

GOED Technical Committee - Minutes

Date: September 4, 2025

PRESENT (please let us know if you were present, but not listed below)

Jenna Ritter (*chair* – Nature’s Way of Canada)
 Manuel Reyes (Colpex)
 Tim Johanek (Carlson Laboratories)
 Simone Staiger (Eurofins)
 Dimitri Sclabos (Tharos)
 Daniel Bohlen (KD Pharma)
 Juergen Gierke (BASF)
 Tony Bimbo (International Fisheries)
 Yutong Wang (Nutrasource/SGS)
 Maria Svantesson (MBP Solutions)
 Geir Frode Olsen (Epax Norway/Pelagia)
 Gerhard Kohn (Vesteraalens)
 Guro Solberg (Pharma Marine)
 Crispulo Gallegos-Montes (Fresenius Kabi)
 Gaige Pyatt (Nutrasource/SGS)
 Lina Cekaite (Aker Biomarine)
 Ingjerd Lystad (Pharma Marine)
 Alphard Orot (Aker Biomarine)
 Marita Buarø (GC Rieber/Vivomega)
 Helen Albans (Croda)
 Tina Vestland (Golden Omega)
 Ida Aspmo (KD Pharma)

Vibeke Bløndal (BASF)
 Mina Fakhary (Pharmavite)
 Henriette Meiser-Zessner (KD Pharma)
 Adin Smith (Nordic Naturals)
 Ágata Szygula (TASA)
 Christine Bousses (Fermentalg)
 Kenny Sharp (dsm-firmenich)
 Katrina Bartley (Nutrasource)
 Rafael Lozada (Henry Lamotte Oils)
 Roberto Valenzuela (Innocon)
 Miguel Carillo (TASA)
 Ainara García García (KD Pharma)
 Jennifer May (dsm-firmenich)
 Ivana Kostic (Colpex)
 Tanya MacGillivray (Mara Renewables)
 Keith Persons (Eurofins)
 Fernando Miranda del Solar (Austral)
 Gladys Cchahuantico (Copeinca)
 Nils Billecke (Cargill)
 Sonia Casanova (Copeinca)
 Osvaldo Barraza (Naturmega)
 ua74?

GOED Staff:

Gerard Bannenberg (GOED)
 Harry Rice (GOED)

Ellen Schutt (GOED)
 Gaby Cortez (GOED)

Guests:

Rene Notebaart (Corbion)

Absented:

Michelle Stout (Amway)
 Jonathan Cortes Linero (Naturmega)
 Hyun-Ah Kim (Nutrasource/SGS)
 Guido Medina (Pesquera Diamante)
 Krystalia Sarigiannidou (Novonesis)
 Eline Verbaanderd (Friesland Campina)

Adam Ismail (KD Pharma)
 Marie-Sophie Tangen (Orivo)
 Ilco Boogers (Corbion)
 Kirsten Humphreys (Bare Biology)
 Thomas Ringheim-Bakken (Arctic Bioscience)

Invitees for this call:

Jeroen de Wilde (OMind Science)

Michel van Overbeek (OMind Science)

Christophe Mellon (OMind Science)

Harald Svensen (Epax Norway/Pelagia)

Approval of Agenda and Minutes (Jenna Ritter - committee chair)

- Any comments on the minutes of the last meeting?
 - *No comments*. The minutes of the last meeting were approved.
- The agenda and meeting documentation were sent out on Sept 2nd, 2025. Any additions or changes?
 - The agenda was approved.

New Technical Committee Members (Jenna Ritter)

- **New members of the Technical Committee**
 - Giovana Camarotte (Veramaris) – *not present*
- **Members who have left the committee:**
 - **Joan de Jong (Bioriginal)**
 - **Jenna** – We like to thank Joan for all his support of the Technical Committee

Monograph/Pharmacopeia Updates (Gerard Bannenberg - GOED)

- **Publication of a novel method for very-long chain omega-3 polyunsaturated fatty acids (n-3 VLC-PUFA) in fish oils (Harald Svensen – Epax Norway)**
 - Harald gave a short presentation covering a new method for the quantification of n-3 VLC-PUFA in fish oils they have developed, and its validation. Reference – Svensen H, Olsen GF and Haugen J-E, *Eur J Lipid Sci Technol*, Aug 25, 2025 - [link](#) (free access).

