brucellosis studies from Samarkand region indicates that consumption of raw milk and direct animal contact remain significant risk factors [16].

Conclusion

Zoonotic bacterial infections represent a shared threat to both humans and animals. Protecting livestock and public health requires strengthening food and water safety, expanding brucellosis prevention programs, and enhancing community hygiene awareness. Special attention should be given to monitoring antimicrobial resistance and implementing effective control strategies.

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