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SCREENING OF RAW MILK SAMPLES FROM REPUBLIC OF MACEDONIA FOR RESIDUES OF SULFONAMIDES

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INTRODUCTION

As antimicrobials sulfonamides are one of the most frequently used at food producing animals for prevention and treatment of infection diseases caused by bacteria or as a feed additives to improve feed efficiency and growth. The presence of residues of these drugs might have various adverse effects for humans: allergic reactions in some hypersensitive individuals, possible disruption of the intestinal microflora and problems related with drug persistency at the microorganisms. The maximum residue limits (MRL's) for tetracycline according to Commission Regulation 37/2010/EU are set at 100 µg/kg. The most widely used screening methods for detection of residues of sulfonamides in food are microbiological and immunochemical.

MATERIALS AND METHODS

In this paper a screening for presence of total sulfonamides in 1233 raw milk samples (915 of cow's, 245 of sheep's and 83 of goat's) was performed, applying indirect competitive ELISA test. The samples originated from 251 farms and 78 diary houses. Sulfonamides extraction and the procedure of the assay was performed according to the producer's instruction (Europroxima, Netherlands). The method validation was previously performed and published [2], and the method was "fit-for-purpose".

RESULTS

The screening analysis of total sulfonamides obtained a values over LOD in 182 samples (14.76 %). Fifteen of them were suspicious for a violative presence of sulfonamides over the determined $CC\beta$ value. Concerning the different types of milk, the prevalence of total sulfonamides was 14,64 %, 13,92 % and 18,07 % for cow's, sheep's and goat's milk, respectively. 13 samples of cow's milk contained sulfonamides over the $CC\beta$ value, while one sample of sheep's and one of goat's milk were suspicious for MRL violation.

DISCUSSION

The presented results of screening indicates that some possibility for inappropriate administration of sulfonamides at food producing animals is present. There is no significance between the presence of total sulfonamides in cow's milk samples originated from farms and diary houses, 13.12 % and 13.42 % ($p=0.05$), as well as between the sheep's milk samples 14.29 % and 12.80 % ($p=0.05$). The prevalence of suspicious samples varies from 1.42 % for cow's milk samples, 1.20 % for goat milk samples to 0.42 % for sheep's milk samples. These figures are comparable to the results from screening (0,81 %) published by Abjean et al. [3]. To make the final judgment for the compliance of the milk samples in which the amount of total sulfonamides is over the $CC\beta$ value, it is obligatory to perform confirmatory analysis of the suspicious samples according to the requirements laid down in the Decision 2002/657/EC.

Key words: Sulfonamides, screening, milk, ELISA, detection capability