ASSESSMENT OF BISCUIT MOISTURE AND BISCUIT BROWNING

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A fast, non-destructive, versatile method for assessing biscuit quality is presented. The method integrates color (or browning) and moisture assessment with dimensional measurements. In the quality control function of biscuit production this information is important to optimize production processes and to assure quality of the final product.

Spectral imaging and analysis of one biscuit is done in a few seconds. The imaging system, VideometerLab (www.videometer.com) captures 18 high resolution spectral images in the range 400-1000 nm. Acquisition is band-sequential and performed by LED strobing into an integrating sphere illumination geometry. The spectral image will contain a NIST calibrated reflectance spectrum in every pixel.

Biscuit color is estimated either in CIELAB coordinates, or as a browning index. Both representations may be estimated in both the biscuit center region and in the edge/corner region. CIELAB coordinates are spectrally reconstructed from the reflectance spectra, and the baking index is constructed using a normalized canonical discriminant analysis.

A biscuit moisture model has been built on regional spectral imaging features through stepwise feature selection and linear regression towards conventional weight moisture measurements. The data set includes biscuits from different lines and both hot and cooled biscuits. Within the relevant humidity range 1%-3% we obtain a RMSEP of 0.14%.

Dimensional measurements relates to the packaging of the biscuits and consist of height and lateral dimensions, e.g. length and width, and height.

References

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