Development of an Appropriate Method for the Determination of Multiple Mycotoxins in Pork Processing Products by UHPLC-TCFLD

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Abstract : Mycotoxins, harmful secondary metabolites produced by certain fungi species, pose significant risks to animals and humans worldwide. Their stable properties lead to contamination during grain harvesting, transportation, and storage, as well as in processed food products. The prevalence of mycotoxin contamination has attracted significant attention due to its adverse impact on food safety and global trade. The secondary contamination pathway from animal products has been identified as an important route of exposure, posing health risks for livestock and humans consuming contaminated products. Pork, one of the highly consumed meat products in Taiwan according to the National Food Consumption Database, plays a critical role in the nation's diet and economy. Given its substantial consumption, pork processing products are a significant component of the food supply chain and a potential source of mycotoxin contamination. This study is paramount for formulating effective regulations and strategies to mitigate mycotoxin-related risks in the food supply chain. By establishing a reliable analytical method, this research contributes to safeguarding public health and enhancing the quality of pork processing products. The findings will serve as valuable guidance for policymakers, food industries, and consumers to ensure a safer food supply chain in the face of emerging mycotoxin challenges. An innovative and efficient analytical approach is proposed using Ultra-High Performance Liquid Chromatography coupled with Temperature Control Fluorescence Detector Light (UHPLC-TCFLD) to determine multiple mycotoxins in pork meat samples due to its exceptional capacity to detect multiple mycotoxins at the lowest levels of concentration, making it highly sensitive and reliable for comprehensive mycotoxin analysis. Additionally, its ability to simultaneously detect multiple mycotoxins in a single run significantly reduces the time and resources required for analysis, making it a cost-effective solution for monitoring mycotoxin contamination in pork processing products. The research aims to optimize the efficient mycotoxin QuEChERs extraction method and rigorously validate its accuracy and precision. The results will provide crucial insights into mycotoxin levels in pork processing products.
Keywords : multiple-mycotoxin analysis, pork processing products, QuEChERs, UHPLC-TCFLD, validation

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