List of analytical methods for processing contaminants in food

The list contains information about available official analytical methods in the field of analysis of processing contaminants in food. The list was compiled to the best of our knowledge and does not claim to be exhaustive.

Acrylamide

Method or guidance document	Title
ISO 18862:2016	Coffee and coffee products -- Determination of acrylamide -- Methods using HPLC-MS/MS and GC-MS after derivatization
CEN/TS 17083:2017	Foodstuffs -- Determination of acrylamide in food and coffee by gas chromatography-mass spectrometry (GC-MS)
EN 16618:2015	Food analysis -- Determination of acrylamide in food by liquid chromatography tandem mass spectrometry (LC-ESI-MS/MS)

Furan

Method or guidance document	Title
EN 16620:2015	Food analysis -- Determination of furan in coffee and coffee products by headspace gas chromatography and mass spectrometry (HS GC-MS)

2- and 3-MCPD and GE

Method or guidance document	Title
AOCS Official Method Cd 29a-13	2- and 3-MCPD Fatty Acid Esters and Glycidol Fatty Acid Esters in Edible Oils and Fats by Acid Transesterification and GC/MS
AOCS Official Method Cd 29b-13	2- and 3-MCPD Fatty Acid Esters and Glycidol Fatty Acid Esters in Edible Oils and Fats by Alkaline Transesterification and GC/MS
AOCS Official Method Cd 29c-13	2- and 3-MCPD Fatty Acid Esters and Glycidol Fatty Acid Esters in Edible Oils and Fats by GC/MS (Difference Method)
EN 14573:2005	Foodstuffs - Determination of 3-monochloropropane-1,2-diol by GC/MS

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Method or guidance document	Title
ISO 18363-1:2015	Animal and vegetable fats and oils -- Determination of fatty-acid-bound chloropropanediols (MCPDs) and glycidol by GC/MS -- Part 1: Method using fast alkaline transesterification and measurement for 3-MCPD and differential measurement for glycidol
ISO 18363-2:2025	Animal and vegetable fats and oils -- Determination of fatty-acid-bound chloropropanediols (MCPDs) and glycidol by GC/MS -- Part 2: Method using slow alkaline transesterification and measurement for 2-MCPD, 3-MCPD and glycidol
ISO 18363-3:2024	Animal and vegetable fats and oils -- Determination of fatty-acid-bound chloropropanediols (MCPDs) and glycidol by GC/MS -- Part 3: Method using acid transesterification and measurement for 2-MCPD, 3-MCPD and glycidol
ISO 18363-4:2021	Animal and vegetable fats and oils -- Determination of fatty-acid-bound chloropropanediols (MCPDs) and glycidol by GC/MS -- Part 4: Method using fast alkaline transesterification and measurement for 2-MCPD, 3-MCPD and glycidol by GC-MS/MS
Report EUR 27288 EN	Development and validation of analytical methods for the analysis of 3-MCPD (both in free and ester form) and glycidyl esters in various food matrices and performance of an ad-hoc survey on specific food groups in support to a scientific opinion on comprehensive risk assessment on the presence of 3-MCPD and glycidyl esters in food
Dubois et al.: Journal of AOAC International Vol. 102, No. 3, 2019, 903	Determination of 2- and 3-MCPD as well as 2- and 3-MCPD Esters and Glycidyl Esters (GE) in Infant and Adult/Pediatric Nutritional Formula by Gas Chromatography Coupled to Mass Spectrometry Method, First Action 2018.03
J. Kuhlmann, Journal of AOAC International Vol. 102, No. 4, 2019, 1205	2-Monochloropropanediol (2-MCPD), 3-Monochloropropanediol (3-MCPD), and Glycidol in Infant and Adult/Pediatric Nutritional Formula: Single-Laboratory Validation, First Action 2018.12