TABLE 11 | Very long-chain polyunsaturated fatty acids (VLC-PUFAs) quantified by the method.

Fatty acid	Fatty acid
C24:6 <i>n</i> – 3	C28:8 <i>n</i> – 3
C24:5 <i>n</i> – 3	C28:6 <i>n</i> – 3
C24:4 <i>n</i> – 3	C28:5 <i>n</i> – 3
C26:7 <i>n</i> – 3	C28:4 <i>n</i> – 3
C26:6 <i>n</i> – 3	C30:8 <i>n</i> – 3
C26:5 <i>n</i> – 3	C30:6 <i>n</i> – 3
C26:4 <i>n</i> – 3	C30:5 <i>n</i> – 3

- **MOH interferences identification project (Gerard)**
 - **Gerard Bannenberg (GOED)** – We have recently started a small project in GOED that aims to identify the interferences present in the quantification of mineral oil hydrocarbons (MOH), as far as possible. In the quantification by LC-GC-FID of MOSH and MOAH in EPA/DHA omega-3 oils it is frequently observed that there are many other substances that are not MOSH or MOAH, visible as signals (peaks) on top of the hump that is integrated between C10 and C50. Many of these substances will probably also contribute to the hump itself. We have little insight into the chemical nature and structures of the majority of these interferences, and where they stem from, and how they differ between different types of omega-3 oils. It is often said that these are natural, or biogenic, substances that end up in the MOSH and MOAH fractions. Theoretically, some of these interferences might also be generated during processing or during sample preparation. Without a GC x GC- FID analysis these substances cannot be measured separately from MOSH or MOAH, or only partially removed from the hump signal by removing the peaks sitting on top of the hump. Much variability between labs also happens on how to deal with these interferences.

This study may provide us with arguments to discuss with the EC to indicate that the standard methods for MOSH and MOAH are not selective. The results may possibly also be useful for members to consider for improving their oil processing or other operations to reduce specific types of interferences. And thirdly, perhaps the results point to the possibility of making specific improvements in the sample preparation and analytics when analyzing EPA/DHA omega-3 oils.

We have created a new entry on our webpage “MOH resources” called “Interferences found in EPA/DHA Omega-3 Oils” - [Link](#), where the results of the various experiments will be placed. If you are curious, have a look. For now, the results of the first analysis of a pair of crude anchovy oil and the corresponding refined oil are summarized there, as well as a general introduction and discussion. I will populate this page with further results as we progress this year.

In the first experiment we have used a GC-EI-MS approach in combination with mass spectral matching to the NIST database. That has led to the tentative identification of a range of substances for both the crude and the refined oil. Three types of matching scores are given, with only those substances listed that surpass a minimum threshold for one type called the AMDIS score. Take note that the chromatograms are extremely crowded with many overlapping substances eluting from the GC. It is likely that the compounds we have found so far are types of compounds that easily stabilize the EI ionic charge and that many compounds still go undetected. Also, the higher the score the better for identification, but compounds with lower scores probably mean that we are looking at isomers or structurally similar substances. All in all, the putative identifications give a first idea about what types of compounds and families of substances are among the interferences.

Some conclusions from this first analysis is that substances in the crude oil and in the refined oil are largely distinct, with few substances that are present in both. We will see if this pattern is again seen in next experiments. Have a look at the webpage for the list of tentatively identified substances in both oils. The most striking observation so far is the presence of a range of fatty aldehydes in the crude oil, and a set of fatty acid ethyl esters in the refined oil. Such may reflect secondary oxidation products in the crude oil. For the refined oil, the fatty acids likely reflect formation during its sample preparation (after ruling out some other possibilities), due to the presence of ethanol used in the saponification step and the particular pH and emulsification condition achieved here that may allow a transesterification to effectively compete with the intended hydrolysis reaction.

