

**Title** Portable hyperspectral imaging device for surface sanitation verification in the produce industry

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### **Abstract**

Produce processors must clean and sanitize surfaces before production to reduce the risk of foodborne illness. Current surface hygiene verification methods require direct surface sub-sampling at selected locations and a wait time. To augment these methods, a portable hyperspectral imaging device was developed to find potential contaminants in real-time and increase sub-sampling effectiveness. Analysis of hyperspectral fluorescence images showed that fresh-cut produce processing exudates in the regions of 460-540 and 670-680 nm are detectable from background materials, while select cleaning agents are not. The portable single operator imaging system includes a charge coupled device (CCD) camera, tunable optical filter, laptop, light emitting diodes (LED's) for fluorescence excitation, and a touchscreen display. Within a commercial plant, fluorescence imaging identified produce processing residuals following routine cleaning procedures that were not readily visible to the naked eye. These tests demonstrate the system's potential to enhance post-cleaning inspection, and helped improve routine cleaning procedures.