Application of NIR for Caffeine Analysis Development of a Global Calibration

H. GRAU[†], N. WARNE[1], S. PENSON[†]

[†]Kraft Foods, Research & Development, Ruscote Avenue, Banbury, Oxfordshire, OX16 2QU, UK
[1]Kraft Foods Sweden, Smebyvaegen 8, 19430 Upplands-Vasby, Sweden

SUMMARY

Near-Infrared Spectroscopy (NIRS) is a rapid analysis technique which has been widely applied in the food industry. Once calibrated, NIRS is robust and does not require skill operators for routine operation. Therefore, it is an ideal tool for QA departments when robustly calibrated versus the existing reference methods. However, development of robust calibrations often requires extensive analysis of a representative sample set, and can be the rate-limiting step in implementation. In addition, once developed, calibrations must be maintained to ensure reliable performance. In order to reduce the time required for development of NIRS calibrations for caffeine analysis in roast and ground coffee, a global calibration was developed, which can then quickly be applied at multiple locations/on multiple instruments. To assess the status in each location, a sample population of about about 50 samples (spread over the expected process and product variation and population) was analysed using the reference method and NIRS. Any outlier samples were added to the calibration, and the instrument was standardized against a reference instrument. Results indicate similar performance of the NIR analysis versus the reference test method in terms of reproducibility, precision and accuracy. The calibration will be maintained using a `centralized' approach.