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Study of penetration and distribution of florfenicol in feed for salmon with FTIR imaging and chemometric techniques

Camila Y Bastidas, Carlos Von Plessing, José Troncoso and Rosario del P Castillo
Univeristy of Concepcion, Chile

Fourier Transform Infrared Imaging and Multivariate Analysis were used to identify, at microscopic level, the presence of florfenicol (FF), an antibiotic used in salmon industry as therapy against several diseases affecting the salmon farming. Since FF is added to the feed pellets by surface-coating and considering that the distributional homogeneity of an active principle in a pharmaceutical formulation is very important to ensure its effectiveness, we studied how much FF penetrates evaluating its distribution from the surface to the center of the pellets. Hyperspectral images obtained with FTIR imaging system in attenuated total reflection mode (ATR) with pixel size of $6.25\ \mu\text{m} \times 6.25\ \mu\text{m}$ in different zones of the feed pellets with FF concentration of $1.28 \pm 0.004\ \text{mg FF/g of pellet}$, were analyzed with partial least squares – discriminant analysis (PLS-DA). We described FF distribution in images obtained from the surface to the center of the pellets at $100\ \mu\text{m}$ and $150\ \mu\text{m}$ and we found

the absence of FF at $200\ \mu\text{m}$ and $800\ \mu\text{m}$ (center of the pellets), showing that FF distribution is heterogeneous and it remains close to the surface. Even the very low concentration of FF in the pellets, we demonstrated the powerful ability of the used spectroscopic technique and multivariate analysis to study this active principle into a complex matrix and at microscopic level, with results that allow monitoring the incorporation of the drug to the feed pellets.

Biography

Camila Y Bastidas is completing her PhD in Sciences and Analytical Technology in Universidad de Concepción, Chile. She has worked as Professor Collaborator of Instrumental Analysis at Department of Instrumental Analysis, Universidad de Concepción, Chile.

cbastidas@udec.cl