GOED Technical Committee - Minutes

Date: March 13, 2025

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

Jenna Ritter (*chair* – Nature's Way of Canada)
Elizabeth Reyes (Colpex)
Geir Frode Olsen (Epax Norway/Pelagia)
Andrew Jenkins (Lipid Analytical Labs)
Jorge Sepúlveda (Innocon)
Simone Staiger (Eurofins)
Tony Bimbo (International Fisheries)
Dimitri Sclabos (Tharos)
Mia Brastad (Zooca)
Lilian Thiaux (Olvea)
Mina Fakhary (Pharmavite)
Magdalena Sobieska-Pietrzak (GC Rieber)
Ingjerd Lystad (Pharma Marine)
Mohamed Koroma (Pharmavite)
Vibeke Bløndal (BASF)
Guro Solberg (Pharma Marine)
Yutong Wang (Nutrasource/SGS)
Roberto Fronzoni (KD Pharma)
Anthony Bible (Wiley Companies)
Meagan Eggebeen (Amway)
Bas Arntz (Novosana)
Roberto Valenzuela (Innocon)
Juergen Gierke (BASF)
William Yip (Aker Biomarine9
Helen Albans (Croda)
Miguel Carillo (TASA)
Kenny Sharp (dsm-firmenich)
Hyun-Ah Kim (Nutrasource/SGS)
Huw Watkins (EuroCaps)
Cecilia Kokkinou (EuroCaps)
Arnar Halldórsson (Lysi)
Keith Persons (Eurofins)
Veronika Ulstein (KD Pharma)
Katrina Bartley (Nutrasource)
Ida Aspmodal (KD Pharma)
Haraldur Sigurjónsson (Lysi)
Ivana Kostic (Colpex)
Tina Vestland (Golden Omega)
Henriette Meiser-Zessner (KD Pharma)
Frank Möllering (NutriSwiss)
Manuel Reyes (Colpex)
Alfonso Prado-Cabrero (Supplement Certified)
Stig Jansson (Grøntvedt)
Sonia Casanova (Copeinca)
Marita Buarø (GC Rieber/Vivomega)
Neeti Chavan (Camlin Fine Sciences)
Carol Locke (Omega Natural Science)
Ágata Szygula (TASA)
Sunil Choudhary (Omega Natural Science)
Brad DaDalt (Jamieson Laboratories)
Kangming Ma (Eurofins)
Guido Medina (Pesquera Diamante)
Gladys Cchauntico (Copeinca)
Dorothy Dennis (Mara Renewables)
Eline Verbaanderd (Friesland Campina)
Davina Nagington (Croda)
Guido Medina (Pesquera Diamante)

GOED Staff:
Gerard Bannenberg (GOED)
Gaby Cortez (GOED)
Harry Rice (GOED)
Chris Gearheart (GOED)

Guests:
Daniel Bohlen (KD Pharma)

Absented:

Ellen Schutt (GOED)
Janet Coonan (Jamieson Labs)
Kaitlin Roke (GOED)
Johannes Kraft (Evonik)
Gerhard Kohn (Vesteraalens)
Maria Svantesson (MBP Solutions)
Christine Krumbholz (KD Pharma)
Kelly Han (Supplement Certified)

Invitees for this call:

Ria Sieg (Eurofins QTA)
Kirsten Kramer (Eurofins QTA)

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**
  - **Ainara García García (KD Pharma)** - *not present*
  - **Veronika Ulstein (KD Pharma) –** Hello. I started at the KD Pharma Norway site in January as Quality & Production Manager. Earlier I worked in a laboratory focusing on microbiology for three years.
  - **Neeti Chavan (Camlin Fine Sciences)** - *not present (joined later)*
  - **Kirsten Humphreys (Bare Biology)** - *not present*
  - **Tany MacGillivray (Mara Renewables)** - *not present*
- **Members who have left the committee:**
  - **Inge Bruheim (Rimfrost)**
  - **Luke MacPherson (Mara Renewables)**
  - **Chintan Shah (WR Grace)**
  - **Jenna –** We also want to thank the three members who have left the committee. Thank you for your contributions.

