

GOED Technical Committee - Minutes

Date: April 24, 2025

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

Tony Bimbo (International Fisheries)	Christine Bousses (Fermentalg)
Jorge Sepúlveda (Innocon)	Helen Albans (Croda)
Geir Frode Olsen (Epax Norway/Pelagia)	Rafa Gracia (Solutex)
Guro Solberg (Pharma Marine)	Kenny Sharp (dsm-firmenich)
Marie-Sophie Tangen (Orivo)	William Yip (Aker Biomarine)
Tommy Power (Supplement Certified)	Ivana Kostic (Colpex)
Meagan Eggebeen (Amway)	Jennifer May (dsm-firmenich)
Magdalena Sobieska-Pietrzak (GC Rieber)	Gaige Pyatt (Nutrasource/SGS)
Gerhard Kohn (Vesteraalens)	Jiyoo Baek (Nutrasource/SGS)
Roger Johan Pettersen (Holtermann)	Katrina Bartley (Nutrasource/SGS)
Tim Johanek (Carlson Laboratories)	Davina Nagington (Croda)
Fernando Miranda (Austral Group)	Marita Buarø (GC Rieber/Vivomega)
Miguel Carillo (TASA)	Vibeke Bløndal (BASF)
Ainara García García (KD Pharma)	Yutong Wang (Nutrasource/SGS)
Marvin Boyd (Aker Biomarine)	Claus-Michael Brieber (Henry Lamotte Oils)
Christine Krumbholz (KD Pharma)	Roberto Valenzuela (Innocon)
Heike Meyer (Imperial Oel)	Nils Billecke (Cargill)
Tanya MacGillivray (Mara Renewables)	Boriana Bedjova (HuveNutra)
Agata Szygula (TASA)	Hyun-Ah Kim (Nutrasource/SGS)
Anthony Bible (Wiley Companies)	Sonia Casanova (Copeinca)
Brad DaDalt (Jamieson Laboratories)	Elizabeth Reyes (Colpex)
Henriette Meiser-Zessner (KD Pharma)	Marco Figari (TASA)
Lina Cekaite (Aker Biomarine)	Maria Svantesson (MBP Solutions)

GOED Staff:

Gerard Bannenberg (GOED)
Gaby Cortez (GOED)

Harry Rice (GOED)
Ellen Schutt (GOED)

Guests:

Absented:

Jenna Ritter (*chair* – Nature's Way of Canada)
Chris Gearheart (GOED)
Guy Ben-Zvi (Omega-3 Galil)
Kirsten Humphreys (Bare Biology)
Lilian Thiaux (Olvea)
John Nolan (Supplement Certified)

Roberto Fronzoni (KD Pharma)
Bas Arntz (Novosana)
Ingjerd Lystad (Pharma Marine)
Frank Möllering (NutriSwiss)
Janet Coonan (Jamieson Labs)
Simone Staiger (Eurofins)

Adam Ismail (KD Pharma)
 Eline Verbaanderd (Friesland Campina)
 Johannes Kraft (Evonik)

Invitees for this call:

Guillaume Le Page (Molydal Lubrication Solutions)

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 March 11th, 2025. Any additions or changes?
 - The agenda was approved.

New Technical Committee Members (Jenna Ritter)

