conferenceseries.com
6th International Conference on
FOOD SAFETY & REGULATORY MEASURES
June 05-07, 2017 Milan, Italy

J Food Microbiol Saf Hyg 2017, 2:2 (Suppl)
DOI: 10.4172/2476-2059-C1-003

Development of automatic sesame grain grading system using image processing techniques

Hiwot Desta Alemayehu
Addis Ababa University, Ethiopia

Sesame is one of the most ancient oil crop adapted to tropic and semi-tropic areas around the world. It is possible to identify, classify and grade agricultural products with a human operator but they are usually inconsistent, tiring, biased, error prone and inefficient. Seed analysis using digital image processing is becoming increasingly important for quality control in seed production. Digital image processing along with classification and neural network algorithms has enabled grading of various agricultural products. Sorting and grading of an agricultural and food product are done based on the physical appearance of the seeds, for example texture, color, shape or size. A computer-vision application using image processing techniques involves five basic processes such as image acquisition, preprocessing, segmentation, object detection and classification. In view of this, the goal of this research work is to develop a system capable of grading sesame sample constituents using digital image processing techniques and artificial neural network classifier based on the standard for sesame set by the quality and standards authority. On the average, 42 images were taken from each of the two varieties (humera sesame and wellega sesame). Grades 1–5 of the sesame grain were available, providing a total of 208, containing 3408 sesame seeds. An appropriate segmentation technique is used to segment and lay the foundation for feature extraction. Area, perimeter, major and minor axes lengths, aspect ratio, elongation, compactness, equivalent diameter and roundness are some of the most commonly measured morphological features. A total of 22 features (eight colors, 10 morphological and four textures) have been identified to model sesame sample constituents. For classification of sesame samples, a feed forward artificial neural network classifier with back propagation learning algorithm, 22 input and five output nodes, corresponding to the number of features and classes respectively has been designed. Quantitatively, an average accuracy of 97.1% is achieved for both sesame grain varieties with the combined feature sets of morphology, color and texture using the ANN. This shows a promising result to design an applicable sesame grain grading system.

Hiwidesta7@gmail.com

Notes: