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TRACE ELEMENTS IN WILD AND FARMED ATLANTIC BLUEFIN TUNA (*THUNNUS THYNNUS L.*) FILLET

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Environmental pollution by metals is a recognized problem worldwide and it has been demonstrated that some marine organisms may bioaccumulate metals in their tissues [1]. Tunas are an important source of nutritional molecules and elements, but, being at the top of trophic chains, it can accumulate conservative contaminants such as heavy metals [2]. Consequently, from an ecological and safety point of view it is important to know the content of these pollutants in this specie, widely consumed as food.

In this study, trace elements (Cd, Pb and Fe) levels were determined by atomic absorption spectrometry in the muscle of Mediterranean bluefin tuna (*Thunnus thynnus*). A total of 68 samples were collected: wild samples ($n = 30$) were captured near Sardinia island (Italy) and farmed samples ($n = 38$) were from *Fish and Fish Ltd.* fish farm (Malta). Mean trace elements content (mg kg^{-1} wet weight) in wild and farmed, respectively was found as: Cd, 0.014 and 0.021; Pb, 0.11 and 0.026; Fe, 13 and 7.5. Concerning priority pollutants (cadmium and lead) all samples showed values well below the EU limit. A comparison between the two groups showed that no statistically significant difference was found for Cd whereas for Pb wild samples had concentrations significantly higher (about 4 fold) than the farmed ones ($p = 1,97 \cdot 10^{-8}$). The level of Fe demonstrated that both groups could be considered good products for the intake of this element, although lower levels were found in the farmed group. Relations between metal concentrations and biometric parameters were evaluated: generally, no correlation with weight were found, whereas some correlation with size were highlighted. Tuna food safety was evaluated considering the European maximum levels for contaminants in foodstuffs (EU 1881/2006): for Cd and Pb both groups represent a safe food, even if farmed specimens are safer concerning lead.

Concerning Fe the recommended dietary allowance (RDA) is 14 mg/day; therefore, both tuna groups supply about 15% of Fe content daily providing a good quote of this essential element.

From these results we can conclude that farmed tuna, such as the wild one, represents a safety and healthy seafood for the consumers, encouraging the farming activities due to an ever growing consuming of this fish.

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References

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- [2] Annibaldi, A.; Truzzi, C.; Carnevali, O.; Pignalosa, P.; Api, M.; Scarponi, G.; Illuminati, S. Determination of Hg in Farmed and Wild Atlantic Bluefin Tuna (*Thunnus thynnus* L.) Muscle. *Molecules* 2019, 24, 1273.