Monograph/Pharmacopeia Updates (Gerard Bannenberg - GOED)

- **Overview of 2024 Randomized Testing Program results**

- **Gerard –**As you know, GOED every year tests between 20 and 24 finished products from randomly chosen GOED members, in its Randomized Testing Program (link). Here I would like to give you a summary of the results we obtained in the completed 2024 RTP, which was recently completed:

Summary of 2024 GOED Randomized Testing Program (RTP) results:

For the 2024 program, 22 finished products were randomly chosen from current GOED members. They were purchased and tested for all aspects of quality as defined by the GOED Voluntary Monograph, including EPA/DHA content, oxidative quality and environmental contaminants. Eurofins (Hamburg, Germany) carried out the analysis. Products were transported and stored in their original packaging at room temperature protected from light until analysis.

Product origin (GOED member country):

Americas: USA 7

Asia/Middle East: China 2, Israel 1, South Korea 3, Thailand 1, Turkey 1

Australia/NZ: New Zealand 1

Europe: Germany 1, Italy 1, Norway 1, Poland 1, Spain 1

Summary of findings:

Omega-3 content label claim compliance:

Most products satisfactorily met the labeled amounts of omega-3 fatty acids:

Range between 94,8% and 141,1% of claimed EPA+DHA content

Two products had 84,7% and 85,6% of claimed content

Environmental contaminants:

All tested products (100%) complied with the GOED Monograph maximum limits for the following environmental contaminants:

- Dioxins and furans

- Dioxin-like PCBs

- Sum of dioxins, furans and PCBs

- Total PCBs (209 congeners)

- Heavy metals: lead, cadmium, mercury and inorganic arsenic

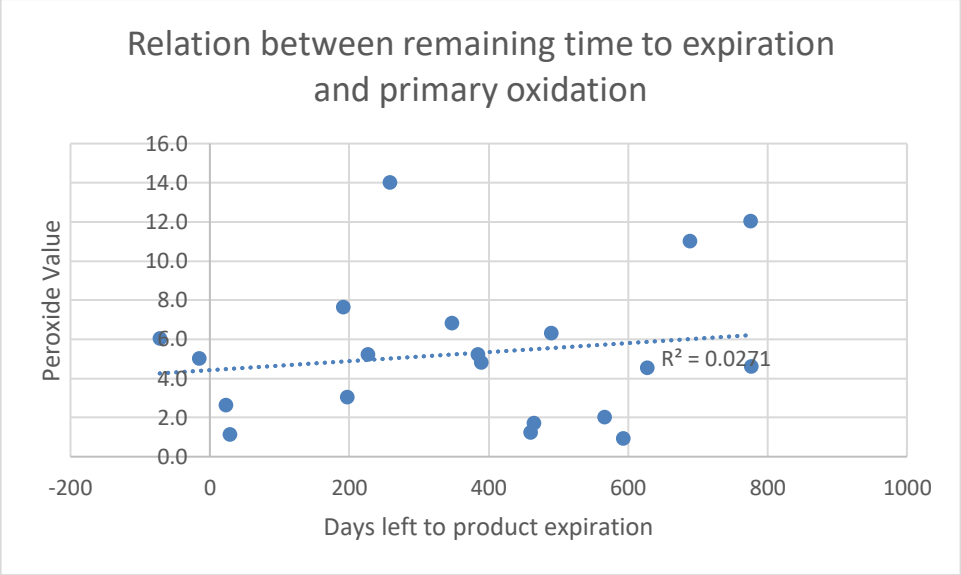
Oxidative quality:

Peroxide Value:

Of the 22 products tested, 12 products met a maximum Peroxide Value of 5 meq O2/kg.

