Milled industrial beet color kinetics and total soluble solid contents by image analysis

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Industrial beets could be used for biofuels and bioproducts production. However, there is a need to assess the quality of juice and pulp from the beets as they are being processed. A computer vision system using a digital camera, custom-design enclosure, and color calibration method was developed to measure color changes that happen after beets have been pulverized for juice extraction.
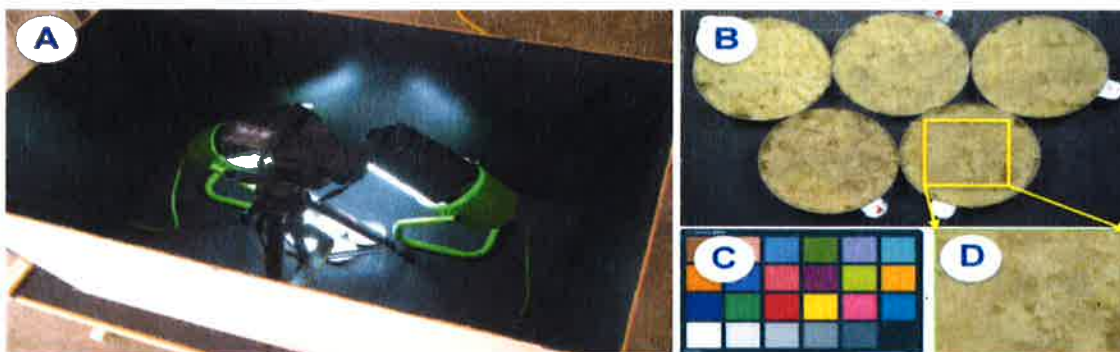

Figure 1. Custom-designed computer vision system (CCVS) for measuring the color kinetics of milled industrial beet samples and color calibration: (A) CCVS showing digital camera, illumination, and black enclosure; (B) one set of measurement.five samples used for color measurement; (C) ColorChecker (X-rite) with 24 color squares, used for color calibration; and (D) example automatic cropped image of sample for color.

These color changes were then used to predict industrial beet sugar content. The color measurements and mathematical model where shown to provide a good estimate of industrial beet sugar content.

The computer vision system and model provides a valuable tool for processors to monitor the quality and serves an alternative method for measuring sugar content while processing beets for renewable fuels and bioproducts production.
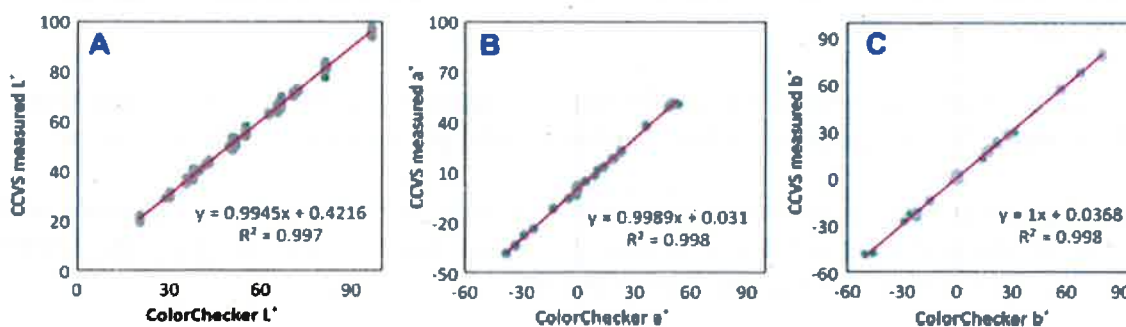

Figure 2. Comparison of L* a* b* values evaluated by custom-designed computer vision system and standard L* a* b* values of the ColorChecker (X-rite).

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http://www.sciencedirect.com/science/article/pii/S0926669014007663