- **New members of the Technical Committee**
 - **Marie-Sophie Tangen (Orivo)** – I am a German chemist, and I have been living in Norway for 10 years. In January I started working at Orivo as their Analytical Service manager. I am handling all samples and have responsibility for analysis and reporting.
 - **Tommy Power (Supplement Certified)** – Hi. I work at Supplement Certified here in the south-east of Ireland. I am a Quality Control Analyst. I have taken over from Kelly Han to attend these meetings. Looking forward to it.
 - **Gaige Pyatt (Nutrasource/SGS)** – I work at Nutrasource in the certifications department. I look forward to attending these meetings.
 - **Jiyoo Baek (Nutrasource/SGS)** - I am with SGS Nutrasource, working in the Product Certification team. My main focus is generating IFOS reports after data analysis and communicating with our lovely clients. For my PhD, I studied the development of Pickering emulsions for encapsulating functional substances such as probiotics, vitamins, and other bioactive ingredients.
 - **Neeti Chavan (Camlin Fine Sciences)** - *not present*
 - **Ainara García García (KD Pharma)** – I work for KD Norway as Quality & Development Manager. I have been involved in the omega-3 business for 11 years now in different positions, from lab engineer to product development.
 - **Kirsten Humphreys (Bare Biology)** - *not present*
 - **Tanya MacGillivray (Mara Renewables)** – I work for Mara Renewables, here in Canada. I am a senior scientist in the analytical department with R&D. I have been working in the omega-3 space for about 25 years.

- **Members who have left the committee:**
 - **Kelly Han (Supplement Certified)**
 - **Andrea Cecilia Kokkinou (HBI Eurocaps)**
 - **Gerard** – We like to thank you both for your support to this committee.

Monograph/Pharmacopeia Updates (Gerard Bannenberg - GOED)

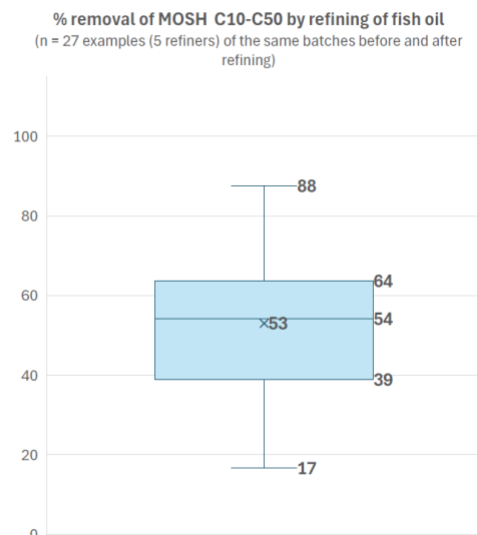
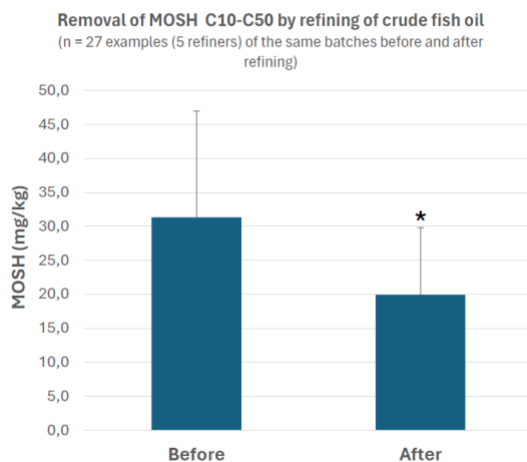
- **Summary report ISO 12966-4 method evaluation**
 - **Gerard** – In the beginning of this year, we assembled a small working group (WG) of seven analytical chemists who are all part of the Technical Committee. This group made a previous evaluation of two methods for the suitability of EPA/DHA quantification in omega-3 oils last year (see report here - [link](#)). This time we asked the WG to evaluate method ISO 12966-4 – *“Animal and Vegetable Fats and Oils – Gas Chromatography of Fatty Acid methyl Esters – Part 4: determination by Capillary Gas Chromatography”*. This method is important for FOSFA ([link](#)), an organization that gave a presentation to this committee about a year ago and asked for our feedback regarding the high variability in results for EPA and DHA quantification in fish oils by FOSFA-associated laboratories using this method. We provided some initial feedback to FOSFA last year but thought it would be good to make a more formal evaluation of this method by experienced analytical chemists and following prespecified criteria. You can see here (*shown on screen*) the first page of the summary report that the WG has prepared based on the individual evaluations.
 - A copy of this report will be distributed to the Technical Committee after today’s meeting for your feedback, in case anybody has any. Please do so within the next two weeks, and then we will proceed making any edits, or if there are no suggestions for changes, move forward to uploading the report on our website as a new technical report ([link](#)).
- **Action item** – Review the WG summary report of method ISO 12966-4 evaluation, and proceed with making a final version (**Technical Committee members, Gerard**)
- **Guidance Documents update – Other omega-3 fatty acids calculation**
 - **Gerard** –As most of you know, but perhaps not all new members do – in GOED we have the GOED Monograph as our quality standard, but we also have the “Guidance Documents” ([link](#)) that contains information that supports the GOED Monograph and provides useful information about methods that are of relevance to testing EPA/DHA omega-3 oils, as well