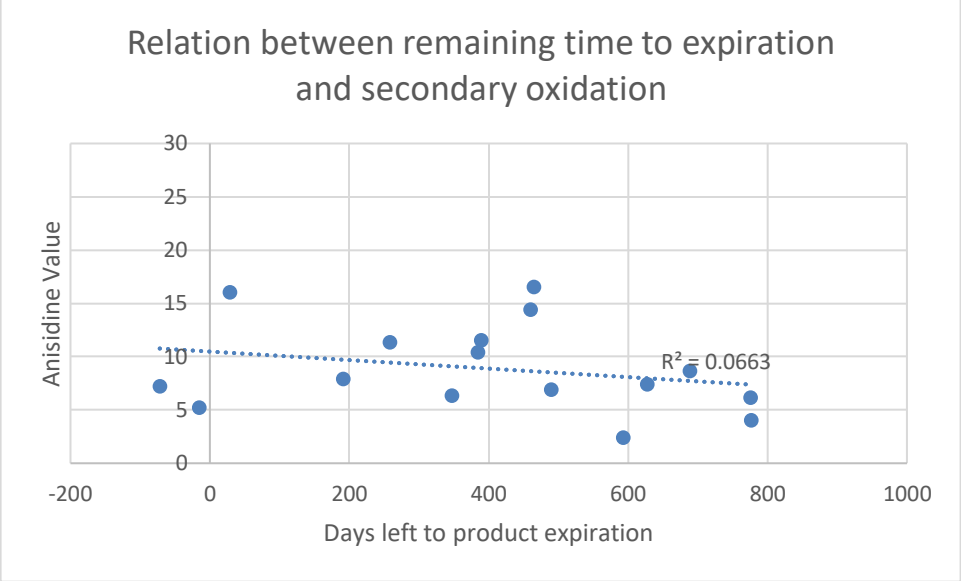
Seven products slightly exceeded this level (range 5.2 – 7.7 meq O2/kg)

Three products were found to have higher values (11 - 14 meq O2/kg).

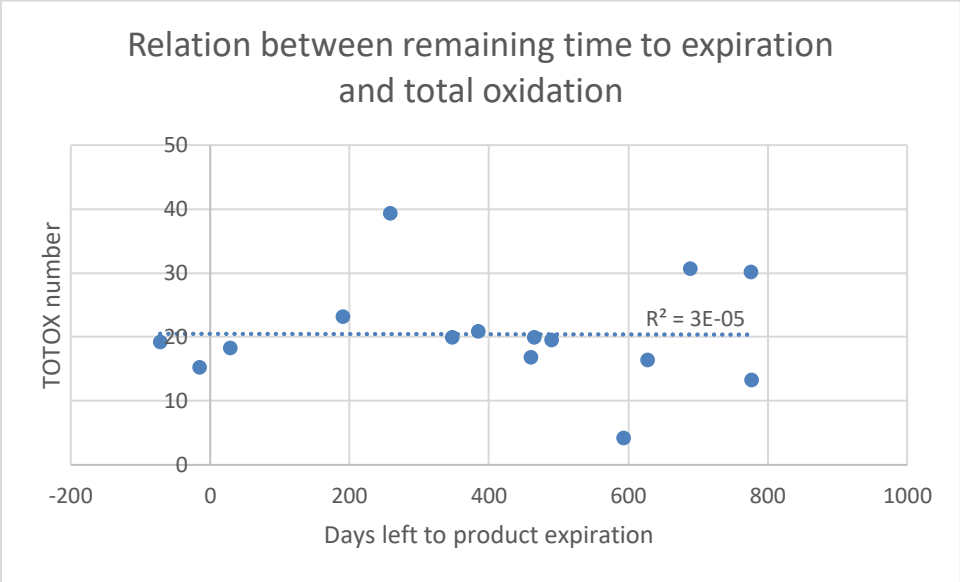


Anisidine Value:

All unflavored products met a maximum Anisidine Value of 20.



TOTOX number:



(only unflavored products shown)

Three unflavored products (21,4 %) exceeded the maximum Totox number of 26.

Other contaminants tested (not covered by the GOED Monograph):

Bisphenol A:

7 products (32%) with levels > LOQ. Average of all tested products: 0.8 ± 1.5 mg/kg. Highest observed level: 5,1 mg/kg

Note: In 2023 we had 20% of products > LOQ

3-MCPD and esters:

20 products (91%) with levels > LOQ. Average of all tested products: 304,0 ± 334.5 µg/kg. Highest observed level: 1500 µg/kg

Glycidyl esters:

20 products (91%) with levels > LOQ. Average of all tested products: 52,3 ± 45.8 µg/kg. Highest observed level: 200 µg/kg

MOSH:

All products (100%) with levels > LOQ. Average of all tested products: 481,8 ± 466.5 mg/kg. Nine products (41%) with levels out of upper range (> 1000 mg/kg). Lowest observed level 6,7 mg/kg.

