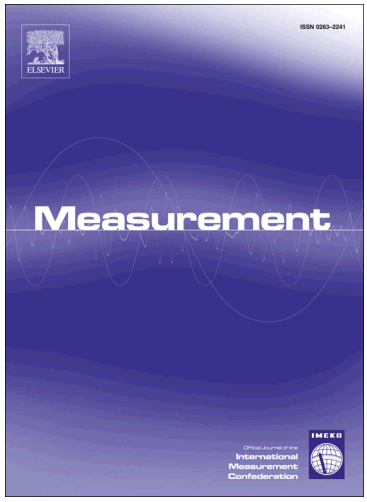

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Measurement and analysis of fluorescent whitening agent content in soybean milk based on image techniques

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Abstract

This paper presents a method for measuring and quantitatively analyzing the fluorescent whitening agent in soybean milk based on image techniques. After collecting the fluorescent images of the soybean milk samples, the top seven wavelet moment invariants are selected according to the sample training and experimental comparison. Then calculate the standard templates of the 49 classes of calibration samples with different fluorescent whitening agent content ranging from 0.02mg/ml to 0.5mg/ml. The minimum distance method is carried out to match the testing sample with the calibration template, which realizes the quantitative analysis. To verify the effectiveness of the presented method, the prediction experiment is carried out. Results show that the absolute errors are within 0.005mg/ml and the relative errors are within 5%, which means this method can measure the fluorescent whitening agent in soybean milk. This research presents a new approach for detecting the illegal fluorescence additive in food production.

Keywords

quantitative analysis; wavelet moment invariant; image techniques

1 Introduction

Food has a vital significance for the development of human health, and the food composition is directly related to the food safety. With the development of science technology and the environmental deterioration, food safety directly threatens our health and social harmony.

Yuba is the traditional soybean product in China. It is a layer of film in the process of cooling the boiled soybean milk. Yuba has the same high nutrition as soybean, and can be easily digested by our bodies[1]. The soybean milk products such as Yuba have won good graces of more and more people. However, the quality problems of these products are becoming more and more serious. Recent years, a lot of countries paid more attention on food safety and strengthen the management of illegal additives abuse in Yuba. However, in order to reduce the cost, some manufacturers use the fluorescent whitening agent(FWA) in soybean milk to make Yuba whiter. Results showed that excess intake of these toxic and harmful additives