as descriptions of many types of omega-3 oils. The Guidance Documents contain useful information on quantifying omega-3 fatty acids in EPA/DHA omega-3 oils. The current update is specifically about how to calculate the levels of omega-3 long-chain polyunsaturated fatty acids that are not EPA or DHA, but which do contribute to what we call “Total Omega-3”. These five other fatty acids are alpha-linolenic acid (ALA; C18:3 n-3), stearidonic acid (SDA; C18:4 n-3), eicosatetraenoic acid omega-3 (ETA; C20:4 n-3), heneicosapentaenoic acid (C21:5 n-3) and docosapentaenoic acid omega-3 (DPA; C22:5 n-3). On page 9 of the newly updated Guidance Documents ([link](#)), you can find the description of the calculation for each fatty acid, useful to those analysts that do want to calculate the levels of any of these five fatty acids specifically. We discussed this update in the past few meetings, and the text we approved has now been included.

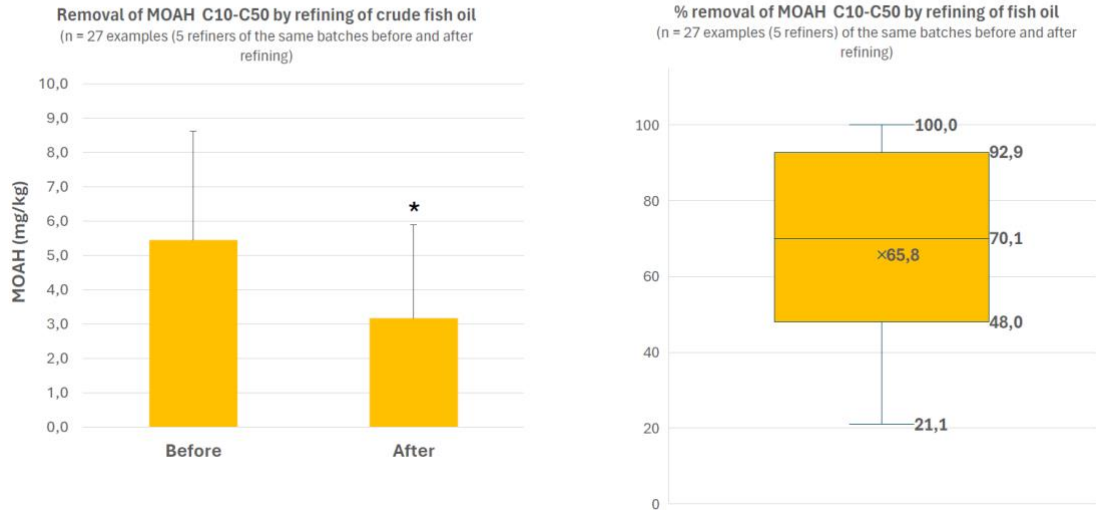
Legislative Updates (Gerard Bannenberg)

- **Results of MOH removal through refining & discuss MOH mitigation activities by supply chain position (Gerard & Tina Vestland, Golden Omega)**
 - **Gerard** – I am showing here (*shown on screen*) a summary of occurrence data that I have requested over the past few weeks from refiners in the GOED membership. Feedback was received from five fish oil refiners and specifically shows pairs of crude unrefined fish oil and the corresponding refined fish oil. The results for a total of 27 such pairs are shown in the following graphs.

