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5TH INTERNATIONAL CONFERENCE

ANTIMICROBIAL RESISTANCE - CURRENT STATE AND PERSPECTIVES

FROM SCIENCE TO PRACTICE



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PROVINCIAL SECRETARIAT FOR AGRICULTURE, WATER
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PRESENCE OF ANTIBIOTIC AND SULFONAMIDE RESIDUES IN RAW AND STERILIZED BOVINE MILK

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ABSTRACT

In modern food production, the presence of antibiotic and sulfonamide residues in milk represents a significant concern for food safety and public health. This study aimed to determine the occurrence of antibiotic and sulfonamide residues in raw bovine milk and commercially available sterilized bovine milk using the Delvotest® SP-NT. Delvotest® SP-NT is a qualitative microbiological screening assay used for the detection of antibiotics classes including: penicillins, tetracyclines, cephalosporins, macrolides, aminoglycosides, other antibiotics (chloramphenicol, dapsone, lincomycin, rifaximin, and trimethoprim), as well as sulfonamide residues in milk.

The Delvotest® SP-NT kit contains the indicator microorganism *Bacillus stearothermophilus* var. *calidolactis*. In a prepared nutrient agar (ampoule), spores are present with a growth indicator dye. After sample inoculation and incubation for 3h, spore growth results in a color change of the medium from purple to yellow. The absence of a color change after the incubation period indicates the presence of inhibitory substances (antibiotics or sulfonamides).

A total of 551 milk samples collected between 2020 and 2025 were analyzed, including 74 raw bovine milk samples and 447 sterilized bovine milk samples. Screening for antibiotic and sulfonamide residues was performed in accordance with the standard operating procedure (SOP 3-17-210) for the Delvotest® SP-NT. The presence of antibiotic or sulfonamide residues was detected in 6 (8.1%) of the raw bovine milk samples, whereas none of the sterilized bovine milk samples showed detectable residues. The positive findings in raw bovine milk were recorded in 2020 (33.3%), 2021 (8.7%), 2024 (14.3%), and 2025 (6.7%), while no residues were detected in samples collected in 2022 and 2023.

These findings indicate a sporadic presence of antibiotic and sulfonamide residues in raw bovine milk, with variations observed between the studied years. The higher number of positive samples in raw bovine milk compared to sterilized bovine milk can't be attributed to thermal processing, but is primarily related to the origin of the samples. Specifically, sterilized bovine milk samples originated from imported products or from dairy processing plants that implement routine screening controls upon raw bovine milk intake, whereas raw bovine milk samples were collected from agricultural farms, where control measures may be less stringent. The presence of residues represents a significant risk to food safety and public health, particularly in the context of antimicrobial resistance.

These results highlight the need for continuous monitoring, rational use of antibiotics, and the implementation of a One Health approach.

Key words: *Delvotest® SP-NT; Antibiotic and sulfonamide residues; Raw bovine milk; Sterilized bovine milk.*

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