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Expert Committee on Food Additives (JECFA), 99th Meeting 2024

Polyglycerol esters of fatty acids

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Polyglycerol esters of fatty acids

Revised specifications prepared at the 99th JECFA (2024) and published in FAO JECFA Monographs 34 (2025), superseding specifications prepared at the 35th JECFA (1989) and published in FNP 49 (1990). The Committee reaffirmed the ADI of 0.25 mg/kg bw established at the 35th JECFA (1989).

SYNONYMS

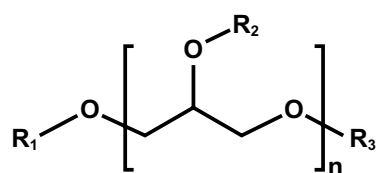
Polyglycerol fatty acid esters, glycerin fatty acid esters;
INS No. 475

DEFINITION

Polyglycerol esters of fatty acids are mixed esters formed by partially esterifying polymerized glycerols (polyglycerols) with fats, oils, or fatty acids. To mitigate the occurrence of contaminants coming from raw materials, only edible food grade precursors and those that have been prepared in a manner consistent with the Codex Alimentarius “Code of Practice for the Reduction of 3-Monochloropropane-1,2-Diol Esters (3-MCPDEs) and Glycidyl Esters (GEs) in Refined Oils and Food Products Made with Refined Oils” (CXC 79-2019) may be used. Polyglycerol esters of fatty acids may contain minor amounts of mono-, di-, and triglycerides, free glycerol and polyglycerols, free fatty acids, and sodium salts of fatty acids. The degree of polymerization of the polyglycerol portion of Polyglycerol esters of fatty acids varies, and is specified by a number (such as tri-) that is related to the average number of glycerol residues per polyglycerol molecule. A specified polyglycerol consists of a distribution of molecular species characteristic of its nominal degree of polymerization. By varying the proportions as well as the nature of the fats or fatty acids to be reacted with the polyglycerols, a large and diverse class of products may be obtained.

The article of commerce may be further specified as to saponification value, solidification point of the free fatty acids, iodine value, hydroxyl value and ash content.

Structural formula



where the average value of n is about 3 and R_1 , R_2 and R_3 each may be a fatty acid moiety or hydrogen

DESCRIPTION

Light yellow to amber, oily to very viscous liquids; light tan to medium brown, plastic or soft solids; and light tan to brown, hard, waxy solids

FUNCTIONAL USES

Emulsifier

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4)	From very hydrophilic to very lipophilic, but as a class tend to be dispersible in water and soluble in organic solvents
Free fatty acids (Vol. 4)	Not more than 6% estimated as oleic acid (use equivalence factor (e) of 28.2)

PURITY

Polyglycerol determination in polyglycerol esters (Vol. 4) The polyglycerol moiety shall be composed of not less than 70% of di-, tri- and tetra- glycerols and shall contain not more than 10% of polyglycerols equal to or higher than heptaglycerol.

Arsenic (Vol. 4) Not more than 0.2 mg/kg
Determine using a method appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the methods described in Vol. 4 (under “General methods, metallic impurities”).

Cadmium (Vol. 4) Not more than 0.2 mg/kg
Determine using a method appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the methods described in Vol. 4 (under “General methods, metallic impurities”).

Lead (Vol. 4) Not more than 0.5 mg/kg
Determine using a method appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the methods described in Vol. 4 (under “General methods, metallic impurities”).

Mercury (Vol. 4) Not more than 0.5 mg/kg
Determine using a method appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the methods described in Vol. 4 (under “General methods, metallic impurities”).