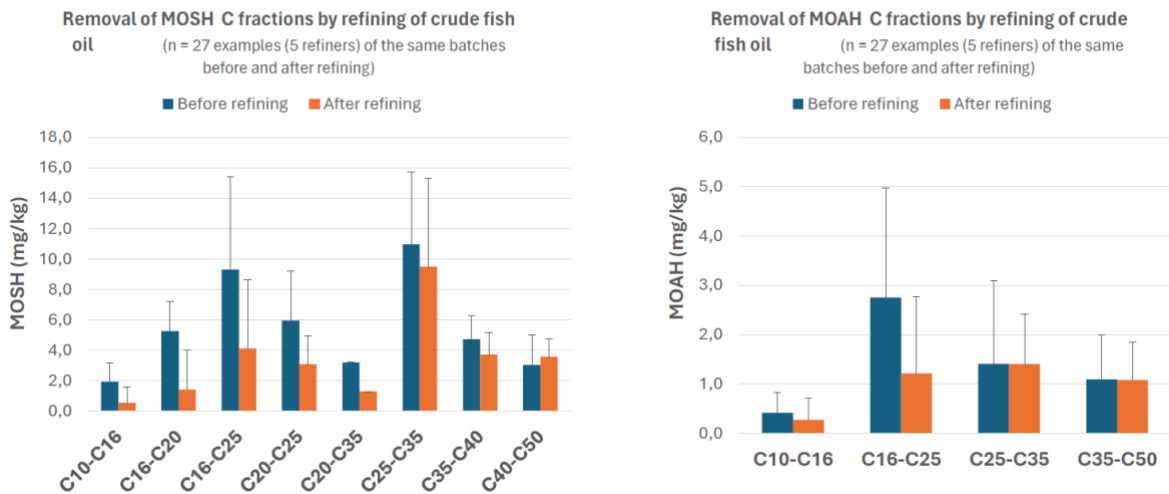
GOED TECHNICAL COMMITTEE – NOT FOR DISTRIBUTION



GOED TECHNICAL COMMITTEE – NOT FOR DISTRIBUTION



GOED TECHNICAL COMMITTEE – NOT FOR DISTRIBUTION



You can see that, based on this data, a reduction in approximately half of the MOSH and MOAH burden (C10-C50 integrated) is achieved by current fish oil refining. There is a considerable range in the removal success for individual batches. You can appreciate that on the one hand refining is helpful in mitigation of these contaminants, but that on the other hand this removal is incomplete. The results illustrate what has been reported by individual refiners over the past years, that mineral oil hydrocarbons with more than about 25 carbons cannot be removed by current fish oil refining methods.

You can also see that these data for MOAH show that levels will be meeting the proposed maximum level (ML) of 10 mg/kg expected to be enforced in the EU in 2027, but that not all

batches would be meeting a stricter ML of 5 mg/kg expected for 2030. Do note that this is just a small set of results.

We recently received a comment from one refiner about the need for crude oil producers to not walk away from understanding where MOH contamination in crude oils originates and trying to mitigate MOH levels before an oil gets to a refiner. The reason for this argument is because refiners can only remove MOH to some extent, as shown here. On the other hand, crude oil producers have recently expressed concern to GOED about the possible extension of the proposed ML for MOAH to crude unrefined fish oils. A MOAH ML for crude oils would be a challenge, particularly from 2030 onwards when the ML would be lowered to 5 mg/kg. I do remind people that the currently proposed limits are far more achievable than what was on the table up to a year ago, with a ML of 2 mg/kg for MOAH (and which is the current harmonized action limit by EU Member States). This discussion indicates that different stakeholders in the EPA/DHA omega-3 oil supply chain each have their own concerns and challenges, which ultimately stem from the EC's desire to regulate mineral oil contamination throughout food and ingredient supply chains and not only in the final consumer products.