MOAH:

16 products (73%) with levels > LOQ. Average of all tested products: 8,9 ± 11.6 mg/kg. Highest observed level 39,0 mg/kg.

Five of the 10 products (50%) sold in the EU have levels > 2 mg/kg (and three > 10 mg/kg)

Phthalates:

15 products (68%) with levels > LOQ. Number of phthalate species per product:

Zero phthalate species – 7 products

One phthalate species – 8 products

Two phthalate species – 1 - products

Three phthalate species – 2 products

Four phthalate species – 3 products

Five phthalate species – 1 product

Some products were found to contain specific phthalate species at considerable levels. The highest observed level was 11,0 mg/kg DINP (diisononyl phthalate)

For the first time, we have looked at brominated flame retardants in EPA/DHA omega-3 products. We did this because EFSA published various Scientific Opinions about these contaminants last year. We did not know what to expect, but here is a short summary:

Brominated flame retardants:

* PBDEs (polybrominated diphenyl ethers):

    14 products (64%) with levels > LOQ. Average of all tested products: 0,35 ± 0,84 ng/g. Highest observed level: 3,8 ng/g

* TBBPA (tetrabromobisphenol A):

    All products (100%) < LOQ

* HBCD (hexabromocyclododecane – alpha, beta, and gamma isomers):

    11 products (50%) with levels > LOQ. Average of all tested products: 0,13 ± 0,22 ng/g. Highest observed level: 0,85 ng/g

    Of these 11 products, all contained alpha-HBCD (0,12 ± 0,20 ng/g), and two also contained both beta-HBCD (0,07 and 0,02 ng/g) and gamma-HBCD (0,06 and 0,03 ng/g)

- **Gerard** - These results are of course from a limited set of just 22 products but provide us with new insights into various contaminant classes. If you have any questions, please reach out after the call.
- **Alfonso Prado-Cabrero (Supplement Certified)** - Why are the results for EPA and DHA shown together if they can be measured separately?
- **Gerard** - To not make this report too long today, I had chosen to show just several parameters. We also have the data for EPA and DHA alone, and for Total Omega-3. If you are interested, contact me after the meeting, and I can give you those values.
- **Arnar Halldórsson (Lysi)** - Will you be sharing this report with us?
- **Gerard** - Yes, in the minutes. You can also find a short summary about the GOED Monograph parameters here - link.
- **Arnar** – Regarding phthalates, there are Chinese limits. And they are very different depending on the type of phthalate. If you could show at least the number for at least DEHP, DINP and DPP. It would be interesting to compare these with the levels of phthalates found, or the average.
- *Note added to the minutes:* The maximum limit of phthalates in China are:

DEHP (di(2-ethylhexyl) phthalate)	max 1.5 mg/kg
DINP (di-isononyl phthalate	max 9.0 mg/kg
DBP (di-n-butyl phthalate)	max 0,3 mg/kg

Checking the RTP results, one product was found that would exceed the Chinese DEHP ML, and two products would exceed the ML for DINP. None of the tested products exceeded the ML for DBP.

Legislative Updates (Gerard Bannenberg)

- **MOH regulations update**

  - **Gerard –** I would like to provide an update about what we know about the discussions regarding upcoming regulations of mineral oil hydrocarbons (MOH) in Europe. Through information obtained from a European trade association, and the results of a Feb 6 meeting of FNCG (French edible oil association – link), FEDIOL (the European trade association for vegetable oil and protein meal industry - link) and the French ministry of Agriculture, we have learned more about the December 12-13, 2024 meeting of the European Commission's (EC) Expert Group on Industrial Contaminants and the Environment/ EU Member States Expert Group, leading to a better picture of what may be included in the next proposed EC regulation for MOH in fats and oils. Here is a table with the proposed maximum limits (MLs) for MOAH in various commodities, as far as we understand the situation today:

