

苹果内部品质近红外光谱检测的异常样本分析 Outlier Sample Analysis on Near Infrared Spectroscopy Determination for Apple Interior Quality

史波林 赵镭 刘文 汪厚银 朱大洲 尹京苑

上海大学

关键词: 苹果 无损检测 异常样本 近红外光谱

摘要: 应用声光可调谐滤波器近红外光谱仪检测苹果内部品质(可溶性固形物含量、总糖、总酸和硬度)时,综合利用Cook距离、马氏距离、杠杆值和学生化残差,判断疑似异常样本点,然后用二审剔除判别法确定异常样本点。最终可溶性固形物含量、总糖、总酸模型都剔除了11个异常样本,硬度模型剔除了6个异常样本。其偏最小二乘回归模型的相关系数分别从0.868、0.791、0.443、0.693提高到0.904、0.849、0.501、0.718,校正误差均方根(RMSEC)分别从 $0.882^{\circ}$  Brix、9.213g/L、0.805g/L、0.105MPa降低到 $0.733^{\circ}$  Brix、7.300g/L、0.687g/L、0.097MPa。所建的苹果各品质模型更加稳定,准确度更高。The interior quality of Shanxi 'Fuji' apple including soluble solid content (SSC), sugar content (SC), titrated acidity (TC) and firmness was determined by acousto-optic tunable filter (AOTF) near infrared (NIR) apparatus. The dubitable outlier samples were analyzed by Cook values, Mahalanobis, leverage and studentized residual. In order to avoiding falsely estimating outlier samples, twice-detection diagnosis method was applied to keep more valid samples. The estimated number of outlier samples for SSC, SC, TC and firmness were 11, 11, 11 and 6, respectively. After outlier samples elimination, the correlation coefficient ( $r$ ) of SSC, SC, TC and firmness models were improved from 0.868, 0.791, 0.443, 0.693 to 0.904, 0.849, 0.501, 0.718, respectively. The RMSEC of SSC, SC, TC and firmness were decreased from  $0.882^{\circ}$  Brix, 9.213g/L, 0.805g/L, 0.105MPa to  $0.733^{\circ}$  Brix, 7.300g/L, 0.687g/L, 0.097MPa, respectively. Moreover, the presented models of apple quality became more robust and stable.

[查看全文\(请使用Adobe Acrobat 6.0版本浏览\)](#) [返回首页](#)

[引用本文](#)