An approach towards the evaluation of quality attributes of black tea samples: Implementation of a NIR-Spectroscopy based technique

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To assure the quality and economy of black tea, its quality attributes are frequently checked before it is bought, blended, and marketed. Although some of these quality attributes may be measured analytically, others must be evaluated as sensory scores as a result of cupping tests undertaken by tea professionals. However, most of these assessments (particularly sensory ones) need experience and training, require time, and are open to human mistakes. Addressing these reasons, non-destructive spectral sensors were combined with chemometric methods in this study to examine the feasibility of rapid measurement of the cupping test scores for appearance, body, colour, and overall quality, as well as some other important sensory-related quality attributes (bulk density, cellulose, water extract, and moisture) of black tea samples. As regression techniques, Partial Least Squares Regression and Principal Components Regression with stepwise variable elimination were utilised, and three separate spectrum instruments were used. The findings show that Partial Least Squares Regression combined with FT-NIR technology may be promising for the quick and cost-effective evaluation of sensory scores and associated attributes for usage in the tea industry.

**Keywords:** black tea, cupping, sensory, blend

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