

Title Fluorescence imaging with UV-excitation for evaluating freshness of rice
Author Hachiya M., Asanome N., Goto T. and Noda T.
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Abstract

To measure the freshness of rice quickly and conveniently, we used a fluorescence imaging method with UV-excitation. The system consists of two UV-A fluorescent lamps and a blue LED with a band-pass filter, a cooled CCD camera with an IR cutoff filter to capture the fluorescence image on a PC, and image processing software for measuring the fluorescence intensity of the image. In a darkened box, sample materials are placed on a stage painted with non-fluorescent, flat black paint to minimize background scattering. Testing stored samples of unhulled rice and brown rice, we found a high correlation between the fluorescence intensity and conventional indices such as free fat acidity and guaiacol reaction. The fluorescence intensity increased as the storage temperature rose or the storage period lengthened. Eating quality decreased significantly as the fluorescence intensity rose. These results show that this system can estimate the loss of eating quality that occurs during storage of rice. Thus, fluorescence intensity could provide an effective and convenient way to evaluate rice quality.