One can already speculate a bit what implications these findings may have. For example, considering protecting the oils from further oxidation during the sample preparation, and optimizing the pH and emulsification conditions to avoid that fatty acid ethyl esters can be formed during saponification. Proving this will require separate studies with well-controlled conditions to see if that would indeed reduce the MOH signals by lowering interference levels. For now, we are just mapping what interferences we can identify in omega-3 oil samples prepared for MOH analysis, as a first step. To that end, upcoming experiments will take a closer look at interferences present in individual MOSH and MOAH fractions, comparing the GC-EI-MS approach with GC x GC-TOF-MS identification, repeating the

work in additional anchovy oils (also from different producers), and look at other fish oils, such as cod liver oil and tuna oil.

- **Tanya MacGillivray (Mara Renewables)** – if I wanted to refer to those slides, are they available?
- **Gerard** – The results you can find on that new webpage. The slides I just prepared for today's meeting – there is not some official slide deck, this is preliminary. Contact me after the meeting to see what I can share with you.
- **Tanya** – Regarding the secondary oxidation products, these may be present in especially the crude oil, and also in the refined oil, in the first place.
- **Gerard** – Correct. At this stage, we don't know to what extent the existing oxidation products are showing up in the MOSH and MOAH analysis. It could well be that part is reflected here. In addition, it is possible that part of those is lost in the sample preparation steps, while additional oxidation may again occur during the some of the (quite harsh) sample preparation steps if the samples are not specifically handled to prevent or limit new oxidation of any remaining polyunsaturated fatty acids. All this remains to be confirmed, and it is the first time that we have seen these substances in this type of analysis.
- Feel free to follow up with me if you have specific questions. This work is done in collaboration with members that supply the oils for testing who pitch in with paying for the testing costs. This work is pretty expensive and we appreciate all the support from members, and stay within the budget we have.

Legislative Updates (Gerard Bannenberg)

All Other Business (Jenna Ritter)

- **Updated technical guidance on trans fatty acids analytical methods for EPA/DHA oils (member question – Ida Aspmodal, KD Pharma)**
 - **Gerard** – In the last two meetings we discussed if there are any updates on method for trans fatty acids in EPA/DHA omega-3 oils. We asked the committee for any information on new developments in trans fatty acid analysis but did not receive any. I would like to close this discussion and come back to this in the future when we learn more or anything new. The conclusion today remains that Nofima Biolab in Norway remains the laboratory with the only suitable method for trans fatty acid analysis in EPA/DHA omega-3 oils, and in practice members send their samples there if they want to have reliable results.

- **Henriette Meiser-Zessner (KD Pharma)** –Is there a method reference in the European regulations which method should be applied for EPA/DHA oils? Does anyone know? Is the Nofima method the one that we should be using when we need to follow the regulations?
- **Gerard** – Several years ago we reached out to the European Commission exactly to ask which method we should be using for our oils, and the we never received a reply, even after repeated requests. The impression is that nobody knows there what method should be used.
- **Geir Frode Olsen (Epax Norway)** – I know that there are some methods for vegetable oils, and they will not work for fish oil. No need to try. We need a special method for fish oil.
- **Tanya** – Are you referring to the ones based on 18:1?
- **Geir Frode** – I am not sure. Many years ago, we asked Eurofins and we got a really strange result with a method for vegetable oil. That was the only time we tried it.
- **Henriette** – I know the methods are not comparable, also from past experience. It is interesting that there is a regulation for food that you have to stay below a limit, but without any method reference.
- **Geir Frode** – To make a method that separates the isomers for EPA and DHA is not very difficult, but you don't have any standards. You can generate trans fatty acids in a sample by making a bad oil.
- **Gerard** – I like to refer to the minutes of our last meeting. There are methods for dairy and vegetable oils based on measuring trans fatty acid derived from mono-unsaturated fatty acids, linoleic acid and alpha-linolenic acid, but they don't serve for fish oil because you are missing all the relevant trans fatty acids.
- **Tanya** – Has there been any discussion about the meaning behind the trans regulation and whether that applies to a mono-trans PUFA? When trans testing originated, there was a concern that these trans monounsaturated fats were essentially worse than saturated fats, whereas when you have one trans double bond among five or six, do they have the same implications? And that may be why the regulators never got back to you, because there is no real data on it.
- **Gerard** – Yes, exactly. We are kind of stuck in this situation since about 2019 or so, and there are no advancements. Except for the method that Nofima Biolab has developed and offers to anyone who is interested. Nofima Biolab actually does sell the standards for several trans-EPA and trans-DHA isomers, so if you want to set up your own method, that would be possible.
- **Technical publications notification**
 - **Gerard** – We have sent you with the agenda our compilation of recent technical publication in the EPA/DHA field. Harald and Geir Frode's publication is listed here as well, among many reports on new formulations, microbial sources of omega-3 and analytical approaches. Have a look to see if there is anything of interest to you.

