NRZ-Authent „Journalscanner“

Ausgabe Nr. 4 (Feb. 2020)

In diesem Dokument finden Sie Hinweise auf neu erschienene wissenschaftliche Aufsätze bzw. Journalbeiträge aus den Themenbereichen Lebensmittelauthentizität/Food Fraud/Food Crime, die für die Mitglieder der FIS-VL Site „NRZ Authent“ fachlich interessant sein können.

Bitte beachten Sie, dass der vorliegende „Journalscanner“ *nicht* den Anspruch hat, einen vollständigen Literaturüberblick oder „Scan“ aller die Themen Lebensmittelauthentizität/Food Fraud/Food Crime betreffenden wissenschaftlichen Journals zu bieten – er versteht sich allein als eine Zusammenstellung von ausgewählten wissenschaftlichen Leseempfehlungen, die in einem ca. vierteljährlichen Rhythmus bei den Fachkolleginnen und -kollegen des Arbeitskreises Lebensmittelauthentizität am MRI sowie im NRZ-Authent abgefragt werden.

Aus Copyrightgründen legen wir nur den Titel, die Autoren, das vom jeweiligen Verlag angegebene Abstract und ggf. die gefundenen Keywords/Schlagwörter bei. Mittels der nun auch vorhandenen DOI-Nummer gelangen Sie ggf. direkt zum jeweiligen Volltext *sofern* Ihre Institution einen entsprechenden online-Zugang für das jeweilige Journal oder den Verlag hat.

Wir bedanken uns sehr bei allen Tippgeberinnen und Tippgebern! Wenn Sie möchten, sind Sie herzlich eingeladen, zu den Leseempfehlungen beizutragen: hierzu bitte einfach eine E-Mail mit dem Artikel- oder Veranstaltungshinweis an NRZ@mri.bund.de - Danke.

I. Konferenz- und Workshophinweise:

a. In eigener Sache:

1. **Kleiner Fachworkshop „Stabilisotopen“** am 17.06.2020, 10-16 Uhr am MRI Karlsruhe
   Das Programm (Panels und Vorträge) wird online über FIS-VL sowie in einer späteren Ausgabe bekannt gegeben werden. Anmeldungen sind ab 10. März 2020 möglich unter: NRZ@mri.bund.de

2. **4. NRZ-Authent Expertinnen- und Expertenworkshop**, 24.-25.11.2020 (lunch-to-lunch) am MRI Karlsruhe
   Das Programm (Themenschwerpunkte/Panels) wird in einer späteren Ausgabe bekannt gegeben.

b. Weitere Tagungen, Konferenzen, Workshops etc.:

3. **Treffen der jeweiligen Regionalverbände der Lebensmittelchemischen Gesellschaft (LChG) der Gesellschaft Deutscher Chemiker (GDCh**)
   https://www.gdch.de/netzwerk-strukturen/fachstrukturen/lebensmittelchemische-gesellschaft/regionalverbaende.html

4. **International Conference Series on Environmental and Food Monitoring (ISEAC 41)**, 07.-11.09.2020, Regensburg
   http://www.iseac-conferences.org/index.php/scientific-program/topics

5. **49. Deutscher Lebensmittelchemikertag,** 14.-16.09.2020, Wuppertal
   https://veranstaltungen.gdch.de/tms/frontend/index.cfm?l=9525&sp_id=1

6. **61. Arbeitstagung des Arbeitsgebietes Lebensmittelsicherheit und Verbraucherschutz 2020**; 29.9-2.10.2020, Garmisch-Partenkirchen
   https://www.dvg.net/index.php?id=2416&contUid=0#c5135

7. **4. LGL Kongress Lebensmittelsicherheit und Tiergesundheit,** 14. bis 16. Oktober 2020 in Erlangen
   https://www.lgl.bayern.de/aus_fort_weiterbildung/veranstaltungen/kongresse_veranstaltungen/2020_kongress_lm_sicherheit_tiergesundheit.htm

