

Food Chemistry

Omics analyses of potato plant materials using an improved one-class classification tool to identify aberrant compositional profiles in risk assessment procedures

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Abstract:

The objective of this study was to quantitatively assess potato omics profiles of new varieties for meaningful differences from analogous profiles of commercial varieties through the SIMCA one-class classification model. Analytical profiles of nine commercial potato varieties, eleven experimental potato varieties, one GM potato variety that had acquired Phytophthora resistance based on a single insert with potato-derived DNA sequences, and its non-GM commercial counterpart were generated. The ten conventional varieties were used to construct the one-class model. Omics profiles from experimental non-GM and GM varieties were assessed using the one-class SIMCA models. No potential unintended effects were identified in the case of the GM variety. The model showed that varieties that were genetically more distant from the commercial varieties were recognized as aberrant, highlighting its potential in determining whether additional evaluation is required for the risk assessment of materials produced from any breeding technique, including genetic modification.