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Analytical methods

Determination of the total content of some sulfonamides in milk using solid-phase extraction coupled with off-line derivatization and spectrophotometric detection

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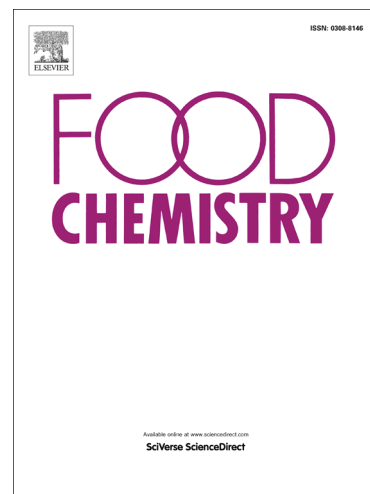
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1 **Determination of the total content of some sulfonamides in milk using solid-**
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9

10 **Abstract**

11 A simple screening method for isolation and determination of the total content of some
12 sulfonamides in milk using solid-phase extraction and a color reaction is described. This
13 procedure is based on SPE of sulfonamides on hypercrosslinked polystyrene, elution with
14 acetonitrile and off-line derivatization with *p*-dimethylaminocinnamaldehyde in acetonitrile
15 followed by spectrophotometric determination. The reaction produces intense violet–red color
16 and can be easily used both for quantitation of sulfonamides using spectrophotometry and for
17 naked-eye semi-quantitative estimation. Maximum absorption of the reaction product was
18 determined at 540 nm. The Lambert-Beer's law was obeyed in the range of 0.07 – 3.0 $\mu\text{g mL}^{-1}$ in
19 eluate, with the squared correlation coefficient (R^2) of 0.9875 – 0.9995, and the relative standard
20 deviation (RSD) of 3 – 4 %. The limits of SAs detection using preconcentration were of 0.02 –
21 0.03 $\mu\text{g mL}^{-1}$. The proposed method can be recommended as a routine screening method for
22 quantitation of sulfonamides in milk.

23 *Keywords:* sulfonamides, milk, solid-phase extraction, hypercrosslinked polystyrene,
24 spectrophotometry, *p*-dimethylaminocinnamaldehyde
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27 **1. Introduction**

28 Sulfonamides (SAs) are an important class of antibacterial drugs used in medicine and
29 veterinary practice [García-Galán, Díaz-Cruz, & Barceló, 2008]. SAs act as bacteriostatic agents
30 and possess chemotherapeutic activity against infections caused by gram-positive and gram-
31 negative bacteria and some protozoa (causative agents of malaria, toxoplasmosis, etc.). Being
32 one of the oldest classes of antimicrobial drugs, SAs have been used for treatment of humans and

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