II. Artikelhinweise von Expertinnen und Experten:

1. **Tae SunKang (2019). Basic principles for developing real-time PCR methods used in food analysis: A review, Trends in Food Science & Technology, Volume 91, September 2019, Pages 574-585**

DOI-number: https://doi.org/10.1016/j.tifs.2019.07.037

Abstract: This review summarizes and assesses different methods presented throughout a large number of scientific papers, including DNA extraction, primer design, and quantification (or qualification) as well as parameters for the development and validation of real-time PCR methods in food analysis. Inhibitors in DNA extracts can cause decreased PCR sensitivity and false negative results; thus, the use of PCR inhibition and amplification controls (e.g., the 18S ribosomal RNA gene) is essential for obtaining accurate real-time PCR results. In quantitative real-time PCR methods, the results obtained using species-specific systems need to be normalized by using reference systems for the improvement of their accuracy. Therefore, this review will provide researchers with a beneficial guide for the development of real-time PCR methods in a harmonious manner and contribute to an enhanced applicability of the methods developed.

Keywords: Real-time PCR, Food analysis, Species identification, Method acceptance parameters, PCR inhibition, PCR amplification control

2. **Sören Lukas Hellmann, Fabian Ripp, Sven-Erno Bikar, Bertil Schmidt, Rene Köppel, Thomas Hankeln (2019). Identification and quantification of meat product ingredients, European Food Research and Technology, Received: 2 September 2019 / Accepted: 2 November 2019**

DOI-number: https://doi.org/10.1007/s00217-019-03404-y

Abstract: Complex food matrices bear the risk of intentional or accidental admixture of non declared species. Moreover, declared components can be present in false proportions, since expensive taxa might be exchanged for cheaper ones. We have previously reported that PCR-free metagenomic sequencing of total DNA extracted from sausage samples combined with bioinformatic analysis (termed All-Food-Seq, AFS) can be a valuable screening tool to identify the taxon composition of food ingredients. Here, we illustrate this principle by analysing regional Doner kebap samples, which revealed unexpected and unlabelled poultry and plant components in three of five cases. In addition, we systematically apply AFS to a broad set of reference meat material of known composition (i.e. reference sausages) to evaluate quantification accuracy and potential limitations. We include a detailed analysis of the effect of different food matrices and the possibility of false-positive sequence read assignment to closely related species, and we compare AFS quantification results to quantitative real-time PCR (qPCR) and droplet digital PCR (ddPCR). AFS emerges as a

potent PCR-free screening tool, which can detect multiple target species of differentkingdoms of life within a single assay. Mathematical calibration accounting for pronounced matrix effects can significantly improve AFS quantification accuracy. In comparison, AFS performs better than classical qPCR, and is on par with ddPCR.

Keywords: Food metagenomics, Species identification, Doner Kebap, Read mapping, Next-generation-sequencing

3. Szabo, K., Malorny, B., Stoyke, M. (2020). Etablierung der § 64 LFGB Arbeitsgruppen „NGS – Bakteriencharakterisierung“ und „NGS – Speziesidentifizierung“. J Consum Prot Food Saf 15, 85–89

