

LEVELS OF HEAVY METALS IN ITALIAN MARKETED CANNED TUNA

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Introduction

Fish products are essential and irreplaceable components of human diet; nevertheless, they could result in a risk to the health of consumers due to the potential content of some xenobiotics such as heavy metals and persistent organic contaminants (Debeka et al., 2004; Storelli et al., 2005). Constant control network and surveys are valuable tools in order to prevent such risk and to ensure product quality and consumers' safety. The aim of the current study was to measure the levels of some heavy metals (Hg, Pb, Cd) in samples of marked canned tuna in olive oil.

Methods

Samples of canned tuna were chosen among to the most popular commercial brands and obtained from Italian market between 2010 and 2011, although the packaging of the product was performed either in Italy or elsewhere. Samples were packaged both in cans or glass. Each sample was analyzed by atomic absorption spectrophotometry (AAS-Zeeman effect and HMS). Briefly, aliquots of each sample (0.50 ± 0.02 g) were digested in 5 ml of ultrapure trace-select HNO₃ 65% (Carlo Erba) and 2 ml of 30% w/w H₂O₂ in a microwave digestion system (Milestone, Start D). The final volume was obtained by ultrapure deionized water. Metal concentrations in the digested samples were determined by atomic absorption spectrometer (Aanalyst 600 Perkin-Elmer) equipped with graphite furnace with L'VOV platform for Pb and Cd, while FIAS 100 hydride system (Perkin-Elmer) was used for the determination of the total Hg.

Results and Discussion

The results showed that levels of Cd and Hg were always within the law limits and, in many samples, below the detection limit. Pb was found in concentrations exceeding the law limits in 9.8% of the analyzed samples. In conclusion, the results of the current study, quite reassuring in terms of food safety, highlighted the need to constantly monitor the levels of some chemical contaminants in fish products such as heavy metals that might endanger the health of the consumers.

References

- Debeka, R. et al., 2004. Survey of total mercury in some edible fish and shellfish species collected in Canada in 2002. Food Addit. Contam. 21: 434-440.
- Storelli, M.M. et al., 2005. Accumulation of mercury, cadmium, lead and arsenic in swordfish and bluefin tuna from the Mediterranean Sea: A comparative study. Mar. Pollut. Bull. 50:993-1018.