PAHs

Method or guidance document	Title
DIN CEN/TS 16621:2014	Food analysis -- Determination of benzo[a]pyrene, benz[a]anthracene, chrysene and benzo[b]fluoranthene in foodstuffs by high performance liquid chromatography with fluorescence detection (HPLC-FD)
DIN EN ISO 15753:2016	Animal and vegetable fats and oils -- Determination of polycyclic aromatic hydrocarbons
DIN EN ISO 15302:2017	Animal and vegetable fats and oils -- Determination of benzo[a]pyrene -- Reverse-phase high performance liquid chromatography method
DIN EN ISO 22959:2009	Animal and vegetable fats and oils -- Determination of polycyclic aromatic hydrocarbons by on-line donor-acceptor complex chromatography and HPLC with fluorescence detection

Method or guidance document	Title
EN 16619:2015	Food analysis - Determination of benzo[a]pyrene, benz[a]anthracene, chrysene and benzo[b]fluoranthene in foodstuffs by gas chromatography mass spectrometry (GC-MS)

Ethyl carbamate

Method or guidance document	Title
EN 16852:2017	Foodstuffs - Determination of ethyl carbamate in stone fruit spirits, fruit marc spirits and other spirit drinks - GC-MS method

MOSH/MOAH

Method or guidance document	Title
ISO 20122:2024	Vegetable oils - Determination of mineral oil saturated hydrocarbons (MOSH) and mineral oil aromatic hydrocarbons (MOAH) with online-coupled high performance liquid chromatography-gas chromatography-flame ionization detection (HPLC-GC-FID) analysis - Method for low limit of quantification
European Commission, Joint Research Centre (JRC) SOP (2022)	Standard Operating Procedure (SOP): Method for official control of mineral oil content in infant formulas https://joint-research-centre.ec.europa.eu/system/files/2022-10/MO%20content%20IF_SOP_EURL%20FCM_0.pdf
European Commission, Joint Research Centre (JRC) Technical Report (2023)	Guidance on sampling, analysis and data reporting for the monitoring of mineral oil hydrocarbons in food and food contact materials https://op.europa.eu/en/publication-detail/-/publication/97cb92c2-d29e-11ed-a05c-01aa75ed71a1/language-en
Deutsche Gesellschaft für Fettwissenschaft (DGF) Einheitsmethode C-VI 22 (20)	Mineral oil saturated hydrocarbons (MOSH) and aromatic hydrocarbons (MOAH) with online coupled LC-GC-FID, method for low limit of quantification
DIN EN 17517:2021	Animal feeding stuffs: Methods of sampling and analysis - Determination of mineral oil saturated hydrocarbons (MOSH) and mineral oil aromatic hydrocarbons (MOAH) with on-line HPLC-GC-FID analysis
EURL-PC, Guidance Document (2025)	Analysis of MOSH and MOAH in food by GC×GC : Guidance on analysis, interpretation and data reporting https://doi.org/10.11581/fbe4e1ce-65c2-468f-9cea-cb3a140beade

General documents

Method or guidance document	Title
European Commission, Joint Research Centre (JRC) Technical Report (2016)	Guidance Document on the Estimation of LOD and LOQ for Measurements in the Field of Contaminants in Feed and Food https://dx.doi.org/10.2787/8931
EURL-MN, EURL-PC, EURL-POPs, EURL mycotoxins & plant toxins, Guidance document (2022)	Guidance Document on the Estimation of LOQ for Measurements in the Field of Contaminants in Feed and Food https://www.eurl-pc.eu/-/media/sites/eurl-pc/guidance_document_on_the_estimation_of_loq_for_measurements_in_the_field_of_contaminants_in_feed_and.pdf

List of certified reference materials for processing contaminants in food

The list was compiled to the best of our knowledge and does not claim to be exhaustive. It contains examples of matrix certified reference materials (CRMs) that are relevant for work related analysis of process contaminants. In addition to matrix CRMs, there are also less well-characterized materials such as reference and QC materials or materials that were used for proficiency tests. Such materials are not listed below. It is up to the laboratories to select suitable materials according to their requirements.