DOI-number: https://doi.org/10.1007/s00003-019-01255-z

Abstract: Das Next-Generation Sequencing (NGS) besitzt großes Potential im Bereich der Lebensmittelsicherheit und der Authentizitätsprüfung von Lebensmitteln. Die Gesamtgenomsequenzierung mikrobieller Genome kombiniert mit bioinformatischen Auswerteprogrammen ersetzt zunehmend die klassischen Typisierungsmethoden und gilt aufgrund ihres außerordentlichen Auflösungsvermögen mittlerweile als Methode der Wahl im Rahmen von Ausbruchsuntersuchungen. Zur Authentizitätskontrolle z. B. von Fleisch- und Fischproben finden NGS-Methoden als Metabarcoding immer häufiger Anwendung, um Täuschung und Irreführung bis hin zu Lebensmittelbetrug aufzudecken. Einige Untersuchungsbehörden verfügen bereits über die NGS-Technologie und setzen diese auch erfolgreich ein, weitere Einrichtungen werden folgen. Um den mit der Lebensmittelüberwachung betrauten Behörden validierte, leistungsfähige und standardisierte NGS-Methoden zur Verfügung zu stellen, ist eine Aufnahme dieser Methoden in die „Amtliche Sammlung von Verfahren zur Probenahme und Untersuchung von Lebensmitteln“ (ASU) durch die Gründung zweier neuer § 64 LFGB Arbeitsgruppen mit unterschiedlichen thematischen Schwerpunkten vorgesehen. Die Arbeitsgruppe „NGS – Bakteriencharakterisierung“ bearbeitet NGS-Verfahren für die Sequenzierung bakterieller Erreger im Rahmen von Ausbruchsuntersuchungen. Die Arbeitsgruppe „NGS – Speziesidentifizierung“ beschäftigt sich mit NGS-Methoden zur Tierartendifferenzierung in Lebensmitteln. Am 6. März 2019 fand das erste Treffen der Arbeitsgruppe „NGS – Speziesidentifizierung“ und am folgenden Tag, dem 7. März 2019 das der Arbeitsgruppe „NGS – Bakteriencharakterisierung“ auf Einladung des Bundesamts für Verbraucherschutz und Lebensmittelsicherheit (BVL) in Berlin statt. Auf den Sitzungen wurden durch die Mitglieder der Gruppen NGS-Methoden zur Bakteriencharakterisierung bzw. zur Tierartendifferenzierung in Lebensmitteln vorgestellt. Anschließend diskutierten die Mitglieder die ersten thematischen Schwerpunkte der Methodenentwicklung, Validierungskonzepte, Qualitätskontrollmaßnahmen und den Einsatz dieser Methoden in der Lebensmittelüberwachung. Es wurde beschlossen, durch laborübergreifende Vorringversuche die Vergleichbarkeit der verschiedenen NGS-Technologien zu ermitteln sowie die entsprechenden Auswerteparameter, Qualitätskriterien und Validierungsparameter für eine laborübergreifende Validierungsstudie zu erarbeiten.

Keywords: keine zur Verfügung gestellt

4. **Kappel, K., Eschbach, E., Fischer, M., Fritsche, J. (2020). Design of a user-friendly and rapid DNA microarray assay for the authentication of ten important food fish species. Food Chemistry, 125884**

DOI-number: 10.1016/j.foodchem.2019.125884

Abstract: Seafood is particularly susceptible to the substitution of species. In order to guarantee authentic seafood products, seafood processors and traders must perform self-checks on the authenticity of imported and purchased goods. However, the conventional Sanger sequencing of PCR products for the authentication of seafood species is time-consuming and requires advanced infrastructure. DNA microarrays (DNA chips) with species-specific oligonucleotide probes represent a rapid alternative to sequencing-based species authentication. So far, though, only DNA microarrays for the authentication of land vertebrate species have achieved market success. In this work, a user-friendly DNA microarray assay was developed for the authentication of ten important food fish species that can be performed in four to five hours from start to end. The assay was tested with authenticated specimens from 67 different fish species, and by comparing the probe signal patterns all target species and even closely related non-target species could be distinguished.

Keywords: Authenticity; DNA chip; DNA microarray; Fish species; Food fraud

5. **Salzano, A., Manganiello, G., Neglia, G., Vinale, F., De Nicola, D., D'Occhio, M., & Campanile, G. (2020). A Preliminary Study on Metabolome Profiles of Buffalo Milk and Corresponding Mozzarella Cheese: Safeguarding the Authenticity and Traceability of Protected Status Buffalo Dairy Products. Molecules, 25(2), 304.**