- **Gerard** – Any comments or questions? (*no comments from the committee*). I hope that more members can submit results for such paired observations, to strengthen this dataset. Such results will be very helpful for GOED to have when the expected stakeholder consultation opens within the next months with a new proposal by the European Commission for regulating these contaminants. We may want to make the argument that limits should not be set for crude unrefined fish oils, but we need to see first what the proposal is actually going to say when published.
- **Fernando Miranda (Austral Group)** – That is clear about the length of the molecule. But the question about the number of rings in MOAH, is that still in the table to be defined some limit for that? It is clear that MOSH is not an issue right now – there is a recommendation value. For MOAH the proposed limit is 10 mg/kg, later going down to 5 mg/kg. But the story of the number of rings, is that still on the table for review? And maybe needs to be defined in the future – did you hear anything about that? Because in the refining process it is possible to remove up to C25, but the question is, are the molecules that have more than 2 rings between C10 to C25, or C25 to C50? I don't know.
- **Gerard** – You can roughly calculate that; a 3-ring system has 18 minus 4 carbons, so is C14. But many MOAH molecules are branched compounds, with side chains sticking out of the cyclic structures. So, the number of carbons can be substantially higher than just the rings alone. So, I would think that C25 and up have at least about 4 rings, and that it is the compounds with at least 3 or 4 rings that cannot be effectively removed by fish oil refining currently.

We have not heard about any specific regulations for 3- or more ring MOAH. I think it was said that additional toxicology studies are still needed to understand the health risk of these compounds. I do not have any concrete information about that.

- **Vibeke Bløndal (BASF)** – About refining – what processes are you referring to, or just the deacidification process?
- **Gerard** – I left it open what people meant by refining, because otherwise it would be impossible to summarize these data since different refiners employ different processes. The amount of data is also limited to focus on a particular processing step. I assume that with a full refining people look at deacidification, water washing, phospholipid removal, bleaching and molecular distillation, and perhaps other steps, or changes in the order of some of these steps. I am not a specialist in this, and I did not collect information about any specific refining processes used by each refiner submitting data. So, the data shown here comprise any approaches that could be used in a refining process going from a crude unrefined fish oil to a fully refined oil.
- **Jennifer May (dsm-firmenich)** – My understanding is that refining specifically for mineral oil removal would have to involve some elevated temperatures. Like a deodorization-type of treatment. Does anyone have any more information about that?
- **Tanya MacGillivray (Mara Renewables)** – Definitely temperature-related.
- **Jennifer** – So, it walks a fine line between mineral oil removal and the possibility of MCPD generation.
- **Tanya** – Absolutely.
- **Gerard** – If anyone has additional occurrence data for such paired observations of crude and refined fish oils, please forward to me. It will be helpful for us to get a good impression of where we are today in our industry.
- **Marco Figari (TASA)** – It would be very useful if we can differentiate what technologies have the best result for MOAH reduction, if not complicated by having not much data. Another question is whether we have the same summary for concentration processes? Because that is a different kind of process, and a different kind of behavior of MOAH reduction.
- **Gerard** – Good questions. I usually don't receive information on the exact refining methodologies employed, and importantly the specific conditions used. A lot of that information is also proprietary to individual companies. We could try to make an outreach to figure out what are the best approaches. I am not sure we are going to receive much feedback. Regarding the second question, we have not looked at reductions in MOH levels by EPA/DHA concentration processes specifically. I don't have the impression from occurrence data received about concentrates that members are particularly concerned. Starting levels of refined fish oils for the production of concentrates are, as shown here, likely in the range of < 2 mg/kg up to say 6 mg/kg for MOAH. But I can include an action item to follow up on this specifically.
- **Agata Szygula (TASA)** – How can we be sure that the C25-C50 fraction is really MOAH?
- **Gerard** – Valid question, and we return to this doubt we have at every meeting. We are aware of the potential of having interference in the analytical method for MOAH quantification. Currently, we can't easily distinguish MOAH from biogenic and other

interferences – one needs to do the confirmatory analysis by LC - GCxGC - TOF-MS/FID by specialist laboratories to determine the presence of interferences and quantify their contribution to the C10-C50 integrated signal obtained by LC-GC-FID. For the data shown here, members who supplied these data did not mention having looked at confirming or ruling out that these were interferences, so I assume that we are looking at MOAH. But as you say, we can't be sure.

