

## WHY DO WE NEED TO VERIFY THE ORIGIN OF OMEGA-3 SUPPLEMENTS?

Today omega-3 supplements can be based on a variety of different sources (salmon oil from Norway, wild salmon oil from Alaska, cod liver oil from Iceland, anchovy oil from the South Pacific, krill oil from Antarctic waters, seal oil from Norway, algae oil from EU etc.). Not only because some of these sources contain more of the essential and healthy fatty acids than others. Also because many consumers prefer certain countries of origin or want the supplement to originate from an especially well managed fishery – or not from a fishery at all (vegan people). Common for all, is a desire to know the story behind the product, to get what they are paying for and a proof-positive evidence for the pure and single origin used in the product. Therefore, the scope of testing and certification of omega-3 supplements is mostly to confirm single origin products, but also target/main ingredient(s) in mixed products.



## TESTING SCOPE:

From February 2021 to April 2021 omega-3 supplements with a clear single origin claim for either salmon, krill or cod liver oil were purchased through China's largest e-commerce channel, TMALL and South East Asia's leading e-commerce channel, Lazada. All products were analysed with NMR (Nuclear Magnetic Resonance spectroscopy), a technology similar to MRI. The results were compared with the ORIVO database of reference fingerprints, and **a)** Confirmed as authentic: A match with claimed omega-3 category (species and geographic origin) or **b)** Categorized as a fake origin claim: A no-match or a match with a different omega-3 category than the one claimed.

|                    |   |
|--------------------|---|
| Tested products    | 19  |
| Test period        | February 2021 – April 2021  |
| Sales channels     | TMALL and Lazada  |
| Countries          | China and South-East Asia   |
| Product categories | Omega-3 supplements for humans based on salmon, krill and cod liver oil |



## REACH OUT TO GET CERTIFIED:

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# Omega-3 market screening: China and SEA – April 2021

## TESTING DETAILS:

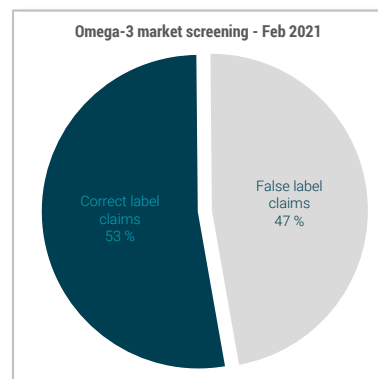
Tested products: **19**  
Category: **Omega-3 based on salmon, krill and cod liver oil**  
Sales channels: **TMALL and Lazada**  
Countries: **China and South-East Asia**  
Test period: **Feb 21 – Apr 21**  
Fraud rate: **47 %**

## METHODOLOGY:

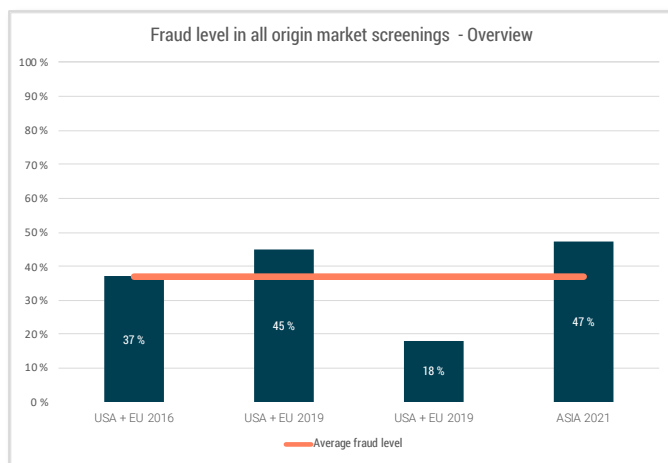
Since omega-3 supplements normally are 100% fat based, the fat component is the analytical target, and the technology of choice is NMR (Nuclear Magnetic Resonance spectroscopy). A raw data set from each sample/product is converted into so-called chemical fingerprints and compared with the ORIVO database of reference fingerprints. A positive match confirms the origin (species and geographic origin) of the product.

## RESULTS - 47% FRAUD:

- 5 of 5 (100%) salmon oil products contained no salmon oil but was instead found to be composed of fish oil from other sources or fish oil ethyl esters (not natural).
- 2 of 8 (25%) krill oil products contained no krill oil but was found to be diluted with vegetable oil or fish oil ethyl esters.
- 2 of 6 (33 %) cod liver oil products (CLO) contained no CLO but was found to be composed of fish oil from other sources.



## THE RESULTS COMPARED WITH SMILAR SCREENINGS.



*The average fraud rate for all ORIVO's omega-3 market screenings is 37%. In total almost 100 products have been tested through these four screenings. The fraud rate for this particular screening was 47%, clearly above the average.*

## CONCLUSIONS, WHAT DOES THE SCREENING RESULT MEAN?

This market screening of omega-3 confirms a well known hypothesis: Products claiming a high-priced ingredient are subject to adulteration. An economically motivated fraud where the claimed raw material is substituted with cheaper ones. All tested products are supposed to be composed of natural oils, but in almost half of the fraud cases, the adulterant is a concentrate (not natural). Ironically, the raw materials used are in most cases containing more of the active compounds EPA and DHA (the essential omega-3 fatty acids) than the claimed source. But also lacking other active compounds (astaxanthin, phospholipids, choline etc). Even though quality parameters such as oxidation was missing in our analysis scope, it is likely to believe that companies willing to cut corners on origin claims to maximise profit, also would be willing to cut corners on quality, for instance by using rancid fish oil.



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