DOI-number: über researchgate ist der PDF-download des Volltextes möglich

Abstract: The aim of this study is to combine advanced GC-MS and metabolite identification in a robust and repeatable technology platform to characterize the metabolome of buffalo milk and mozzarella cheese. The study utilized eleven dairies located in a protected designation of origin (PDO) region and nine dairies located in non-PDO region in Italy. Samples of raw milk (100 mL) and mozzarella cheese (100 g) were obtained from each dairy. A total of 185 metabolites were consistently detected in both milk and mozzarella cheese. The PLS-DA score plots clearly differentiated PDO and non-PDO milk and mozzarella samples. For milk samples, it was possible to divide metabolites into two classes according to region: those with lower concentrations in PDO samples (galactopyranoside, hydroxybuthyric acid, allose, citric acid) and those with lower concentrations in non-PDO samples (talopyranose, pantothenic acid, mannobiose, etc.,). The same was observed for mozzarella samples with the proportion of some metabolites (talopyranose, 2, 3-dihydroxypropyl icosanoate, etc.,) higher in PDO samples while others (tagatose, lactic acid dimer, ribitol, etc.,) higher in non-PDO samples. The findings establish the utility of GC-MS together with mass spectral libraries as a powerful technology platform to determine the authenticity, and create market protection, for "Mozzarella di Bufala Campana."

Keywords: metabolome; GC-MS; buffalo; milk; mozzarella; authenticity

6. **Zhang, Xufeng, Han, Deming, Chen, Xiaojia, Zhao, Xinda, Cheng, Jinping, Liu, Yu (2020). Combined use of fatty acid profile and fatty acid δ13C fingerprinting for origin traceability of scallops (Patinopecten yessoensis, Chlamys farreri, and Argopecten irradians), Food chemistry 2019 v.298 pp. 124966**

DOI-number: https://doi.org/10.1016/j.foodchem.2019.124966

Abstract: The aim of this study was to evaluate the combination of fatty acid profile and fatty acid $\delta^{13}C$ fingerprinting to identify the origins of scallops. Fatty acid contents, as well as fatty acid $\delta^{13}C$ values of 300 samples of three scallop species (*Patinopecten yessoensis*, *Chlamys farreri*, and *Argopecten irradians*) from seven sites in China were determined. Principal component analysis was performed on datasets to evaluate their performance of classification. Moreover, 75 samples were tested by discrimination analysis to estimate the accuracy of origin prediction. The results show that the accuracy rate of fatty acid profile and fatty acid $\delta^{13}C$ fingerprinting for origin prediction was 92% and 85.3%, respectively. The combination of these two methods improved the identification, with an accuracy rate of 100.0%. These results indicate that the combination of fatty acid profile and fatty acid $\delta^{13}C$ fingerprinting can be a precise and promising tool for origin traceability of scallops.

Keywords: Bivalve, Fatty acid profile, Fatty acid $\delta^{13}C$ fingerprinting, CSIA, Traceability, Authentication, GC-C-IRMS, Food quality

7. **Novak, Vlastimil, Adler, Josefine, Husted, Søren, Fromberg, Arvid, Laursen, Kristian Holst (2019). Authenticity testing of organically grown vegetables by stable isotope ratio analysis of oxygen in plant-derived sulphate, Food chemistry 2019 v.291 pp. 59-67**

DOI-number: https://dx.doi.org/10.1016/j.foodchem.2019.03.125

Abstract: Analytical methods for authenticity testing of organically grown vegetables are urgently needed. Here we present a novel method for organic authentication based on stable isotope ratio analysis of oxygen in plant-derived sulphate. We combined this method with stable isotope ratio analysis of bulk plant tissue and plant-derived nitrate to discriminate organic and conventional potato, carrot, and cabbage from rigidly controlled long-term field trials and from a case study using retail potatoes. It was shown that oxygen isotope ratios of sulphate from organic vegetables were significantly lower compared to their conventional counterparts and the values were directly linked to the fertilisation strategy. The classification power of sulphate isotope analysis was superior compared to known bulk tissue isotope markers and nitrate isotope values. In conclusion, oxygen isotope analysis of plant-derived sulphate represents a promising new method for authentication of organic vegetables.

