

Nutritional Values of Lecithins

Nutrition labelling of food products is not required in business-to-business relations. However, information about the nutrition values of ingredients is usually requested by the final food producers for calculation of nutritional values of final products. Nutritional labelling of final food products required by Regulation (EU) No 1169/2011¹ concerns the following parameters: Energy value, fat, saturates, carbohydrate, sugars, protein and salt. The mandatory nutrition declaration can be supplemented with an indication of the amounts of mono-unsaturates, polyunsaturates, polyols, starch and fibre. Nutritional values stated in ELMA members' product data sheets usually include additional information on the content of water and ash.

Lecithins consist of a naturally occurring mixture of phospholipids, glycolipids, neutral lipids and carbohydrates. Due to this unique composition, determining the nutrition values of lecithin in accordance with Regulation (EU) 1169/2011 requires further considerations:

Fat

According to Regulation (EU) No 1169/2011 'fat' means total lipids and includes phospholipids. It is the sum of fatty acids, phospholipid head groups, glycolipids, and triglycerides. The total fat content represents on average 92 % of de-oiled lecithin and 94% of fluid lecithin.²

Trans fats

'Trans-fats' are fatty acids with at least one non-conjugated (namely interrupted by at least one methylene group) carbon-carbon double bond in the trans configuration, as defined within Regulation (EU) No 1169/2011. However, according to the same Regulation, trans-fats may not be provided in the nutrition labelling information for food products.

The maximum level of trans-fat in food of plant origin is regulated in Europe by Regulation (EU) 2019/649, which will prohibit the placing on the market of non-compliant food as from 1 April 2021. According to this Regulation, the content of trans-fat, other than trans-fat naturally occurring in fat of animal origin, in food intended for the final consumer and food intended for supply to retail, shall not exceed 2 grams per 100 grams of fat. Typically, lecithins contain between 0,1 - <2% trans-fat.

Carbohydrate

Carbohydrate means any carbohydrate which is metabolised by humans. The content of carbohydrate may be supplemented with an indication of the amounts of the following subcategories: sugars, starches and polyols (alcohol sugars). Lecithins contain sucrose, raffinose and stachyose, which can be analysed by high performance liquid chromatography (HPLC). Analyses of lecithins of different geographical origin provide an average carbohydrate content of 4,5% with a range of +/- 1,5% for fluid lecithins. For de-oiled lecithins the content of carbohydrates is slightly higher, 7% with a range of +/- 2%. This represents the amount of carbohydrates including sugars.

¹ [Regulation \(EU\) No 1169/2011](#) on the provision of food information to consumers

² The total fat is the sum of phospholipids, glycolipids, triglycerides and free fatty acids which is in summary ca. 92% respectively 94%. The composition of fat fractions can vary based on lecithin types. It is important to note that there are several methods for fat analysis that can be used and which result in differing analysis results:

By using the a hydrolysis method, only the fatty acids in phospholipids are detected. Consequently, the result of the analysis indicates much lower fat content (~ 40-70%) as phospholipids contain only two fatty acids per molecule. Whereas when using an extraction method, all the fat is extracted and much higher fat content is indicated (ca. 92 to 94%). The higher fat values detected by the organic solvent extraction is due to the detection of all materials soluble in the extracting agent i.e. phospholipids, glycolipids, triglycerides (containing three fatty acids per molecule) and any other fractions soluble in the extracting agent.

Sugars

The sugar content represents the natural content of mono- and di-saccharides, primarily represented in lecithin by sucrose.

Protein

According to EU Regulation (EU) No 1169/2011 the protein content is calculated based on the total nitrogen analysed in the food. As lecithins contain nitrogen in its phospholipid group, the analysis determines a value which does not reflect the content of protein bound nitrogen.

There is in principle no protein expected in lecithins. The residue levels of protein in lecithins can be specified as < 0,3 % defined by the purity criteria parameter for lecithins E 322 Toluene Insoluble (or Hexane Insoluble) set in Regulation (EU) No 231/2012.³

Fibre

Lecithins do not contain any substances falling under the definition of fibre laid down in Regulation (EU) No 1169/2011 on the provision of food information to consumers.

Salt

The labelling declaration uses the term 'salt' instead of the corresponding term of the nutrient 'sodium' for easier understanding of the information by the final consumer. The amount of salt is the equivalent content of sodium calculated using the formula: salt = sodium × 2,5. The sodium content is on average 30 – 50 mg/100g.

Nutritional values mentioned above are average values and are monitored periodically and may therefore vary based on crop quality and area of cultivation. Average monitoring values used for the above parameters have their own analytical uncertainties per specific parameter, therefore the sum of individual parameters might not be exactly 100g.

The nutritional information gives typical nutritional values for fluid- and de-oiled lecithin per 100g as stated in the table below:

	Fluid Lecithin	De-oiled lecithin
Energy	3626 kJ/ 866 kcal	3584 kJ/ 856 kcal
Fat	94 g	92 g
- of which saturated	See table for different origin	See table for different origin
- of which monounsaturated		
- of which polyunsaturated		
Carbohydrate	5g	7g
- of which sugars	2g	3g
Protein	0 g	0 g
Salt	0 g	0 g

Values mentioned above are for nutritional purpose and might differ from the specification or Certificate of Analysis issued per delivered batch.

The energy values are calculated according to Regulation (EC) No 1169/2011: Carbohydrate: x 17 kJ/g (4 kcal/g), Protein: x 17 kJ/g (4 kcal/g) and Fat: x 37 kJ/g (9 kcal/g).

³ [Regulation \(EU\) No 231/2012](#) laying down specifications for food additives listed in Annexes II and III to Regulation (EC) No 1333/2008

Typical fatty acid composition of lecithins by botanical origin per 100g ⁴		
	Fluid Soya Lecithin	De-oiled Soya Lecithin
Fat	94 g	92 g
- of which saturated	14.5 g	14.2 g
- of which monounsaturated	22.4 g	21.9 g
- of which polyunsaturated	57.1 g	55.9 g
	Fluid Sunflower Lecithin	De-oiled Sunflower Lecithin
Fat	94 g	92 g
- of which saturated	11.7 g	11.4 g
- of which monounsaturated	25.3 g	24.7 g
- of which polyunsaturated	57.0 g	55.8 g
	Fluid Rapeseed Lecithin	De-oiled Rapeseed Lecithin
Fat	94 g	92 g
- of which saturated	7.2 g	7.1 g
- of which monounsaturated	57.9 g	56.7 g
- of which polyunsaturated	28.9 g	28.3 g

Additional information

Ash

Ash is not a required element for food nutrition declaration in Europe. However, this information is often requested by customers. Ash refers to any inorganic material, such as minerals. With the standard method for ash determination the phosphorous coming from the phospholipids would be measured and would result in a very high ash content, which does not display the real mineral content. Therefore, ash content is reported as not applicable.

Water

Water – Moisture is not a required element for nutrition declaration in Europe. However, this information is often requested by customers. Water is based on purity criteria for Lecithins E322 according to Regulation (EU) No 231/2012. The moisture is limited to maximum of 2% and expressed in nutritional information as typ. 1%.

⁴ Calculated on the basis of fatty acid composition of relevant vegetable oils listed in Codex Standard for named vegetable oils (CXS 210-1999)