Agilent Technologies

Agilent Bond Elut QuEChERS extraction kit

A collection of citations to advance your research

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Environmental

Multi-residue analysis of free and conjugated hormones and endocrine disruptors in rat testis by QuEChERS-based extraction and LC-MS/MS

Analytical and Bioanalytical Chemistry, **402**, 2777-2788 (2012)
Charlène Pouech *et al.*

Tags
Bond Elut QuEChERS extraction kit, ZORBAX Eclipse Plus C18, SampliQ, environmental, emerging contaminants

Abstract
An Agilent Bond Elut QuEChERS kit and ZORBAX Eclipse Plus C18 column were used to extract and analyze hormones and endocrine disruptors. Published by Springer.

Multi-residue analysis of emerging pollutants in sediment using QuEChERS-based extraction followed by LC-MS/MS analysis

Analytical and Bioanalytical Chemistry, **406**, 1259–1266 (2014)
Alexandra Berlioz-Barbier *et al.*

Tags
Bond Elut QuEChERS, environmental, emerging contaminants, soils, sludges and sediments

Abstract
Agilent Bond Elut QuEChERS AOAC and EN salts were used to extract emerging pollutants from sediments. Published by Springer.

Food testing and agriculture

Multiresidue determination of 375 organic contaminants including pesticides, polychlorinated biphenyls and polyaromatic hydrocarbons in fruits and vegetables by gas chromatography–triple quadrupole mass spectrometry with introduction of semi-quantification approach

Journal of Chromatography A, **1270**, 283-295 (2012)
Kaushik Banerjee *et al.*

Tags
Bond Elut QuEChERS extraction kit, HP-5ms, 7890A GC, 7000B Triple Quadrupole GC/MS, food testing and agriculture, pesticides

Abstract
Agilent Bond Elut QuEChERS sample preparation combined with Agilent GC (7890A) and MS (7000B Triple Quadrupole), with Agilent J&W HP-5ms analytical columns and PTV were used for the analysis of 375 pesticide residues in a variety of produce samples. Published by Elsevier B. V.

Doxycycline and sulfadimethoxine transfer from cross-contaminated feed to chicken tissues

Food Additives & Contaminants, **28**, 860-868 (2011)
G. Segato *et al.*

Tags
SampliQ EN, Bond Elut QuEChERS extraction kit, food testing and agriculture, veterinary drugs

Abstract
During feed preparation at feed mills or during feed mixing in bins at farms, the accidental contamination of feed at trace levels by veterinary drug residues, commonly known as carry-over, can accidentally but frequently occur. To evaluate the concentrations of residual antimicrobials in poultry edible tissues, due to contaminated feed, sulfadimethoxine and doxycycline were administered for 10 days to chickens in poultry feed incurred at the contamination levels frequently found during national feed monitoring programmes (1–5 mg kg^{-1}). Sulfadimethoxine and doxycycline residual concentrations detected in muscle (<LOD and 31 µg kg^{-1}, respectively), liver (13 and 56 µg kg^{-1}, respectively) and kidney (56 and 115 µg kg^{-1}, respectively) were compared with their maximum residue limits (MRLs) fixed by EC 470/2009 and EU 37/2010 Regulations for a preliminary risk evaluation. ©2011 Taylor & Francis.

Multiresidue method to quantify pesticides in fish muscle by QuEChERS-based extraction and LC-MS/MS

Analytical and Bioanalytical Chemistry, **400**, 2185-2193 (2011)
Angélique Lazartigues *et al.*

Tags
Bond Elut QuEChERS extraction kit, SampliQ OPT, ZORBAX Eclipse Plus C18, 1290 Infinity LC, food testing and agriculture, pesticides

Abstract
Agilent SPE QuEChERS kits were used to clean up samples of fish muscle. Analysis was performed using an Agilent 1290 Infinity LC equipped with an Agilent ZORBAX Eclipse C18 column. Published by Springer.

Multiresidue LC–MS/MS analysis of cephalosporins and quinolones in milk following ultrasound-assisted matrix solid-phase dispersive extraction combined with the quick, easy, cheap, effective, rugged, and safe methodology

Journal of Separation Science, **36**, 2020-2027 (2013)
Eftichia Karageorgou *et al.*

Tags
Bond Elut QuEChERS extraction kit, Bond Elut Plexa, food testing and agriculture

Abstract
Agilent Bond Elut QuEChERS and Bond Elut Plexa delivered effective sample extraction in an examination of antibiotics in milk. Published by Elsevier B. V.

