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S2 DETERMINATION OF FLUOROQUINOLONES IN MILK WITH ENZYME-LINKED IMMUNOSORBENT ASSAY (ELISA) SCREENING METHOD

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Introduction: Fluoroquinolones (FQs) are a group of broad-spectrum antibiotics which are widely used to treat or prevent bacterial infections as well as to promote growth in veterinary and aquatic medicine. They prevent bacterial DNA from unwinding and duplicating. These residues may cause bacterial resistance, allergic hypersensitivity, toxic effect predicating a potential risk to human health. Due to their side effects in public health, legislation regarding the control and to monitor these residues are given in EU Council Directive 96/23/EC and EU Council Regulation 37/2010/EU. The aim of this study was determination of fluoroquinolones in milk with ELISA method.

Material and Methods: A total of 130 milk samples, were examined for quinolone antibiotics and were collected during 2015 as part of national monitoring residue plan. The samples were collected and delivered from authorized veterinary inspectors. The samples were analyzed by ELISA test kit for detection of quinolones (type AB685 from TECNA, Trieste, Italy). The methods were validated according to the recommendations laid down by European Commission Decision 2002/657/EC.

Results: The obtained data confirmed that the methods were appropriate for detection of antibiotics determined, at the concentration level of interest. The linear regression analysis showed good correlation coefficients with R^2=0.994. The validation process was carried out according to Commission Decision 2002/657/EC criteria. The detection limit (LOD) for fluoroquinolones was 6.17 (μg/kg), while detection capability (CCβ) was 77.62 (μg/kg). The recoveries ranged between 75.03%. The obtained values for CCβ were less than MRLs (Maximum Residue Limits). None of the analyzed samples showed presence of over the minimum required performance level value of the screening method.

Conclusion: Monitor of antibiotics residues is necessary to ensure food safety and to prevent exposure of the consumers. Method successful validation

according to the European Union requirements and its rapid, simple, good sensitivity and specificity to achieve the unambiguous identification of fluoroquinolones in milk. Milk in Macedonia in average, contains low levels antibiotics residues and it could be considered as safe for human consumption.

Key words: fluoroquinolones, residues, milk, validation, ELISA