Detection of Concealed Damage in Raw Nuts

Tech ID: 27329 / UC Case 2017-082-0

ABSTRACT

Researchers at the University of California, Davis have developed a nondestructive method for identifying raw nuts with concealed damage.

FULL DESCRIPTION

Concealed damage (CD) is a brown discoloration of nutmeat that appears after raw nuts are treated with heat. CD is frequently associated with bitter flavor and results in immediate consumer rejection. It significantly affects the quality of harvested nuts and reduces grower returns in subsequent years. Currently, there are no screening methods available to detect CD in raw nuts.

Researchers at the University of California, Davis have developed a nondestructive method for identifying raw nuts with CD. The method employs Near-Infrared Spectroscopy (NIR) at selected wavelength ranges to generate a discriminant analysis model. The model can be applied to an automated sorting system to rapidly identify raw nuts with CD prior to roasting. These method can be used to establish thresholds for the specific kernel moisture content, temperature, and the various time and storage management scenarios to improve quality of the nuts and improve grower returns. The method has already been tested and confirmed in raw almonds and can be extended to other CD afflicted raw nuts including macadamia nuts, walnuts, chestnuts, hazelnuts, and soybean seeds.

APPLICATIONS

- Identifying raw nuts with concealed damage
- Rapid in-line screening
- Identifying factors that promote CD

FEATURES/BENEFITS

- Nondestructive
- Minimize immediate consumer rejection
- Not labor intensive
- Identify nuts with CD prior to heat treatment
- Saves time and money
- Improved quality control

RELATED MATERIALS

- Use of Near-Infrared Spectroscopy and Chemometrics for the Nondestructive Identification of Concealed Damage in Raw Almonds (Prunus dulcis). Cristian Rogel-Castillo, Roger Boulton, Arunwong Opastpongkarn, Guangwei Huang, and Alyson E. Mitchell. Journal of Agricultural and Food Chemistry 2016 64 (29), 5958-5962. DOI: 10.1021/acs.jafc.6b01828 -

CONTACT

Victor Haroldsen
haroldsen@ucdavis.edu
tel: 530-752-7717.

INVENTORS

- Mitchell, Alyson E.
- Rogel-Castillo, Cristian

OTHER INFORMATION

KEYWORDS

near-infrared spectroscopy, concealed damage, raw nuts, chemometrics, discriminant analysis

CATEGORIZED AS

- **Agriculture & Animal Science**
  - Other
  - Processing and Packaging
- **Sensors & Instrumentation**
  - Other

RELATED CASES

2017-082-0

07/27/2016

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,712,326	07/14/2020	2017-082

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Method for Debittering Olives and Production of Olive Abstracts Enriched with Polyphenolic Constituents

University of California, Davis
Technology Transfer Office
1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

Tel:
530.754.8649
techtransfer@ucdavis.edu
https://research.ucdavis.edu/technology-transfer/
Fax:
530.754.7620