Detection of 6-benzylaminopurine plant growth regulator in bean sprouts using OFRR biosensor and QuEChERS method

Analytical Methods, **5**, 961-966 (2013)
Sangdae Lee, Gi-Young Kim, Ji-Hea Moon

Tags
Bond Elut QuEChERS, food testing and agriculture

Abstract
A plant growth regulator was extracted from bean plants using Agilent Bond Elut QuEChERS prior to LC/MS/MS analysis. Published by the Royal Society of Chemistry.

Direct Chiral Determination of Acephate and Its Metabolite Methamidophos in Vegetables Using QuEChERS by Gas Chromatography–Tandem Mass Spectrometry

Food Analysis Methods, **6**, 133-140 (2013)
Xiangyun Wang *et al.*

Tags
Bond Elut QuEChERS, SampliQ, ZORBAX Eclipse XDB, 1200, 6460, food testing and agriculture, pesticides

Abstract
In an investigation of acephate enantiomers and its metabolite methamidophos, Agilent Bond Elut QuEChERS was used for extraction, followed by LC/MS using an Agilent ZORBAX Eclipse XDB LC column fitted to an Agent 1200 Infinity with 6460 Triple Quadrupole MS. Published by Springer.

Ultrasound-assisted dispersive extraction for the high pressure liquid chromatographic determination of tetracyclines residues in milk with diode array detection

Food Chemistry, **150**, 328-334 (2014)
Eftichia Karageorgou *et al.*

Tags
Bond Elut QuEChERS, Bond Elut Plexa, food testing and agriculture, veterinary drugs

Abstract
Using a MSPD approach, Agilent Bod Elut Plexa and d-SPE with Bond Elut QuEChERS gave best recoveries in an investigation of tetracyclines residues in milk. Published by Elsevier B. V.

Determination of Some Chemical Contaminants Might Exist in Some Raw Food Materials Used in Some Egyptian Hotels

World Journal of Dairy & Food Sciences, **8**, 175-180 (2013)
M.A. Abd Al-Fattah, M. Emam, Z. Ashour

Tags
Bond Elut QuEChERS, DB-35ms UI, 7890/5975C GC/MS, 7683B Autosampler, food testing and agriculture, pesticides

Abstract
In an investigation of possible food contaminants in Egyptian catering establishments, Agilent Bond Elut QuEChERS was used for sample prep, followed by separation on an Agilent J&W DB-35ms Ultra Inert GC column fitted to an Agilent GC/MS system. Published by IDOSI Publications.

A modified QuEChERS method for simultaneous determination of flonicamid and its metabolites in paprika using tandem mass spectrometry

Food Chemistry, **157**, 412-420 (2014)
Ah-Young Ko *et al.*

Tags
Bond Elut QuEChERS, food testing and agriculture, persistent organic pollutants

Abstract
Agilent Bond Elut QuEChERS d-SPE was used for acetate-buffered sample preparation to improve extraction recovery of flonicamid and its two metabolites in paprika. Published by followed by analysis using tandem mass spectrometry. Published by Elsevier B. V.

Determination of Pesticide Residues in Honeybees using Modified QuEChERS Sample Work-Up and Liquid Chromatography-Tandem Mass Spectrometry

Molecules, **19**, 2911-2924 (2014)
Żaneta Bargańska, Marek Ślebioda, Jacek Namieśnik

Tags
Bond Elut QuEChERS, Poroshell 120, 1290 Infinity LC, 6460A LC/MS, food testing and agriculture, pesticides

Abstract
Increasing emissions of chemical compounds to the environment, especially of pesticides, is one of factors that may explain present honeybee colony losses. In this work, an analytical method employing liquid chromatography-tandem mass spectrometry (LC-MS/MS) was optimized for the simultaneous screening of 19 pesticides which have not been yet determined in honeybee samples from northern Poland (Pomerania). The sample preparation, based on the QuEChERS method combining salting-out liquid-liquid extraction to acetonitrile and a dispersive-SPE clean-up, was adjusted to honeybee samples by adding a small amount of hexane to eliminate beeswax. The recovery of analytes ranged from 70% to 120% with relative standard deviation ≤20%. The limits of detection were in the range of 0.91–25 ng/g. A total of 19 samples of honeybees from suspected pesticide poisoning incidents were analyzed, in which 19 different pesticides were determined. Published by MDPI.

