Aflatoxin M1 in Milk Powders: Processing, Homogeneity and Stability Testing of Certified Reference Materials

Abstract:
As part of the certification campaign of three candidate reference materials for the determination of aflatoxin M1 (AfM1) in whole milk powders, homogeneity, short and long-term stability tests of naturally contaminated milk powders have been performed. The homogeneity of two AfM1 contaminated milk powders was studied by taking samples at regular intervals of the filling sequences and analysing in triplicate for their AfM1 contents by liquid chromatography with fluorescence detection (LC FLD) using random stratified sampling schemes. The homogeneity testing of the AfM1 "blank" milk powder material was performed by determining the nitrogen content because AfM1 levels were below the limit of detection of the most sensitive determination method. The short-term stability of AfM1 contaminated milk powders was evaluated at three different storage temperatures (+4, +18, and +40 °C). After storage times of 0, 1, 2 and 4 weeks samples were investigated utilising LC FLD. The long-term stability study comprised of measurements after 0, 6, 12 and 18 months after storage at 20 and +4 °C. Analyses were done by LC FLD. On the basis of the homogeneity tests the materials were found to be sufficiently homogenous to serve as certified reference materials (CRMs). Corresponding uncertainty contributions of 0.23 0.89 % were calculated for the homogeneity. The stability measurements showed no significant trends for both short- and long-term stability studies. The long-term stability uncertainties of the AfM1 contaminated milk powders were 7.4 and 6.3 % respectively, for a shelf life of six years and storage at a temperature of 20 °C.

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