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Nestlé Quality Assurance Center
Dublin

Technical Datasheet

Analysis Name: 2- and 3-MCPD Fatty Acid Esters and Glycidol Fatty Acid Esters in Edible Oils and Fats by Acid Transesterification

Method Number: AOCS-Cd 29a-13

Scope of Application: Fat and oils and infant formula* although any applicable matrix will be attempted. If acceptance criteria established by the matrices that are validated is not met then the matrix will be considered not compatible or increased QLs may be reported. Products other than fat/oil will be reported as in product unless results in fat/oil are specifically requested.

*Product types other than fat/oil will require the appropriate fat determination test (LI-00.520 Fat by Mojonnier or LI-75.204 Fat by Acid Hydrolysis) be added (unless already requested) in order to provide in-product results.

Description: A 0.1 g test portion is supplemented with isotopically labelled internal standards. Glycidyl esters are converted to 3-monobromopropanediol (3-MBPD) monoesters in an acid solution containing a bromide salt. 3-MBPD esters, together with 2- and 3-MCPD esters, are then converted into the free (non-esterified) form in acid methanolic solution. The fatty acid methyl esters generated during the reaction are extracted from the sample; and 2- and 3-MCPD as well as 3-MBPD, are then derivatized with phenylboronic acid prior to GC-MS/MS analysis and quantitation. Results for 3-MCPD esters, 2-MCPD esters and glycidyl esters are expressed respectively as free 3-MCPD, 2-MCPD and glycidol equivalent. Quantification is performed by the isotopic dilution approach using labelled internal standards.

Fat/oil extraction from infant formula is performed using a Mojonnier method. Fat is extracted via dissolution and treatment of the milk product with an ethanol solution and ammonia followed by the extraction of the fat with diethyl ether and petroleum ether and finally removal of the solvents by evaporation.



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Sample Weight Required: 100 g

Method Reference: AOCS Cd 29a-13 American Oil Chemists' Society, 2013. "2- and 3-MCPD Fatty Acid Esters and Glycidol Fatty Acid Esters in Edible Oils and Fats by Acid Transesterification"

Analytical Platform: GC-MS/MS

Special Information: Products must contain > 2% fat or testing cannot be completed.

Compound	Quantitation Limit	Variation
2-chloropropane-1,3-diol fatty acid esters (Bound 2-MCPD)	0.05 mg/kg in fat	QL listed is adjusted based on fat content in product if applicable
3-chloropropane-1,2-diol fatty acid esters (Bound 3-MCPD)		
Glycidyl fatty acid esters (Bound Glycidol)		