

I'm not a robot

























The AOAC SMPR 2024.001 standard sets strict requirements for detecting pesticide residues in color additives from plant sources like turmeric, beet juice, and paprika. These ingredients often contain complex co-extractives that demand highly sensitive and selective analytical systems. Lab tests must utilize GC-MS/MS or LC-MS/MS methods with low detection limits, precise recoveries, and effective matrix interference control. The following instruments are compatible with AOAC SMPR 2024.001 for regulatory testing; the Agilent 7890B / 7010B Triple Quadrupole GC-MS/MS system, which excels at detecting non-polar pesticides; the Waters Xevo TQ-S Micro Triple Quadrupole LC-MS/MS system with ACQUITY I Class Front End, ideal for polar pesticides; and the PerkinElmer QSight 420 LC-MS/MS Triple Quad System with UHPLC. These instruments ensure reliable quantitation across diverse color additive matrices. Each platform meets the required limit of quantitation of 10 µg/kg or lower, with acceptable recovery (70-120%) and precision (RSDr ≤ 15%). They facilitate high-throughput analysis with accurate quantitation in complex matrices. The pursuit of precise pesticide residue analysis is a pressing concern in laboratories worldwide. To address this need, Shimadzu's TSQ 9000 GCMS-TQ8050 NX and SCIEX Triple Quad 6500+ LC-MS/MS systems offer unparalleled ultra-trace detection capabilities. These instruments boast advanced scheduling, automated method setup, and robust matrix interference handling, ensuring precise quantitation across multiple analytes. Confirmatory detection of acrylamide (AA) employs LC-MS/MS in SRM mode, with isotopic dilution utilized for quantification via labeled internal standards like 2,3,3-d3-acrylamide (d3-AA) or 13C3-2,3,3-d3-acrylamide (13C3-d3-AA). The validation process included 16 lab samples across nine matrix types, including coffee, infant cereal, cocoa powder, pet food, tea, spices, and nuts, showing recovery rates of 97-108% and precision metrics (RSDr and RSDIR) under 12%. Method applicability was confirmed through analysis of quality control and reference materials such as French fries, potato crisps, vegetable crisps, instant coffee, infant food, and biscuits, with accuracy within 94-107%. The method's performance aligns with SMPR 2022.006 standards, and the Expert Review Panel endorsed it as AOAC Official First Action 2023.01.