MOAH:

Products	Maximum MOAH limit as of 01/01/2027 (mg/kg)	Maximum MOAH limit as of 01/01/2028 (mg/kg)	Maximum MOAH limit as of 01/01/2029 (mg/kg)	Maximum MOAH limit as of 01/01/2030 (mg/kg)
Corn oil rapeseed oil sunflower oil soybean oil linseed oil	2			
Coconut oil peanut oil sesame oil	6	4		2
Grape seed oil cottonseed oil argan oil rice oil	10	5		2
Algae oils and fishery products (including marine oils)	10			5
Oils not listed above, including olive oil	4	2		
Olive pomace oils		10	5	2

1. The proposed maximum limit (ML) of 10 mg/kg will also be applicable to microalgal oils, which are now specifically mentioned.
2. Maintenance of a (favorable) maximum limit of 10 mg/kg for marine oils (to be enforced on 1 January 2027/ and lowered to 5 mg/kg from Jan 2030)
3. The limits may still be subject to change: Some Member States oppose the gradual progression of maximum thresholds
4. Thresholds will be applicable to imported crude oils (to prevent the placing on the market of non-compliant crude oils and to encourage third-country authorities to consider MOSH/MOAH cross-contamination in food products from origin countries). Oils exceeding the thresholds may still be imported, provided that effective decontamination can be justified before being placed on the market
5. Draft regulation on performance criteria/sampling procedures remains under discussion.
6. For blends of oils, a maximum threshold of 2 mg/kg would apply (for example, blends of different vegetable oils, or microalgal oils + fish oils)

MOSH:

- An increase in the planned recommendations (Indicative Limits):

Products	**MOSH <u>Recommendation</u> as of 01/01/2027 (mg/kg)**
Olive pomace, grape seed, cottonseed, cereal seed, safflower, essential oils, and **marine oils**	**50**
Olive, coconut, soybean oils, and other oils not listed in the 15 and 50 ppm categories	**30**
Corn, rapeseed, sunflower, and linseed oils	**15**

- Deduction of measurement uncertainties for MOSH will not be allowed.

    - Previously there were discussions to set this indicative limit for marine oils at 15 mg/kg. This appears to have been relaxed to 50 mg/kg. Such indicative limits are levels which if exceeded

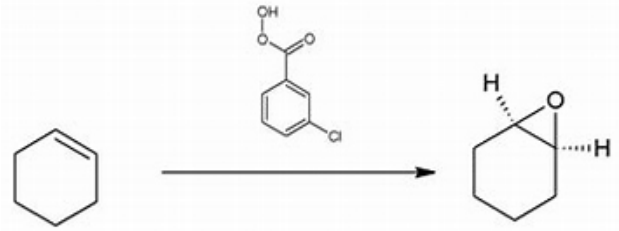
that the food authorities will get in touch with the brand or producer to determine how mitigation can be achieved.

- The next EU meeting will be on 18/03/25, but it is expected to focus primarily on additives. There is a draft regulation on additives, currently limited to emulsifiers and colorants. It is unclear at this moment if it will be applicable for antioxidants.
- An update to Regulation 333/2007, concerning the deduction of measurement uncertainties in official MOAH controls, is not yet published (*Commission Regulation (EC) No 333/2007 of 28 March 2007 – "Laying down the methods of sampling and analysis for the official control of the levels of lead, cadmium, mercury, inorganic tin, 3-MCPD and benzo(a)pyrene in foodstuffs"* – link). However, the principle of allowing this deduction of measurement uncertainties is confirmed for samples and analyses conducted by food authorities. There is still uncertainty regarding its applicability at the FBO (Food Business Operator) level.