Keywords: analytical methods, cabbage, carrots, case studies, field experimentation, nitrates, organic foods, organic production, oxygen, plant tissues, potatoes, stable isotopes, sulfates

8. Boughattas, F., Le Fur, B, Karoui, R. (2019). Non-Targeted Identification of Brine Covered Canned Tuna Species Using Front-Face Fluorescence Spectroscopy Combined with Chemometric Tools. Food Analytical Methods, 12: 2823-2834

DOI-number: https://doi.org/10.1007/s12161-019-01638-w

Abstract: The most common frauds of tuna cans supply chain concern the substitution or mixing of valuable tuna species with cheaper ones, which is strictly forbidden. The objective of the present study was to determine the potential use of front-face fluorescence spectroscopy (FFFS) as a rapid tool to authenticate species in canned tuna: skipjack tuna (Katsuwonus pelamis), yellowfin tuna (Thunnus albacares), Albacore tuna (Thunnus alalunga), and bigeye tuna (Thunnus obesus). Different spectra (tryptophan residues, aromatic amino acids, and nucleic acids (AAA + NA), riboflavin, nicotinamide adenine dinucleotide (NADH), and vitamin A) were recorded on 256 canned tunas, produced at the pilot scale, that were used for the establishment of models. The robustness of the established models was tested on 40 commercial canned tunas. According to the label tunas, the percentage of correct classification reached 75% allowing us to conclude that FFFS may represent a promising tool to be used by both canning industry and governmental control agencies to ascertain correct labeling of canned tuna.

Keywords: Fluorescence, Identification, Bigeye tuna, Yellowfin tuna, Skipjack tuna, Albacore tuna

9. Strateva, M. & Penchev, G. (2019). Histological Discrimination of fresh from frozen /thawed carp (Cyprinus carpio). Bulgarian Journal of Veterinary Medicine, online first

DOI-number: 10.15547/bjvm.2019-0113 ; http://tru.uni-sz.bg/bjvm/2019-0113%20OnFirst.pdf

Abstract: The aim of the study was to perform histological differentiation of dorsal and ventral musculature of fresh and frozen/thawed carps (Cyprinus carpio). Histological findings of muscle fibres (Myofibra striata) of fresh carps did not show any changes. Single freezing at –10 ºC resulted in extracellular gaps in the central part of some of fibres. After single freezing at –18 ºC, muscle fibres with cell destruction in the central part were identified while the periphery remained intact. Completely destructured and deformed areas of muscle fibres were demonstrated after single freezing at –27 ºC. Double freezing at –10 ºC resulted in shrinkage, extracellular gaps and fragmentation of fibres, while muscle fibres double-frozen at –18 ºC were impaired, degraded and with visible defects. The histological findings in carp muscle, double-frozen at –27 ºC comprised severely deformed muscle fibres with increased extracellular gaps from

degraded muscle tissue. On the basis of findings, it could be concluded that double freezing of carps was not an appropriate method of storage and shelf-life extension.

Keywords: carps, dorsal muscle, freezing, histological changes, skeletal muscle fibres, ventral muscle

III. Veröffentlichungsliste von peer-reviewten Artikeln im Zeitraum seit der letzten Ausgabe

- Im Zeitraum der letzten (dritten) bis zur heutigen (vierten) Ausgabe ergab die Web-of-Science Abfrage eine Veröffentlichung von insgesamt **88 peer-reviewten wissenschaftlichen Journalbeiträgen**
- Maßgeblich war die Datumsangabe in der Rubrik "published"
- Die vorgenommene Abfrage war: "You searched for: TOPIC**:** (**Food fraud** OR **Food crime** OR **food authenticity**)"
- Das Abfragedatum [Ende] war: 26. Feb. 2020
- Als Datum der letzten Ausgabe des NRZ-Journalscanners [Beginn] wurde der 1. Nov. 2019 gesetzt
- Die Liste wurde mit Hilfe von **Web of Science** erstellt; einem kostenpflichtigen Angebot mit mehreren wissenschaftlichen Online Zitations- und Literaturdatenbanken, das Clarivate Analytics gehört.
- Die Zielgruppe dieser Liste ist eingeschränkt. **Die Liste darf nicht an Dritte weitergegeben werden** und ist nur intern, d. h. hier in der FIS-VL Site „NRZ Authent" für deren Mitglieder zugänglich. Darüber hinaus dürfen die folgenden Informationen **nur für interne wissenschaftliche Zwecke** genutzt werden.