- **Agata** – It is very important to be sure, in order to design any removal process, and understand where any contamination is coming from. Just looking for the carbon number is not enough. We are not finding a contamination source.
- **Gerard** – I think everybody can agree with that. If you observe levels > 2 mg/kg or any level that you deem of concern, for example > 5 mg/kg, or > 10 mg/kg, discuss with your laboratory and ask for confirmatory analysis to confirm that it is indeed MOAH you are looking at, and identify any interferences present.
- **Jennifer** – I also highly recommend checking your raw materials. Even materials you think are not likely to contain mineral oil. We have seen that batch to batch, and even drum to drum, testing is required to understand where contamination is coming from.
- **Action item** – Refiners to submit occurrence data for paired observations of crude unrefined and corresponding refined fish oils / Review changes in MOH levels in production of EPA/DHA omega-3 concentrates (**GOED Technical Committee / Gerard**)
- **Canada PFAS measures**
 - **Gerard** – The Canadian Government is moving to regulate PFAS. A phased approach was recently published (March 2025 - [link](#)) announcing that in the second phase, in 2027, regulations will be announced for natural health products, food additives and non-industrial food contact materials. In a third phase also industrial food contact materials will be regulated, with the date for that still to be announced.
- **European Commission consultation on ML for 3-MCPD in oil blends & ML for glycidyl-esters in compound foods with > 5% fat**
 - **Gerard** – In our News Alert yesterday ([link](#)), we informed everybody about a targeted stakeholder consultation by the European Commission (EC) for 3-MCPD and glycidyl-esters in so-called compound foods. We understand such foods composed of multiple ingredients, for example a functional food containing an omega-3 oil. There is a proposal for maximum limits, which you see in the table (check the news alert). Som for example for fish oils and oils from other marine organisms, the ML is 2500 µg/kg fat, which is the same ML as currently established for such oils. For glycidyl-esters the ML is 1000 µg/kg fat, also

matching the currently regulated ML for fish oils. Different limits are proposed for compound foods containing blends of oils.

If you have any comments about this stakeholder consultation, please provide feedback to us by May 2. If so, do indicate what compound food your comments apply to, and support your arguments with relevant occurrence data.

- **Action item** – Evaluate if the proposed MLs for 3-MCPD and glycidyl-esters for compound foods are of relevance to you, and submit any comments to Gerard Bannenberg or Harry Rice (harry@goedomega3.com) (**GOED Technical Committee**)

All Other Business (Gerard Bannenberg)

- **Method for EPA & DHA in gummies (member question)**
 - **Gerard** – We received a member question – which laboratories can test EPA and DHA content of gummies? If so, what methods are used, and if these are on scope of the laboratories' ISO 17025 accreditation? If you have any information, please provide that to Gerard. If sufficient information can be collected, I can share a summary with the Technical Committee in an upcoming meeting (**GOED Technical Committee**)
- **Action item** - Send any information about laboratories testing EPA/DHA content of gummies, methods used, and if on scope of ISO 17025 accreditation, to Gerard (**GOED Technical Committee**)
- **Food additives list revision (Harry Rice & Gaby Cortez, GOED)**
 - **Harry Rice (GOED)** – On April 17th, you have received an email with an attachment containing a list of food additives. This is for the Global Omega-3 Navigator, which is our online database for regulatory and technical information ([link](#)). We are going to focus first on food additives that are antioxidants. We may add additional food additives after that. For that reason, we have separated out the function of antioxidants from others. We just wanted to make sure that we categorized the food additives correctly. So, we sent out this list and have received some feedback so far. If anybody else has any feedback on the list, please let us know.
- **Action item** – Provide any feedback you have on the list of food additives to Harry Rice (harry@goedomega3.com) (**GOED Technical Committee**)