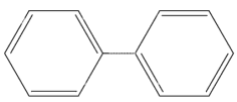
- **Miguel Carillo (TASA)** – The additives regulation is including refined fish oil?
- **Gerard** – As far as I know, refined fish oil itself is not within the scope of the MOH regulation for additives. But there may be additives in that regulation that are of relevance to refined fish oils, such as antioxidants.
- ***Question in the chat*** – Do we know how the MOH regulations will be enforced in the EU? How will food authorities carry out product sampling for MOH, for example the EU pulling random products or asking for provision of documentation upon reception?
- **Gerard** – I don't know that. But there will be a new stakeholder forum, likely before the summer. The EC is expected to then publish a Q&A document when the next open consultation opens with the new proposal for MOSH/MOAH regulation. Most likely this type of questions will be answered there.

- **MOH interferences identification**

  - **Gerard –** We have recently gained a little novel insight into the substances that can interfere with the analysis of MOAH. We have learned earlier that there is the possibility that natural substances present in omega-3 oils that behave like MOAH, often referred to as biogenic interference, can contribute to the MOAH signal. Quite sophisticated analysis is then necessary to quantify these and subtract these from the real MOAH signals contributing to the MOAH "hump". But now we have received information from one of our members that MOAH analytical interference can arise from the sample preparation epoxidation step. In the epoxidation step, the reagent m-CPBA (*meta*-chloroperoxybenzoic acid) is used to epoxidate olefins, which can then largely be removed ahead of the quantification of MOAH. Removal of olefins, which are not mineral oil aromatics hydrocarbons, can reduce the number of peaks contributing to the MOAH hump (C10-C50 signal). Here is an example of that reaction of a cyclic olefin with m-CPBA.



Eurofins (Moss, Norway) has now found that in the presence of sodium carbonate, which is used to avoid m-CPBA from precipitating out by making the reaction conditions alkaline, this epoxidation reaction leads to the formation of bi-phenyl and tri-phenyl (terphenyl) compounds, and that these are found in the MOAH C10-C50 hump. It was excluded that these bi- and triphenyl compounds originated from cross-contamination from laboratory consumables.



Some of the compounds identified by Eurofins:

3-chlorobiphenyl
2-chlorodiphenylmethane
4,4’-dichloro-1,1’-biphenyl
2,5’-dichloro-(1,1’-diphenyl)-4-ol
2,4,6-trichloro-1,1’,4’,1’’-terphenyl
2,5-dichloro-*p*-terphenyl
2,5,4’-trichloro-*p*-terphenyl

The biphenyl and triphenyl compounds are not biogenic substances but are created during the sample preparation. They were not observed when the epoxidation reaction was conducted in the absence of sodium carbonate. The laboratory believes that it is possible that batch variability in the m-CPBA reagent quality may contribute to variable results in MOAH quantification. Trace impurities and structural variations in the m-CPBA reagent may also be of relevance. mCPBA is used for many other chemical reactions, so it is possible that other unexpected reactions take place. Further research is necessary now to study the impact of the sample preparation in the generation of MOAH-positive substances, understand whether this is unique for EPA/DHA omega-3 oil samples or a more general phenomenon, and what the optimal sample preparation for omega-3 oils should be to avoid artificial generation of MOAH-like substance during sample preparation.

- **Inclusion of food additives in the GOED Global Omega-3 Navigator (Harry Rice, GOED)**

  - **Harry Rice (GOED) –** Hi everybody. Hopefully a majority of you were on the call last month when Gaby Cortez (GOED) did the demonstration of the Global Omega-3 Navigator (GO3N; link), which is our new interactive database for regulatory, technical and compositional information about omega-3s. If you were not let us know, and get in touch with me or Gaby, and we can give you the information we provided in the GOED Current. I highly recommend that you explore it. You can go on the website and use the GO3N – it is available to all members.
    We are finalizing a list of food additives that we are going to be including in the GO3N. These are food additives that are being used in omega-3-rich oils for their antioxidant properties. We may extend this at a future time to other food additives that have other purposes than antioxidation. Many may have been on the call when we first discussed this, but we are finalizing the list just now. Gerard will send this out with the minutes. The list started out with food additives listed by Codex. This has since been extended with food additives that are highlighted in red, and those are food additives that were listed in the Codex General Standard for Food Additives, but nobody has indicated that they are using them. Unless someone comes forward and tells us that they are using them, we are not going to include them in the database. So, I would encourage you to take a look at this list, let us know if you are using them. If there are food additives, antioxidants specifically, you are using that are not on this list, please let us know. This list has been through the Technical Committee once, and it has also been through the Regulatory Affairs Committee, and we are finalizing it now.