Presentation:

“Innovating Edible Oil Refining using OMind’s E-OASIS Technology” - Christophe Mellon & Jeroen de Wilde, OMind Science, Canada

A pdf copy of the slides will be distributed with the minutes, and a copy of the presentation will be uploaded to our GOED Presentations folder ([link](#)) after the meeting.

Q&A

- **Jennifer May (dsm-firmenich)** – Thanks for a very interesting presentation. It would be very interesting to see how this technology applies to something like a highly colored oil with a high Anisidine Value, like a crude tuna oil. I am curious to see what would happen.
- **Christophe** – You have our contact details on the last slide. We would also be interested in exploring that, for example the change in color, and keep that in line with what is commercially relevant.
- **Jeroen** – Happy to work on that colored oil, just reach out.
- **Geir Frode** – How much oil do you need to run an experiment?
- **Christophe** – One liter is probably the minimum, and four is plenty. And if we are happy with the outcome, the most we can do is probably 1500 liters. Generally, we do 7 liters when we first scale up.
- **Henriette** – The material you are using is a standard material for the food industry?
- **Christophe** – We don’t want to reveal too much, but we wanted to make sure it was available in multi-ton amounts, and it was proven acceptable in other sectors, like the beverage industry and others.
- **Henriette** – Food conformity is good then?
- **Christophe** – Yes.

End of meeting.

Summary of Action Items

- **Action item** – *none*

Date of next meeting

- The next Technical Committee meeting will be scheduled for Thursday, October 16th, 2025.

USEFUL LINKS:

- Useful documents that the committee has discussed can be found in the Technical Committee folder. You can upload any material there yourself as well:
<https://drive.google.com/drive/folders/0B-5CurmVIvvETm1Wd29xemU5YVUU>
- Past minutes can be found here:
 - 2025 - https://drive.google.com/drive/folders/1st1PlkU7Z0_3Phy4uya_ucmc34ThuWrG?usp=drive_link
 - 2024 - https://drive.google.com/drive/folders/16WcCbtwh_NY09cnx-pEpnANbubBv7Wmo?usp=drive_link
 - 2023 - https://drive.google.com/drive/folders/1Q_aJTzxZL106KkZJUkgrkLT2MdgDiEXh?usp=share_link
 - 2022 - <https://drive.google.com/drive/folders/1Pt8CJafBCjIYalZF0ZJ08csPqlzW5XaC?usp=sharing>
 - 2021 - <https://drive.google.com/drive/folders/1VGy-t4TuWtDUB30jU98unIxWYzpnZuNj?usp=sharing>
 - 2020 - https://drive.google.com/open?id=1olF0Ab9UeGO_VaQpSshICS3xn0V8IiLK
 - 2019 - <https://drive.google.com/drive/folders/0B0usR2nagMSpSU1aaTR6Ty0yTE0>
 - 2018 - <https://drive.google.com/open?id=1lXXmBgN3F9XwZnXKxqq0hwC-oLZl9rc>
 - 2017 - <https://drive.google.com/drive/folders/0B6uJWj5y9FY9NDRRS2IVdUQ1ZWw>
 - 2016 - <https://drive.google.com/drive/folders/0B6uJWj5y9FY9UVZpU3NLejBIMEk>
- GOED Presentations - [GOED Presentations \(goedomega3.com\)](https://goedomega3.com)
- GOED Newsletters: If you do not receive newsletters from GOED, please sign up since this is our best way of communicating with members. Here is the link:
<https://goedomega3.com/members/subscribing-goed-current>