

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

## Introduction

Eurofins has three production sites in Finland – Raisio, Kokkola and Mikkeli. Our main Food&Agro site locates in **Raisio** providing chemical and microbiological analyses to our customers. Total number of staff currently in Finland is around 85 persons.

## Analytical expertise

We have a strong and long analytical experience in the field of analyzing plant sterols/stanols as well as fats and oils. This is due to Raisio Group's Rapeseed oil and Benecol innovations.

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 stanol/sterol ingredient analyses (sterol/stanol powders and stanyl/steryl esters) as well as analyzing plant sterol/stanol enriched food products.

We offer two different kinds of analytical approaches for plant sterol/stanol enriched food products analysed according to NMKL 198:2014 (Fig. 1).

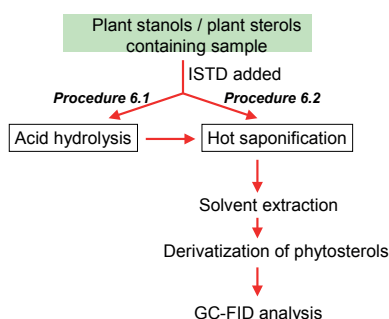


Figure 1: Analytical approaches applied for plant sterol/stanol analyses of food samples according to NMKL 198 method.

Saponification approach (proc. 6.2) 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 especially if the food is heat treated, then acid hydrolysis (proc. 6.1) 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.

Quantitative determination of plant stanols and plant sterols as their trimethylsilyl (TMS) derivatives using 5 $\beta$ -cholestan-3- $\alpha$ -ol (CAS 516-92-7) as an internal standard is carried out by GC-FID.

The 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 including cis- and trans- isomer separations. 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 are of special importance in certain applications and in case of fish oils. We generate the FAMES either by interesterification with CH<sub>3</sub>ONa or by saponification followed by e.g. BF<sub>3</sub> methylation depending on the sample type in question.

We also do solid fat content (SF %) measurements of fats/oils with NMR. This is an important analysis from technological point of view providing information on which proportion of the fat is in solid and which is in liquid stage at various temperatures.

## Test portfolio examples

Sterol Tests	Code	Matrix	TAT
<sup>a)</sup> Plant sterols and stanols (enriched products) – NMKL 198:2014, GC-FID	FL022	e.g. yoghurts, yoghurt drinks, milk, juices, spreads, cheese	10 d <sup>R</sup>
<sup>a)</sup> Plant sterols and stanols (not enriched products) – NMKL 198:2014, GC-FID	FL023	non-enriched foods, vegetable oils	10 d <sup>R</sup>
<sup>a)</sup> Plant sterols and stanols (cereal products) – NMKL 198:2014, GC-FID	FL024	Cereals, heat processed foods	14 d <sup>R</sup>
Plant sterols and stanols (raw materials) – in-house method, GC-FID	FL027	Sterol ingredients (powders, prills etc.)	10 d <sup>R</sup>
Fats and Oils Tests	Code	Matrix	TAT
<sup>a)</sup> Peroxide value, AOCS Cd 8b-90, mod.	FL001	Fats and oils	7 d <sup>R</sup>
<sup>a)</sup> Free fatty acids /Acid value, AOCS Ca 5a-40, mod.	FL003 / FL004	Fats and oils	7 d <sup>R</sup>
p-Anisidine value, AOCS Cd 18-90	FL002	Fats and oils	10 d <sup>R</sup>
Karl Fisher water, AOCS Ca 2e-84	FL005	Fats and oils	7 d <sup>R</sup>
Solid fat content (SF%), ISO 8292:1991E, mod.	FL008	Fats and oils	8 d <sup>R</sup>
Chlorophyll, AOCS Cc 13d-55	FL013	Oils	10 d
Insoluble impurities, AOCS Ca 3a-46	FL011	Fats and oils	10 d
Fatty Acid Tests	Code	Matrix	TAT
<sup>a)</sup> Fatty acid composition (%), cis, trans), GC-FID	FL018	food and feed	10 d <sup>R</sup>
<sup>a)</sup> Fatty acid composition (%), GC-FID	FL019	food and feed	10 d <sup>R</sup>
<sup>a)</sup> Erucic acid, GC-FID	FL059	fats and oils	10 d <sup>R</sup>

<sup>a)</sup> accredited test, <sup>R</sup>rush analysis possible

## Contact us

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