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## Modification of the Potassium Ferricyanide Reducing Sugar Test for Sugars from Extracts of Cotton Fiber

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Authors: Donald E. Brushwood

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*Molecular Biology and Physiology*[Full Text PDF](#) (99K)

For many years the potassium ferricyanide ( $K_3Fe[CN]_6$ ) standard sugar test-also known as the Perkins test-has been used by the textile industry to quantify the content of sticky sugars on cotton (*Gossypium hirsutum* L.) lint. This test, however, is a reducing sugar test and does not detect non-reducing sugars, which are known to contribute to the stickiness potential of the lint. Hence, poor correlations are often found between potassium ferricyanide sugar-test results and physical stickiness ratings, such as sticky-cotton thermodetector and minicard measurements. This lack of detection is particularly true of cotton lint contaminated with aphid (*Aphis* spp.) honeydew. This study was designed to determine whether some of the nonreducing sugars extracted from cotton lint could be converted to reducing sugars prior to the potassium ferricyanide sugar test. Treatment with a mild (0.2 M) sulfuric acid solution converted sucrose (a physiological sugar) and melezitose (an insect-honeydew sugar) to reducing sugars that are detectable by the standard potassium ferricyanide test. Complete conversion of these sugars was verified by use of high performance liquid chromatography (HPLC). The modified potassium ferricyanide sugar test provided a more realistic quantification of sugars present, and the difference between standard and modified sugars was directly proportional to the amount of sucrose and melezitose present. Our modified potassium ferricyanide test did not substantially enhance the correlation between measured sugar content and predicted sticky-cottonthermodetector stickiness potential for non-honeydew and whitefly-honeydew (*Bemesia* spp.) contaminated cotton. But, correlations between sugar content and sticky-cotton-thermodetector stickiness for cotton lint contaminated by aphid-honeydew were improved by at least 20%.