



SCIENCE • FOOD • SOCIETY

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SUPPLEMENT

14. Assessment of food contamination and dietary intake of lead and thallium in a Northern Italy population

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Lead and thallium are heavy metals released in the environment after natural and anthropogenic activities. Food and water intake are the major sources of human exposure to these elements. In this study, we aimed at characterising lead and thallium content in foods consumed in northern Italy population, to estimate the dietary intake of these metals. To undertake this that we bought food samples in markets and groceries collected during the period from October 2016 to February 2017 in the Emilia-Romagna region, and we measured their element content using inductively coupled plasma-mass spectrometry. Finally, after assessing dietary habits of an Emilia-Romagna community by using a validated food frequency questionnaire, we eventually estimated dietary intake of these metals in that community. In the 890 analysed food samples, the highest lead contamination levels were found in seafood, vegetables, sweets and beverages. The estimated dietary intake of lead was 5.758 (interquartile range (IQR): 4.547–7.427) µg/day, corresponding to 0.089 (IQR: 0.069–0.113) µg/kg of body weight per day, with cereals, beverages and vegetables as major contributors. For thallium, one-third of specimens showed very low levels below the limit of detection, with the highest contamination levels in vegetables, dry fruits and sweets. The dietary intake of thallium was 0.236 (IQR: 0.183–0.312) µg/day, mainly from vegetables, beverages, cereals and sweets. In conclusion, our study provides an estimation of lead and thallium intake in a northern Italian community and shows a generally low exposure levels from dietary sources.

15. Exposure estimation for ochratoxin A and aflatoxins due to red chilli powder consumption in a Chilean rural area

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Ochratoxin A (OTA) and aflatoxins (AFs) are carcinogenic toxins produced by fungi, whose exposure is associated with the consumption

and handling of contaminated foods. In Chile, the National Programme of Surveillance (PNV) of Mycotoxins in Food of the Ministry of Health has found both mycotoxins in dry chilli pepper often in high levels. The aim was to estimate OTA and AFs exposure by red chilli powder consumption in a Chilean rural area by the Probable Intake (PI) estimation, based on: (a) reported consumption of red chilli powder; and (b) OTA and AFs concentration in red dry chilli according to the PNV of Mycotoxins of 2016. Normal distribution of data and probabilistic models based on Monte Carlo simulation were assumed. According to the food consumption survey, 26% of the subjects are dry chilli consumers, with a mean of 1.93 (± 2.26) g/day, without significant differences between gender and ages. The reported 2016 prevalences of OTA and AFs in red chilli powder were 45% (13/29) and 21% (6/29), with average levels of 19.87 (± 20.36) and 1.8 (± 0.72) ng/kg respectively. The estimated mean IP was 1.185 (± 1.172) ng/kg weight/day for OTA and 0.082 (± 0.065) ng/kg weight/day for AFs. In a worst-case scenario, the IP would be 33.5 ng/kg weight/day for OTA and 1.5 ng/kg weight/day for AFs. In Chilean rural areas, exposure to OTA due to red dry chilli consumption would be low in average consumption but could reach dangerous levels in the worst-case scenario. Both toxins are present in foods consumed in Chile, so it is urgent to study other sources and measure biomarkers in the population for a more accurate exposure assessment.

16. Occurrence of different mycotoxins (including emerging mycotoxins and ergot alkaloids) in feeds from Spain

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Mycotoxins are toxic secondary metabolites produced by certain fungi. Among these, there are well known hazards such as aflatoxins (considered as carcinogenic by the IARC) or ochratoxin A. Currently, several mycotoxins are considered in the EU legislation and maximum contents have been established in different food commodities. However, there are still some mycotoxins with no limits established, but with some evidences of adverse effects on human health. These are the so-called emerging mycotoxins, including some *Fusarium* toxins such as enniatins and beauvericin.

In a recent survey, 228 feed samples for pigs from different locations in Spain have been analysed in our laboratory, trying to explore the occurrence of mycotoxins (including aflatoxins B1, B2, G1 and G2, ochratoxin A, fumonisins B1 and B2, citrinin, zearalenone, deoxynivalenol, fusarenone X, sterigmatocystin, T2-toxin, HT2-toxin, enniatins A, A1, B and B2, beauvericin and 12 ergot alkaloids). The