Acrylamide

Supplier	Number	Matrix	Description
KRISS	CRM 108-02-006	Infant formula	S. Lee, S.-Y. Baek, J. Han, J. Lee, Development of a certified reference material for the accurate analysis of the acrylamide content in infant formula, Anal. Bioanal. Chem., **2023**, *415*, 4805 https://doi.org/10.1007/s00216-023-04779-4
KRISS	CRM 108-10-003	Potato chip	B. Kim, S. Park, I. Lee, Y. Lim, E. Hwang, H.-Y. So, Development of a certified reference material for the determination of acrylamide in potato chips, Anal. Bioanal. Chem., **2010**, 398, 1035 https://doi.org/10.1007/s00216-010-3953-8
BAM	ERM-BD513	Cocoa	w = 0.051 mg/kg ± 0.018 mg/kg
BAM	ERM-BD514	Cocoa	w = 0.101 mg/kg ± 0.026 mg/kg
BAM	ERM-BD515	Cocoa	w = 0.095 mg/kg ± 0.025 mg/kg

KRISS: Korean Research Institute of Standards and Science (https://www.kriss.re.kr/measurement/measurementCRMForm.es?mid=a20402000000)
BAM: Bundesanstalt für Materialforschung und -prüfung, Germany (https://webshop.bam.de/webshop_en)

Furan

Supplier	Number	Matrix	Description
Restek	33334	Methanol	Furan/Alkylfurans Standard, 100 µg/mL, P&T Methanol, 1 mL/ampul

2- and 3-MCPD and GE

Supplier	Number	Matrix	Description
EC-JRC	ERM-BD087	Infant formula	2- and 3-MCPD esters in infant formula

EC-JRC: European Commission - Joint Research Centre (https://crm.jrc.ec.europa.eu/p/ERM-BD087?trk=article-ssr-frontend-pulse_little-text-block)

PAHs

Supplier	Number	Matrix	Description
NIST*	SRM 2974a	Mussel Tissue (Mytilus edulis)	Organics in Freeze-Dried Mussel Tissue (Mytilus edulis)
NIST*	SRM 3253	Yerba Mate Leaves	Yerba Mate Leaves
EC-JRC*/**	BCR-459	Coconut oil	Coconut oil (PAH blank)
METAS*	WP-CBR001	Whey protein powder with approx. 80 % protein content	BaA, BaP, BbF and Chr S. Lobsiger, L. Märki, S. Mallia, G. Umbricht, H. Sprecher, K. Breitruck, M. Obkircher, Development of a novel certified reference material for the determination of polycyclic aromatic hydrocarbons (PAHs) in whey protein powder, Anal. Bioanal. Chem., **2023**, *415*, 5819 https://doi.org/10.1007/s00216-023-04863-9
IAEA	IAEA-451	Clam	Freeze dried biota (clam, Gafrarium trumidum)
IAEA	IAEA-435A	Tuna	Tuna homogenate
BAM	BAM-A001	Olive oil	BaA, Chr, BbF and BaP
HSA	HRM-1024A	Olive oil	BaA and BaP
TUBITAK UME	UME RM 9921	Infant formula	BaA, BaP, BbF and Chr
KRISS	CRM 108-10-025	Soybean oil	BaA, BaP, BbF and Chr

NIST: National Institute of Standards and Technology (https://www.nist.gov/srm)
EC-JRC: European Commission - Joint Research Centre
IAEA: International Atomic Energy Agency (https://nucleus.iaea.org/sites/ReferenceMaterials/SitePages/Home.aspx)
HAS: Health Sciences Authority, Singapore, (https://www.hsa.gov.sg/about-us/applied-sciences/chemical-metrology/metrological-services)
TUBITAK UME: National Metrology Institute (https://rm.ume.tubitak.gov.tr/urun_listesi_en.aspx)
KRISS: Korean Research Institute of Standards and Science (https://www.kriss.re.kr/measurement/measurementCRMForm.es?mid=a20402000000)
* Also available from Merck KGaA, Darmstadt, Germany (https://www.sigmaaldrich.com/)
** Also available from LCG (https://www.lgcstandards.com/)

Ethyl carbamate

To the best of our knowledge, there is no matrix CRM for ethyl carbamate available on the market.

MOSH/MOAH

Supplier	Number	Matrix	Description
Restek	31070	Toluene	MOSH/MOAH Standard, 150-600 µg/mL, Toluene, 1 mL/ampul