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Food stuffs radio contamination by ⁹⁰Sr: Analytical methods, mean levels in food and contribution to risk assessment

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⁹⁰Sr is considered as an important contaminant relating to food supply chains, but comprehensive studies about this type of contamination in food are lacking. In this communication, two radiochemical methods, validated for the determination of radiostrontium in liquid and solid matrices, are described. Moreover, the related control activity, developed in the last 4 years by Italian National Reference Center for the detection of radioactivity in feed and foodstuff, is reported. More in depth, the described radiochemical methods are characterized by high sensitivity (minimal detectable activity equal to 6 mBqL⁻¹ and 8 mBqkg⁻¹ for liquid and solid matrices, respectively), linearity (as determination coefficient r²)=0.999, precision (as CV%) in the range 13%-15%, trueness (as recovery%) in the range 89%-106% and ruggedness. Regarding control activity, 176 liquid and 260 solid foods, were analyzed. Milk samples result were the most important indicator about ⁹⁰Sr contamination, within liquid matrices (mean 90Sr activity concentration: 0.058 BqL⁻¹). Among other liquid foods, wine/spirits and water were the most contaminated, with mean contamination levels equal to 0.022 and 0.035 BqL⁻¹, respectively. Regarding solid matrices, cheeses produced from sheep's milk showed to be the most contaminated (mean level: 1.237 Bqkg⁻¹). Meat products and seafood showed not significant contamination levels. Among vegetables, contamination levels detected in cacao/chocolate and spices resulted comparable with those measured in cheeses obtained from cow's milk. A final interesting aspect was the not negligible mean contamination level detected in animal feeds (raw materials), equal to 1.557 Bqkg⁻¹.

Biography

Marco Iammarino is a Food Technologist and a Chemical Surveyor. He is a Researcher of Istituto Zooprofilattico Sperimentale della Puglia e della Basilicata of Foggia (Italy), since 2002. He deals with Food Quality and Safety, Analytical Chemistry applied to Food Analysis, Research & Development and Analytical Method Validation. In particular, he has developed several analytical methods (HPLC, HPIC, CE and LSC) for the determinations of food additives (nitrites, nitrates, sulphites, polyphosphates, organic acids, etc.), radionuclides, mycotoxins and drugs in foods and feed materials. He has published more than 100 articles in peer-reviewed and academic journals, congresses proceedings and books.

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