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P13: *Anisakis* spp. larvae in marketed products made of herring (*Clupea harengus*)

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Background

Atlantic herrings (*Clupea harengus*) are the third most commercialized species in the European Union and common hosts of *Anisakis* spp. larvae.

Objective

To assess the occurrence and viability of *Anisakis* spp. larvae in herring products sold in Italy.

Materials and Methods

120 products (50 smoked whole and 70 filleted herrings) were visually inspected and digested using Trichineasy® (CTSV srl, Brescia). For whole herrings, viscera and muscle were separately digested. Collected nematodes were checked for viability, identified, counted and stored until molecular analysis. The positivity rate and the larval density per gram, at muscle and visceral level, when possible, were calculated; differences were investigated by Chi-square, Kruskal-Wallis and Mann-Whitney tests.

Results

At least one *Anisakis* spp. larva was found in 56 products (46.7%) and 1715 dead larvae were collected. Most of them (1559, 91%) were found in the viscera of 49 of the 50 whole herrings (98%). A highly significant difference ($p < 0.0001$) was observed between the positivity rate and larval density of the remaining 156 larvae at muscle level: 149 larvae were found in the muscle of 31 whole herrings (positivity rate 62%, 0.022 larval density/g) while only 7 in the 70 filleted products (positivity rate 10.7%, 0.001 larval density/g). All larvae were molecularly identified as *A. simplex*.

Discussion and Conclusion

Although no live larvae were found, dead visible larvae represent a defect making the product unfit for human consumption, especially in the case of heavy infections. In addition, the allergenic potential of dead larvae is debated. The significant difference between muscle tissue of whole and filleted herrings, results in different level of risk exposure depending on consumers' preferences.

Perspectives

Differences in the production processes of whole and filleted herrings should be further investigated and quality control procedures should be implemented by producers.