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Speciation of iron and zinc in cured ham to assess the curing process

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Traceability in cured ham process is a difficult task. In this study, we used Synchrotron XAS analysis to direct determination of Fe and Zn species in ham muscle and Zn species in visible fat (intramuscular fat) of Iberian dry-cured ham, IDCH.
Ham samples were obtained from certified IDCH from south of Spain at different curing time ranging from three to forty months. XAS spectra obtained at both Max Lab and ALBA Cells Synchrotrons allow the direct identification of Fe and Zn species in target samples containing low concentrations of Fe and Zn that have not been altered by extraction techniques. Corresponding spectra of individual reference compounds included both organic and inorganic species of Zn(II), Fe(III) and Fe(II) usually present in mammalian meat products.
Results for iron indicate that both organic and inorganic compounds are present in IDCH muscle, three main facts were observed: 1) inorganic iron is always found in less proportion than organic iron, 2) remarkable differences on iron species are found between surface and bulk muscle samples and 3) percentage of Iron (II) species increases with curing time. With respect to Zn, findings can be summarize as follows: 1) inorganic species were found relatively higher than organic species in IDCH muscle, 2) this difference increases in fat samples, 3) difference between surface and bulk samples are lower than those obtained for iron species. Correlation between results obtained and IDCH curing time will be presented.

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