METASPEQ

Near-Infrared Spectroscopy

APPLICATION NOTE

Redefining Tea Quality Control with AI-driven NIR Spectroscopy

MetaspeQ near-infrared spectrometers, powered by AI/ML-driven **SpectraFind™**, offers a fast, accurate, and non-invasive solution for the quality assessment of fresh tea leaves by estimating total polyphenols making it ideal for real-time, in-situ quality control in the tea industry. By significantly reducing the time and cost of analysis, NIR technology is revolutionizing the way tea producers maintain quality and consistency in their products.



AT A GLANCE

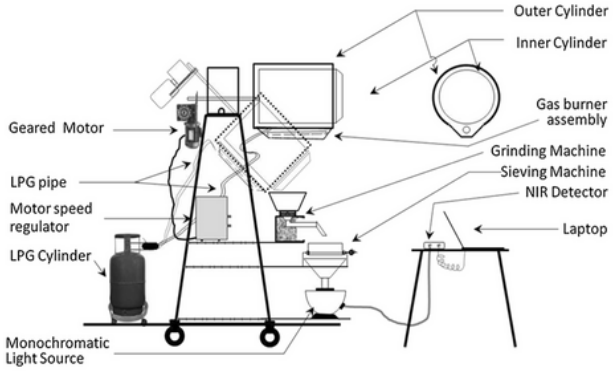
- **Technology**: MetaspeQ™ Near-Infrared Spectroscopy
- **Objective**: Fast and accurate assessment of ginger powder quality through NIR fingerprinting.
- **Industry**: Agricultural, Tea and Food Quality Control
- **Solution**: NIR spectroscopy for non-invasive real-time, in-situ quality control in the tea industry

Challenges

- Time-Consuming Traditional Methods
- Complex Data Interpretation
- Expensive,time-consuming testing with no portability

Benefits

- Rapid and Non-Destructive Testing
- Accurate and Reliable Quantification
- Cost-Effective Quality Control Solution
- Geographic Traceability



NEXT-GENERATION QUALITY ANALYSIS

OBJECTIVES

Estimate Total Polyphenol Content
Measure total polyphenol (TP) content in fresh tea leaves, an essential quality indicator for tea, using NIR spectroscopy.

Enhance Efficiency and Speed
Compare the speed and cost-efficiency of NIR technology to traditional chemical analysis, such as the Folin-Ciocalteu method, for real-time tea leaf quality assessment.

SOLUTIONS

MetaspeQ for Polyphenol Measurement
NIR technology offers a non-destructive and rapid solution for estimating polyphenol content in fresh tea leaves

Onsite and In-Situ Application
An integrated NIR-based system was developed for real-time assessment of fresh tea leaves, capable of performing onsite drying, grinding, sieving, and polyphenol measurement within 20 minutes, making it suitable for immediate quality control at tea factories

BENEFITS

Rapid and Non-Destructive Testing : NIR spectroscopy eliminates the need for complex chemical processes, providing an instant, non-destructive solution for tea quality assessment.

Sustainability in Tea Production: The ability to assess tea quality without destructive chemical methods promotes sustainability, reducing waste and improving resource efficiency throughout the production process.

Cost-Effective and Time-Efficient: Compared to traditional methods, NIR significantly reduces the time required for analysis while cutting costs by eliminating the need for reagents and skilled chemical analysis.