The application of d-SPE in the QuEChERS method for the determination of PAHs in food of animal origin with GC–MS detection

European Food Research and Technology (2014)
Magdalena Surma, Anna Sadowska-Rociek, Ewa Cieślik

Tags
Bond Elut QuEChERS, food testing and agriculture, persistent organic pollutants

Abstract
The authors determined polycyclic aromatic hydrocarbons (PAHs) in food of animal origin using Agilent Bond Elut QuEChERS d-SPE. They employed several variations of solvents and d-SPE. EtOAC and PSA/C18 d-SPE were the best for extracting PAHs. Published by Springer.

Analytical performance of two miniaturised extraction methods for triclosan and methyltriclosan, in fish roe and surimi samples

Food Chemistry, **146**, 141-148 (2014)
R. Gonzalo-Lumbreras, J. Sanz-Landaluze, C. Cámara Cieślik

Tags
Bond Elut QuEChERS, 7890A/5975C GC/MS, 7683B Autosampler, food testing and agriculture, pesticides

Abstract
The authors report a new and reliable miniaturized QuEChERS-based extraction method, combined with a dispersive SPE cleanup procedure with Agilent Bond Elut QuEChERS, to extract triclosan and methyltriclosan from fish roe and surimi samples. Published by Elsevier B. V.

Determination of parent and substituted polycyclic aromatic hydrocarbons in high-fat salmon using a modified QuEChERS extraction, dispersive SPE and GC–MS

Journal of Agricultural and Food Chemistry, **59**, 8108-8116 (2011)
Norman D. Forsberg, Glenn R. Wilson, Kim A. Anderson

Tags
Bond Elut QuEChERS, SampliQ, DB-5ms, 5975B MSD, food testing and agriculture, persistent organic pollutants

Abstract
A fast and easy modified QuEChERS (quick, easy, cheap, rugged and safe) extraction method has been developed and validated for determination of 33 parent and substituted polycyclic aromatic hydrocarbons (PAHs) in high-fat smoked salmon that greatly enhances analyte recovery compared to traditional QuEChERS procedures. Sample processing includes extraction of PAHs into a solution of ethyl acetate, acetone and isooctane followed by cleanup with dispersive SPE and analysis by GC–MS in SIM mode. Method performance was assessed in spike recovery experiments (500 µg/g wet weight) in three commercially available smoked salmon with 3–11% fat. Recoveries of some 2-, 3- and 5-ring PAHs were improved 50–200% over traditional methods, while average recovery across all PAHs was improved 67%. Method precision was good with replicate extractions typically yielding relative standard deviations <10%, and detection limits were in the low ng/g range. With this method, a single analyst could extract and clean up ≥60 samples for PAH analysis in an 8 h work day. Reprinted with permission from the Journal of Agricultural and Food Chemistry.

Multiresidue Pesticide Analysis of Dried Botanical Dietary Supplements Using an Automated Dispersive SPE Cleanup for QuEChERS and High-Performance Liquid Chromatography-Tandem Mass Spectrometry

Journal of Agricultural and Food Chemistry, **60**, 9991-9999 (2012)
Yang Chen *et al.*

Tags
Bond Elut QuEChERS, ZORBAX Eclipse Plus C18, 1200 Series, 6460 LC/MS, food testing and agriculture, dietary supplements, pesticides

Abstract
An automated dispersive solid phase extraction (dSPE) cleanup procedure as part of the Quick, Easy, Cheap, Effective, Rugged, and Safe (QuEChERS) method, coupled with liquid chromatography–tandem mass spectrometry using electrospray ionization in positive mode, was used for the simultaneous analysis of 236 pesticides in three dried powdered botanical dietary supplements (ginseng, saw palmetto, and gingko biloba). The procedure involved extraction of the dried powdered botanical samples with salt-out acetonitrile/water extraction using anhydrous magnesium sulfate and sodium chloride, followed by an automated dSPE cleanup using a mixture of octadodecyl- (C18) and primary–secondary amine (PSA)-linked silica sorbents and anhydrous MgSO4 and online LC-MS/MS analysis. Dynamic multiple-reaction monitoring (DMRM) based on the collection of two precursor-to-product ion transitions with their retention time windows was used for all of the targeted pesticides and the internal standard. Matrix-matched calibration standards were used for quantitation, and standard calibration curves showed linearity ($r2 > 0.99$) across a concentration range of 0.2–400 ng/mL for the majority of the 236 pesticides evaluated in the three botanical matrices. Mean recoveries (average %RSD, $n = 4$) were 91 (6), 93 (4), 96 (3), and 99 (3)% for ginseng, 101 (9), 98 (6), 99 (4), and 102 (3)% for gingko biloba, and 100 (9), 98 (6), 96 (4), and 96 (3)% for saw palmetto at fortification concentrations of 25, 100, 250, and 500 µg/kg, respectively. The geometric mean matrix-dependent instrument detection limits were 0.17, 0.09, and 0.14 µg/kg on the basis of the studies of 236 pesticides tested in ginseng roots, gingko biloba leaves, and saw palmetto berries, respectively. The method was used to analyze incurred ginseng samples that contained thermally labile pesticides with a concentration range of 2–200 µg/kg, indicating different classes of pesticides are being applied to these botanicals other than the traditional pesticides that are commonly used and analyzed by gas chromatography techniques. The method demonstrates the use of an automated cleanup procedure and the LC-MS/MS detection of multiple pesticide residues in dried, powdered botanical dietary supplements.