1.
Targeted metabolomics to assess the authenticity of bakery products containing chia, sesame and flax seeds
By: Brigante, Federico, I; Lucini Mas, Agustin; Pigni, Natalia B.; et al.
FOOD CHEMISTRY Volume: 312 Article Number: 126059 Published: MAY 15 2020

2.
Tracing the geographical origin of rice by stable isotopic analyses combined with chemometrics
By: Wang, Jishi; Chen, Tianjin; Zhang, Weixing; et al.
FOOD CHEMISTRY Volume: 313 Article Number: 126093 Published: MAY 2020

3.
Design of a user-friendly and rapid DNA microarray assay for the authentication of ten important food fish species
By: Kappel, Kristina; Eschbach, Erik; Fischer, Markus; et al.
FOOD CHEMISTRY Volume: 311 Article Number: 125884 Published: MAY 1 2020

4.
Application of multi-element (C, N, H, O) stable isotope ratio analysis for the traceability of milk samples from China
By: Zhao, Shanshan; Zhao, Yan; Rogers, Karyne M.; et al.
FOOD CHEMISTRY Volume: 310 Article Number: 125826 Published: APR 25 2020

5.
Exploration of a new consumer test method based on metacognitive certainty
By: Kim, In-Ah; Cho, Ha-Yeon; Hautus, Michael J.; et al.
FOOD QUALITY AND PREFERENCE Volume: 81 Article Number: 103857 Published: APR 2020

6.
Study of the lightfastness properties of prints on blister foils by spectral reflectance
By: Mandal, Mahasweta; Bandyopadhyay, Swati
COLOR RESEARCH AND APPLICATION Volume: 45 Issue: 2 Pages: 336-344 Published: APR 2020

7.
Multiblock chemometrics for the discrimination of three extra virgin olive oil varieties
By: Malechaux, Astrid; Laroussi-Mezghani, Sonda; Le Dreau, Yveline; et al.
FOOD CHEMISTRY Volume: 309 Article Number: 125588 Published: MAR 20 2020

8.
Rapid detection of porcine DNA in processed food samples using a streamlined DNA extraction method combined with the SYBR Green real-time PCR assay
By: Tan, Lee; Ahmed, Siti Aminah; Nga, Siew Kit; et al.
FOOD CHEMISTRY Volume: 309 Article Number: 125654 Published: MAR 20 2020

9.
DNA barcoding and mini-barcoding in authenticating processed animal-derived food: A case study involving the Chinese market
By: Xing, Ran-Ran; Hu, Ran-Ran; Han, Jian-Xun; et al.
FOOD CHEMISTRY Volume: 309 Article Number: 125653 Published: MAR 20 2020

10.
From aquaculture production to consumption: Freshness, safety, traceability and authentication, the four pillars of quality
By: Freitas, Jorge; Vaz-Pires, Paulo; Camara, Jose S.
AQUACULTURE Volume: 518 Article Number: UNSP 734857 Published: MAR 15 2020

11.
Impact of farming type, variety and geographical origin on bananas bacterial community
By: Bigot, Celine; Bugaud, Christophe; Camilo, Jose; et al.
FOOD CONTROL Volume: 109 Article Number: UNSP 106925 Published: MAR 2020

12.
The effect of storage temperature on the metabolic profiles derived from chicken eggs
By: Johnson, Amy E.; Sidwick, Kate L.; Pirgozliev, Vasil R.; et al.
FOOD CONTROL Volume: 109 Article Number: UNSP 106930 Published: MAR 2020