- **Best-practice approaches to avoiding Peroxide Value increases in a set of omega-3 samples analyzed sequentially (member question)**

- **Gerard** – We received another member question. It is a topic that pops up now and then and is about oxidation that occurs in the laboratory. The member had the following question: *“I have been curious about something that the committee may have thoughts on - we send all raw materials/finished goods out for 3rd party testing for PV and fatty acids. I’ve noticed that sometimes PV comes in unexpectedly high, usually when it is listed further down on the sample sheet (i.e. samples at the top of the list are low and increase as you go down the list). I think this suggests that the analyst is weighing out all samples at once then letting them sit on the bench while they work through the titrations. The samples absolutely oxidize as they’re sitting, especially high concentrates. Do you think this is something the committee would have an interest in commenting on? I’m curious what the typical procedure is, as I was trained to weigh, then immediately titrate.”*

Just for context, we (the Technical Committee) have developed a document a few years ago about oxidation control – the “*GOED Best-Practice Guidelines on Oxidation Control*” ([link](#)), which you can find on our website. However, we don’t have specific information or guidance on how a lab should best handle samples that need to be analyzed sequentially. So, I was thinking of asking committee members here who have experience in measuring Peroxide Value in particular, to share their best-practice tips for this. We could combine that information into a short text about what are the best ways to do this analysis and avoid inadvertent oxidation and then include that in our industry advisory document. If that sounds like something that is of value. I will make the request after this meeting.

- **Action item** – Reach out to the Technical Committee about best-practice guidance on oxidation control for laboratory samples in Peroxide Value testing (**Gerard/GOED Technical Committee**)

- **Technical publications notification**

- **Gerard** – You have received together with the agenda the usual list of recent technical publications. Have a look for yourself if there may be something of interest to you there.

- **GOED at AOCS Annual Meeting 2025**

- **Gerard** – We just like to mention that both Harry Rice and I will be at the upcoming Annual Meeting of AOCS in Portland OR, next week ([link](#)). It would be nice meeting any committee members who are there.

Presentation:

" MOSH-MOAH-POSH-free Lubrication Solutions " – Guillaume Le Page, Molydal Lubrication Solutions. Saint-Maximin, France

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

- *No questions*

End of meeting.

Summary of Action Items

- **Action item** – Review the WG summary report of method ISO 12966-4 evaluation (**Technical Committee members, GOED**)
- **Action item** – Refiners to submit occurrence data for paired observations of crude unrefined and corresponding refined fish oils / Review changes in MOH levels in production of EPA/DHA omega-3 concentrates (**GOED Technical Committee / Gerard**)
- **Action item** – Evaluate if the proposed MLs for 3-MCPD and glycidyl-esters for compound foods are of relevance to you, and submit any comments to Gerard Bannenberg or Harry Rice (harry@goedomega3.com) (**GOED Technical Committee**)
- **Action item** - Send any information about laboratories testing EPA/DHA content of gummies, methods used, and if on scope of ISO 17025 accreditation, to Gerard (**GOED Technical Committee**)
- **Action item** – Provide any feedback you have on the list of food additives to Harry Rice (harry@goedomega3.com) (**GOED Technical Committee**)
- **Action item** – Reach out to the Technical Committee about best-practice guidance on oxidation control for laboratory samples in Peroxide Value testing (**Gerard/GOED Technical Committee**)

Date of next meeting

- The next Technical Committee meeting will be scheduled for Thursday, June 5th, 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_VaQpSshICS3xn0V8liLK
 2019 - <https://drive.google.com/drive/folders/0B0usR2nagMSpSU1aaTR6Ty0yTE0>
 2018 - https://drive.google.com/open?id=1lXXmBgN3F9XwZnXKxqq0hwC-oLZl9rc_
 2017 - https://drive.google.com/drive/folders/0B6uJWj5y9FY9NDRRS2IVdUQ1ZW_s
 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>