Alternative sample treatments for the determination of sulfonamides in milk by HPLC with fluorescence detection

Food Chemistry, **143**, 459-464 (2014)
Natalia Arroyo-Manzanares, Laura Gámiz-Gracia, Ana M. García-Campaña

Tags
Bond Elut QuEChERS, SampliQ, food testing and agriculture, veterinary drugs

Abstract
Agilent Bond Elut QuEChERS salts and d-SPE were compared to dispersive liquid–liquid microextraction. Both gave good recovery and RSD. However, Bond Elut QuEChERS was easier to use and yielded an extract amenable to LC with fluorescence detection. Published by Elsevier B. V.

A novel method for determination of patulin in apple juices by GC–MS

Food Chemistry, **141**, 1619-1623 (2013)
Niloofar Kharandi. Mehran Babri, Jila Azad

Tags
Bond Elut QuEChERS, HP-5ms, 6890/5973N GC/MS, food testing and agriculture, mycotoxins and biotoxins

Abstract
Agilent Bond Elut PSA in bulk was used to extract patulin from apples. Analysis was then accomplished with an Agilent J&W HP-5ms GC column fitted to an Agilent 6890 GC with detection provided by an Agilent 5973N mass selective detector. Published by Elsevier B. V.

Multiclass mycotoxin analysis in *Silybum marianum* by ultra high performance liquid chromatography–tandem mass spectrometry using a procedure based on QuEChERS and dispersive liquid-liquid microextraction

Journal of Chromatography A, **1282**, 11-19 (2013)
Natalia Arroyo-Manzanares, Ana M. García-Campaña, Laura Gámiz-Gracia,

Tags
Bond Elut QuEChERS, ZORBAX Eclipse Plus, food testing and agriculture, mycotoxins and biotoxins, dietary supplements, natural compounds and additives

Abstract
A method was developed using Agilent Bond Elut QuEChERS salts and d-SPE EN to extract mycotoxins from milk thistle. An Agilent ZORBAX Eclipse Plus LC provided the analysis. Published by Elsevier B. V.

Determination of thyreostats in muscle and thyroid tissues by QuEChERS extraction and ultra-performance liquid chromatography tandem mass spectrometry

Food Additives & Contaminants: Part A, **30**, 949-957 (2012)
Francesca Lega *et al.*

Tags
Bond Elut QuEChERS, food testing and agriculture, veterinary drugs

Abstract
The use of thyreostats as veterinary drugs is banned in the European Union since 1981 because of their carcinogenic and teratogenic properties. Controlling their illegal use in breeding animals is quite difficult because of their low molecular weight, high polarity and the presence of tautomeric forms. To harmonise the performance of analytical methods, the recommended concentration for thyreostats such as thiouracil, methylthiouracil, propylthiouracil and tapazole established by the Community Reference Laboratory in 2007 is 10 ng g^{-1}. The majority of the currently available analytical methods require a time-consuming derivatisation step and/or an SPE clean-up step. In this study, a rapid confirmatory method for the determination of six thyreostatic drugs – thiouracil, methylthiouracil, propylthiouracil, phenylthiouracil, tapazole and 2-mercaptobenzoimidazole – in thyroid and muscle at recommended concentration is presented. Quick sample extraction has been achieved by QuEChERS with ethyl acetate without further clean-up or derivatisation steps. Analysis has been carried out by using UPLC-ESI-MS/MS. Performance characteristics of the method have been determined in agreement with Commission Decision 2002/657/EC requirements for confirmatory methods and calculated decision limits (CCα) are below the recommended concentration (10 ng g^{-1}). ©2012 Taylor & Francis.

Determination of Some Chemical Contaminants Might Exist in Some Raw Food Materials Used in Some Egyptian Hotels

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