13.
On-Site Detection of Tissues of Buffalo Origin by Loop-Mediated Isothermal Amplification (LAMP) Assay Targeting Mitochondrial Gene Sequences
By: Kumari, Sarita; Kumar, R. R.; Mendiratta, S. K.; et al.
FOOD ANALYTICAL METHODS
Early Access: FEB 2020

14.
A robust RP-HPLC method for determination of turmeric adulteration
By: Sahu, Prafulla Kumar; Panda, Jagadeesh; Kumar, Y. V. V. Jogendra; et al.
JOURNAL OF LIQUID CHROMATOGRAPHY & RELATED TECHNOLOGIES
Early Access: FEB 2020

15.
Development of an FTIR based chemometric model for the qualitative and quantitative evaluation of cane sugar as an added sugar adulterant in apple fruit juices
By: Dhaulaniya, Amit S.; Balan, Biji; Yadav, Amit; et al.
FOOD ADDITIVES AND CONTAMINANTS PART A-CHEMISTRY ANALYSIS CONTROL EXPOSURE & RISK ASSESSMENT
Early Access: FEB 2020

16.
Present Conditions of Marijuana Regulation in USA: Medical and Recreational Use
By: Tomiyama, Ken-ichi; Funada, Masahiko
YAKUGAKU ZASSHI-JOURNAL OF THE PHARMACEUTICAL SOCIETY OF JAPAN Volume: 140 Issue: 2 Pages: 179-192 Published: FEB 2020

17.
Use of smartphone videos and pattern recognition for food authentication
By: Song, Weiran; Jiang, Nanfeng; Wang, Hui; et al.
SENSORS AND ACTUATORS B-CHEMICAL Volume: 304 Article Number: 127247 Published: FEB 1 2020

18.
Preliminary investigation into the use of Raman spectroscopy for the verification of Australian grass and grain fed beef
By: Logan, Bridgette G.; Hopkins, David L.; Schmidtke, Leigh; et al.
MEAT SCIENCE Volume: 160 Article Number: 107970 Published: FEB 2020

19.
An automated alarm system for food safety by using electronic invoices
By: Chang, Wan-Tzu; Yeh, Yen-Po; Wu, Hong-Yi; et al.
PLOS ONE Volume: 15 Issue: 1 Article Number: e0228035 Published: JAN 24 2020

20.
Application of the novel Droplet digital PCR technology for identification of meat species
By: Basanisi, Maria Grazia; La Bella, Gianfranco; Nobili, Gaia; et al.
INTERNATIONAL JOURNAL OF FOOD SCIENCE AND TECHNOLOGY
Early Access: JAN 2020

21.
Raman spectral analysis for non-invasive detection of external and internal parameters of fake eggs
By: Joshi, Ritu; Lohumi, Santosh; Joshi, Rahul; et al.
SENSORS AND ACTUATORS B-CHEMICAL Volume: 303 Article Number: 127243 Published: JAN 15 2020

22.
Electronic nose combined with chemometric approaches to assess authenticity and adulteration of sausages by soy protein
By: Kalinichenko, Asya; Arseniyeva, Larysa
SENSORS AND ACTUATORS B-CHEMICAL Volume: 303 Article Number: 127250 Published: JAN 15 2020

23.
Assessing the economy-wide impact of food fraud: A SAM-based counterfactual approach
By: Rocchi, Benedetto; Romano, Donato; Sadiddin, Ahmad; et al.
AGRIBUSINESS
Early Access: JAN 2020

24.
Qualitative Identification and Quantitative Analysis of Maca Adulteration Based on Multispectral Imaging Technology
By: Zhang Hong-rui; Liu Chang-hong; Zhang Jiu-kai; et al.
SPECTROSCOPY AND SPECTRAL ANALYSIS Volume: 40 Issue: 1 Pages: 152-156 Published: JAN 2020

25.
Classification of Milk Samples Using CART
By: Hansen, Lucas; Ferrao, Marco Flores
FOOD ANALYTICAL METHODS Volume: 13 Issue: 1 Special Issue: SI Pages: 13-20 Published: JAN 2020

