The feasibility of applying NIR and FT-IR fingerprinting to detect adulteration in black pepper

Black pepper is the most widely used spice in the world. Spices are highly vulnerable to economically motivated adulteration as they are high value products and traded along complex supply chains. The main fraud opportunity is to add cheaper bulking materials. Near and Fourier-Transform Infrared Spectroscopy has been combined with chemometrics to screen for the substitution of black pepper with papaya seeds, chili and with non-functional black pepper material such as black pepper husk, pinheads and defatted spent materials. A good separation performance between black pepper and adulterated samples could be shown. After running a binary classification model with an external test set an area under the receiver operator characteristic curve of 0.98 for both, the NIR and FT-IR model was obtained. This study shows the huge potential for a fast and rapid screening method that can be used to prove the authenticity of black pepper and detect adulterants.

General information
Publication status: Published
Organisations: National Food Institute, Research group for Analytical Food Chemistry, The Queen's University Belfast
Corresponding author: Wilde, A. S.
Pages: 1-7
Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: Food Control
Volume: 100
ISSN (Print): 0956-7135
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
Original language: English
Keywords: Black pepper, Authenticity, Adulteration, Fourier transform infrared, Near infrared, Screening method
DOIs:
10.1016/j.foodcont.2018.12.039
Source: FindIt
Source ID: 2442838472
Research output: Contribution to journal › Journal article – Annual report year: 2019 › Research › peer-review