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ANALYTICAL EXPERTISE IN THE FIELD OF PLANT STEROLS AND PLANT STANOLS AND ANALYSES RELATED TO FATS AND OILS

About us

Eurofins Scientific Finland Oy is a 30-person Food & Feed Testing production unit in Raisio, Finland. We have a long experience in the field of analyzing plant sterols/stanols as well as fats and oils. This is due to our background being previously part of Raisio Group and Raisio's rapeseed oil and Benecol innovations.

Our offer to you

There is strong scientific evidence that plant stanols and plant sterols containing foods lower blood cholesterol levels and, therefore, reduce the coronary heart disease incidence risk. Our laboratory has analytical expertise related to both sterol/stanol ingredient analyses (sterol/stanol powders and steryl/stanyl esters) as well as analyzing plant sterol/stanol enriched food products.

We offer different kind of analytical approaches for plant sterol/stanol containing samples as presented in Fig. 1.

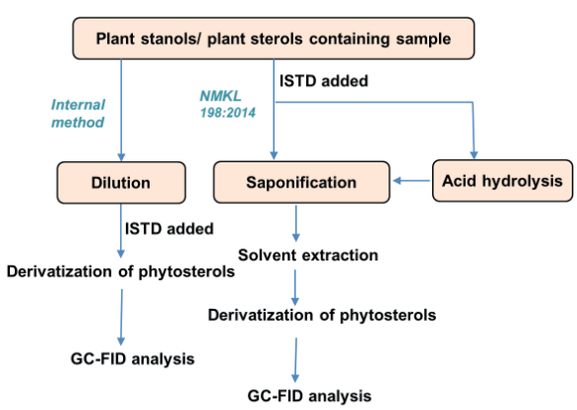

Figure 1: Analytical protocols for phytosterol analyses.

Food and feed samples are analyzed according to NMKL 198:2014 GC-FID method. Saponification approach is the proper choice for most sterol/stanol enriched food matrices such as yoghurt, yoghurt drinks, milk, juices, drinks, spreads, cheese. If the food contains cereals and specially if the food is heat treated, then acid hydrolysis step is most likely needed to break the matrix and liberate matrix incorporated lipids including phytosterols. We also recommend acid hydrolysis approach to be used for feed samples.

Sterol/stanol ester ingredient samples are analyzed similarly to food samples according to NMKL 198:2014. Sterol raw materials containing >80 % sterols in free form (not esterified) do not require saponification and are analyzed with our internal method (GC-FID) by preparing a proper sample dilution prior to TMS derivatization of sterols.

Quantitative determination of plant sterols and plant stanols as their trimethylsilyl (TMS) derivatives is carried out by GC-FID using 5b-cholestan-3a-ol (CAS 516-92-7) as an internal standard. In addition to quantitative sterol contents, GC analysis provides also information on the distribution of individual sterol components in the sample.

In the field of fats and oils, we provide all traditional fats and oils quality measures such as peroxide value, p-anisidine value, free fatty acids, colour and Karl Fisher water content mainly done according to AOCS methods. Furthermore, we offer fatty acid analyses from C4 to C22 including also cis- and trans- isomer separations of 18:1, 18:2 and 18:3 fatty acids. For example, erucic acid (22:1n-9) content is an important quality measure for rapeseed oils whereas polyunsaturated fatty acids and especially n-3 fatty acids, such as 22:5n-3 (EPA) and 22:6n-3 (DHA), are of special importance in certain applications and in case of fish oils. We generate the fatty acid methyl esters (FAMEs) either by base-catalyzed transesterification with CH_3ONa or by saponification followed by Boron trifluoride-methanol (BF_3) methylation depending on the sample type in question. Our fatty acid analyses follow the guidelines presented in ISO 12966-1:2014.

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TEST PORTFOLIO examples

Sterol analyses

Food samples with added phytosterols			
Test code	**Matrix**	**Method**	**TAT**
FL022 (a) Plant sterols and stanols	e.g. yoghurts, yoghurt drinks, milk, juices, spreads, cheese	NMKL 198:2014, GC-FID	10 d
FL024 (a) Plant sterols and stanols	Cereals, heat processed foods	NMKL 198:2014, GC-FID	14 d
FL025 Plant sterols and stanols	Candies, samples rich in sugars such as sweets, toffee, chews	NMKL 198:2014, GC-FID	10 d
Food samples with natural phytosterol levels			
Test code	**Matrix**	**Method**	**TAT**
FL023 (a) Plant sterols and stanols	Non-enriched foods, vegetable oils (not suitable for olive oil, algae and mushrooms)	NMKL 198:2014, GC-FID	10 d
FL026 (a) Cholesterol	Samples containing cholesterol	NMKL 198:2014, GC-FID	10 d
FL024 (a) Plant sterols and stanols	Cereals, heat processed foods	NMKL 198:2014, GC-FID	14 d
Sterol ingredients			
Test code	**Matrix**	**Method**	**TAT**
FL022 Plant sterols and stanols	Stanyl/steryl fatty acid esters	NMKL 198:2014, GC-FID	10 d
FL027 Plant sterols and stanols (raw materials)	Sterol ingredients (powders, prills etc.) containing > 80% sterols	in-house method, GC-FID	10 d

Fat and oil analyses

Traditional fats and oils analyses			
Test code	**Matrix**	**Method**	**TAT**
FL001 (a) Peroxide value	Fats and oils, food and feed	AOCS Cd 8b-90, mod.	7 d
FL003 (a) Free fatty acids **FL004** (a) Acid value	Fats and oils, food and feed	AOCS Ca 5a-40, mod.	7 d
FL002 p-Anisidine value	Fats and oils, food and feed	AOCS Cd 18-90	10 d
FL005 Karl Fisher water	Fats and oils	AOCS Ca 2e-84	7 d
Fatty acid analyses			
Test code	**Matrix**		**TAT**
FL018 (a) Fatty acid composition (%, cis, trans)	Fats and oils, food and feed	in-house method, GC-FID (transesterification)	10 d
FL019 (a) Fatty acid composition (%)	Fats and oils, food and feed	in-house method, GC-FID (transesterification)	10 d
FL062 Fatty acid profile (%, cis, trans)	Fats and oils, food and feed	IUPAC 2.301 mod. GC-FID (saponification + BF_3 meth.)	10 d

(a) Accredited test SFS EN ISO/IEC 17025:2005 FINAS T089
RUSH analyses are possible for all tests presented in the table. Test code for RUSH order is **FL100**.

Contact us

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TEST SELECTION GUIDE FOR PHYTOSTEROL ANALYSES