  - **Action item** – Review the list of food additives and provide feedback if you use any of those that are scheduled to be not included in the Global Omega-3 Navigator, or about any food additives that are in use but not included on the list (**Technical Committee members, GOED**)

All Other Business (Jenna Ritter)

- **2025-2026 Special Achievement Program open & flyer (Gerard)**

  - **Gerard –** By the end of June the current cycle of the Special Achievement Program (link), recognizing third-party testing laboratories that are highly accurate in the quantification of EPA and DHA in omega-3 oils, will finish. We currently have two awardees in this first 2024-2025 cycle of this program, namely KD LabService and Lipid Analytical Laboratories. For the next cycle, starting from July, we are welcoming new applications. So, as soon as you

receive the results from your participation in the AOCS GOED Nutraceutical Oils Laboratory Proficiency Program (LPP), and you believe you meet the criteria for the Special Achievement Program, please send me your application by email.
We have got a flyer (link), which you can download and distribute to your colleagues at any third-party testing laboratories you work with, to make them aware of this program.

- **Technical publications notification**
  - **Jenna –** You have had a chance to take a look at the list of recent publications that was sent out with the meeting agenda for this call. There are quite a few new publications, particularly on new sources. I suggest you take a look, I am sure you have lots of free time. We included the links, so it is easy to find the full text.

Presentation:

"Rapid IR-analysis for EPA/DHA omega-3 oil process control" – Ria DeCamp-Sieg, Eurofins QTA, West Chester, OH, USA

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

- **Tina Vestland (Golden Omega)** – Do you have any experience at all using this technology on powders containing omega-3 oils?
- **Ria** – Yes, you can do powders with it. For powders you would probably want to look at a near-IR instrument because that is really the only option you are going to have. But that should be something that should be measurable in a powder.
- **Tina** – Do you have any specific experience with powders already, or would this be new to you?
- **Ria** – It is a little bit difficult to answer because powders with EPA/DHA can come from many different sources. Typically, we would do this with canola, or with supplements. Those models would be very specific as to what the end-product is.
- **Tina -**
- **Gerard** – Can I just ask if the models for mid-IR and near-IR are meant to be a third-party testing option with people sending in samples for testing by Eurofins QTA, or are you commercializing these models so that companies can use them in-house for their own analyses in their own analytical department or for in-line monitoring?
- **Ria** – Actually, all of the above. My team at Eurofins specializes in on-site instrumentation. So, we would provide instrumentation to clients all around the world that want to use this,

and we would provide the modeling, we do all the calibration, etc. We can do third-party send-offs, and we can partner with other labs to have these on-site. So, if you want something that is quicker than your traditional send-out chemistry, you can get something quicker locally. But ultimately, this is more to educate and form, these options are out there. If you are having pain points in your turn-around time, whether you have an internal lab or an external lab, and you just want to make data-driven decisions – now this is not your golden standard - this is a great tool, whether you have it in-house or external, at a local lab, a "hub-lab" as we call it.

- **Gerard** – The model for EPA and DHA is very robustly validated with thousands of samples. Are all those other parameters validated with that many samples as well?
- **Ria** – Yes. I can't put all the parameters on one slide. This is a very robust validation.

End of meeting.

Summary of Action Items

- **Action item** – Review the list of food additives and provide feedback if you use any of those that are scheduled to be not included in the Global Omega-3 Navigator, or about any food additives that are in use but not included on the list (**Technical Committee members, GOED**)

Date of next meeting

- The next Technical Committee meeting will be scheduled for Thursday, April 24th, 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-5CurmVIvvETm1Wd29xemU5YVU

- 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/0B6uJWj5y9FY9NDRRS2lVdUQ1ZWs
2016 - https://drive.google.com/drive/folders/0B6uJWj5y9FY9UVZpU3NLejBIMEk

- GOED Presentations - GOED Presentations (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