26.
Chemometric Approach Using ComDim and PLS-DA for Discrimination and Classification of Commercial Yerba Mate (Ilex paraguariensis St. Hil.)
By: Vieira, Tatiane Francielli; Makimori, Gustavo Yasuo Figueiredo; Dos Santos Scholz, Maria Brigida; et al.
FOOD ANALYTICAL METHODS Volume: 13 Issue: 1 Special Issue: SI Pages: 97-107 Published: JAN 2020

27.
Comparison of Different Multivariate Classification Methods for the Detection of Adulterations in Grape Nectars by Using Low-Field Nuclear Magnetic Resonance
By: Miaw, Carolina Sheng Whei; Santos, Poliana Macedo; Silva, Alessandro Rangel Carolino Sales; et al.
FOOD ANALYTICAL METHODS Volume: 13 Issue: 1 Special Issue: SI Pages: 108-118 Published: JAN 2020

28.
Authentication of Two Bio-Active Fish Oils by Qualitative Lipid Profiling Using Semi-Targeted Approach: An Exploratory Study
By: Chatterjee, Niladri S.; Singh, Akanksha; Vishnu, K. V.; et al.
JOURNAL OF AOAC INTERNATIONAL Volume: 103 Issue: 1 Pages: 78-82 Published: JAN-FEB 2020

29.
Identification and Quantification of Nonviable Lactobacillus pentosus Cells in a Health Food Product
By: Liu, Na; Zhou, Wei; Wang, Chune; et al.
JOURNAL OF AOAC INTERNATIONAL Volume: 103 Issue: 1 Pages: 223-226 Published: JAN-FEB 2020

30.
Reliable, accessible and transferable method for the quantification of flavanols and procyanidins in foodstuffs and dietary supplements
By: Bussy, Ugo; May, Brian R.; Olanrewaju, Yusuf; et al.
FOOD & FUNCTION Volume: 11 Issue: 1 Pages: 131-138 Published: JAN 1 2020

31.
The cost-effectiveness of limiting federal housing vouchers to use in low-poverty neighborhoods in the United States
By: Zafari, Z.; Muennig, P.
PUBLIC HEALTH Volume: 178 Pages: 159-166 Published: JAN 2020

32.
Recent development in the application of analytical techniques for the traceability and authenticity of food of plant origin
By: Wadood, Syed Abdul; Guo Boli; Zhang Xiaowen; et al.
MICROCHEMICAL JOURNAL Volume: 152 Article Number: 104295 Published: JAN 2020

33.
Food refusal as a protest tool. Hunger strikes in Belgian prisons during the interwar period
By: Erkul, Ayfer
APPETITE Volume: 144 Article Number: UNSP 104448 Published: JAN 1 2020

34.
Are we sure we eat what we buy? Fish mislabelling in Buenos Aires province, the largest sea food market in Argentina
By: Delpiani, G.; Delpiani, S. M.; Deli Antoni, M. Y.; et al.
FISHERIES RESEARCH Volume: 221 Article Number: UNSP 105373 Published: JAN 2020

35.
Recent advances in untargeted and targeted approaches applied in herbal-extracts and essential-oils fingerprinting - A review
By: Kharbach, Mourad; Marmouzi, Ilias; El Jemli, Meryem; et al.
JOURNAL OF PHARMACEUTICAL AND BIOMEDICAL ANALYSIS Volume: 177 Article Number: UNSP 112849 Published: JAN 1 2020

36.
Composition of herring and cod fillets from the North and the Baltic Sea - Detecting added water
By: Bisenius, S.; Neuhaus, H.; Effkemann, S.; et al.
FOOD CONTROL Volume: 107 Article Number: UNSP 106766 Published: JAN 2020

37.
A PCR-based lateral flow assay for the detection of Turkey ingredient in food products
By: Zhao, Liangjuan; Wang, Kaidi; Yan, Chuncai; et al.
FOOD CONTROL Volume: 107 Article Number: UNSP 106774 Published: JAN 2020

38.
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