



## Fatty acid composition of oils

### Background

An analysis of the fatty acid composition is an important aspect in determining the quality and physiological value of fats and oils. Some fatty acids are essential dietary components. They vary with respect to chain length and degree of saturation and may be saturated, monounsaturated or polyunsaturated, whereby omega-3 fatty acids play a particularly important role. There are numerous products with standardised omega-3 fatty acid content, which are marketed as medicinal products or food supplements. Efficient validated methods are not only required to analyse the raw materials used, but also for the release and stability testing of finished products with complex compositions.

### Omega-3 fatty acids

Omega-3 fatty acids include alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which are found in high concentrations in fish oils. Amongst others they exert a positive effect on cholesterol levels and blood pressure, and there is scientific evidence to indicate that omega-3 fatty acids can reduce the risk of cardiovascular disease and inflammatory processes. They also play an important role in the development of the nervous system. Furthermore, alpha-linolenic acid is one of the essential fatty acids that the body is unable to synthesise and it must therefore be ingested with food.

### Statutory regulations

Not all fatty acids are desirable in a product. One example of these is erucic acid which causes fatty degeneration of the heart muscle when consumed in high concentrations. Its maximum levels in vegetable oils are governed by Commission Regulation (EU) 2023/915 and may not exceed 20.0 g/kg, or 50.0 g/kg in camelina, mustard seed and borage seed oil.

### Pharmacopoeia

A method for determination of the fatty acid composition in medicinal products is described in section 2.4.22 "Composition of fatty acids by gas chromatography" of the European Pharmacopoeia. The methyl esters obtained by esterification are separated by means of gas chromatography and detected by flame ionisation. The pharmacopoeia describes three

different methods. At PhytoLab we have established the two most relevant methods, A and C. They are suitable, e.g., for avocado oil, peanut oil, sunflower oil or hemp seed oil. Beyond that we have an efficient in-house method for determination of omega-3 fatty acids at our disposal.

### Our service for you

PhytoLab's expertise also includes the analysis of fatty acids in numerous other plant matrices in the food supplements and pharmaceuticals sector. We develop customised methods that are precisely tailored to your requirements. Our experienced team works closely with you to develop and validate the best method for your specific matrix.

**We would be delighted to help you find solutions. Your contacts at PhytoLab:**



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