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Enhancing Coffee Sector Integrity through Multispectral Microscopy

The roasted and ground coffee sector faces a regulatory challenge with a lack of a specific method for detecting adulteration fraud, highlighting the need for more robust approaches. In collaboration with Brazil's Ministry of Agriculture, Livestock, and Supply (MAPA), OpenScience developed a multispectral microscope for scientific fraud detection in coffee. MAPA provided 142 samples for analysis, including arabica and robusta coffee with common adulterants. Spectra from images underwent Principal Component Analysis (PCA), flagging impurities. For distinguishing coffee types, a Partial Least Squares-Discriminant Analysis (PLS-DA) model was applied, offering a swift fraud control solution. This innovation not only addresses regulatory gaps but also establishes a robust industry standard, ensuring coffee quality. These technologies enhance transparency, providing a tool for authorities and producers. Efficient fraud detection is crucial for preserving the sector's integrity and global economic significance, making it vital to pursue more effective methods. The project's promising results showcase its potential in maintaining the coffee sector's reputation and authenticity.

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Food authenticity and fighting food fraud

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