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Evaluation of the effect of salmon muscle adhesion treated with antibiotics on polymer-coated food containers

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The originality of the research lies in the study of the effect of new production procedures of salmon on metal packaging with multilayer Polyethylene Terephthalate (PET) polymer coatings. The aquaculture production of salmon involves special foods and the application of antibiotics for disease control. The protective coating employed is part of the metal–polymer container, which shows surface defects in manufacturing. The salmon farming processes have an impact on the adhesion of postmortem muscle to the can walls, producing surface and structural changes affecting the functionality and limiting the useful life of metal containers, and further compromising their recycling as eco-material in the fish packaging industry. This work characterized the changesoccurring in the multilayer PET polymer and steel of containersby electron microscopy, X-ray Diffraction (XRD), Nuclear Magnetic Resonance (NMR), 3D- AFM and Raman spectroscopy analyses. We developed a robust method for the identification of residues of multiple antibiotics: Florfenicol, florfenicol amine, oxytetracycline, chloramphenicol and erythromycin is administered to salmon, using reverse-phase High Performance Liquid Chromatography (HPLC) coupled to TSQ Vantage™ triple quadrupole mass spectrometer for Selected Reaction Monitoring (SRM). Also, the presence of proteins attached to the PET coating was evaluated with 12% SDS-PAGE. The results showed no evidence of detectable levels of antibiotics in the PET, but the presence of cholesterol and alpha carotene on the polymer surface after the denaturation of proteins, which together producechanges at the structural level in the protective coating of the container.

Biography

Ernesto Zumelzu is a Metallurgical Engineer and completed his PhD in Condensed Matter Physics at the University of Valladolid, Spain. He also coordinates the Chilean Nanodyf Group of the Ibero-American Program for Science, Technology and Development (CYTED) network. He served as Director of Research and Development at Universidad Austral de Chile between 2006 and 2013. He has published extensively with over 50 indexed publications (ISI) in his field and is a referee of several leading scientific journals. In addition, he has participated in scientific collaborations with MIT, International Copper Association (ICA), European Union (ALFA) and Ibero-American programs.

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