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Intelligence

Nofima develops fast tests for fatty-acid composition in salmon fillets

3 January 2023

By Responsible Seafood Advocate

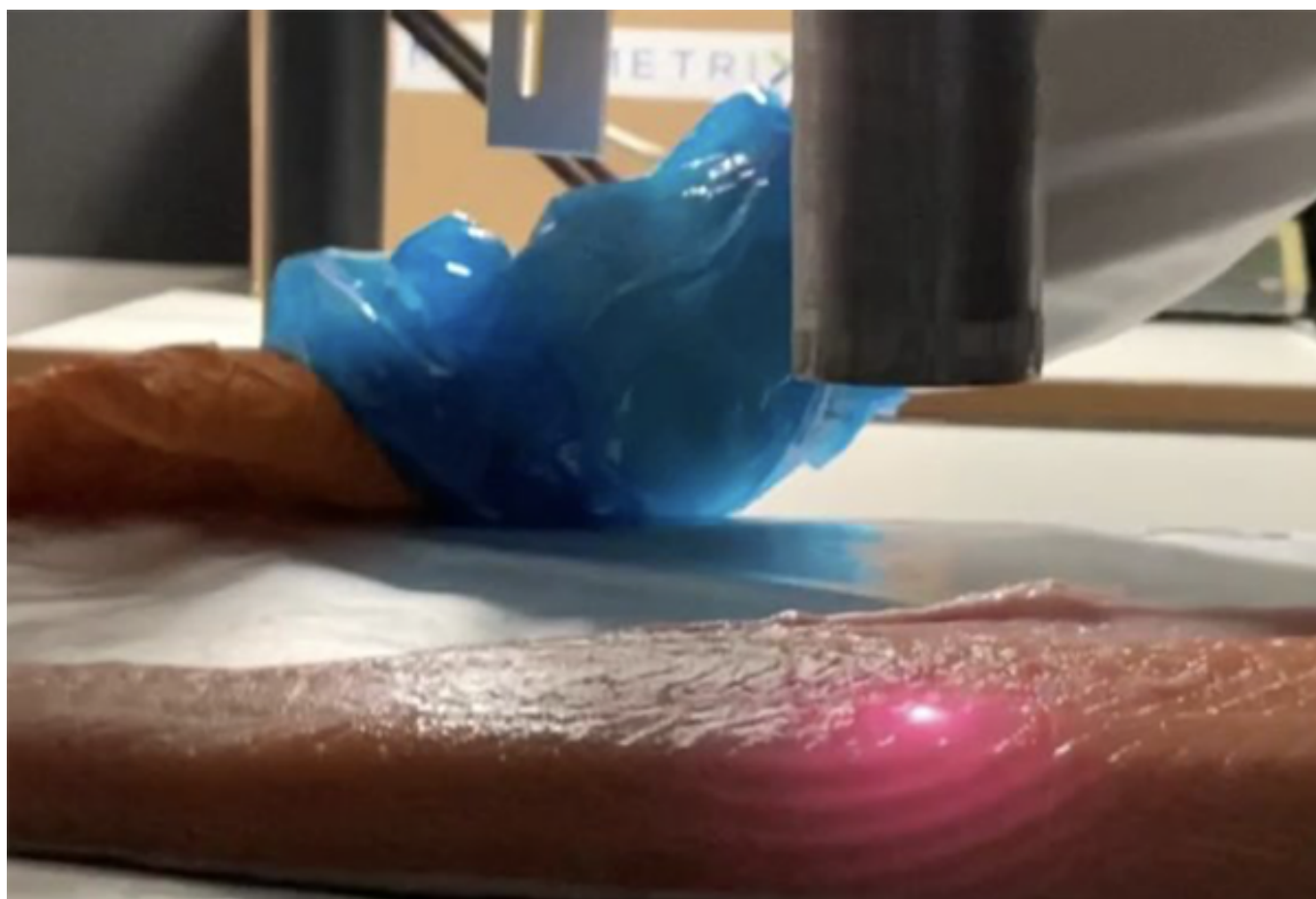
Raman and NIR technologies can produce fast and reliable results but cost remains a factor

Norwegian research institute Nofima has developed methods for the rapid measurement of omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) in salmon fillets.

Known to have wide-ranging benefits to human health, EPA and DHA content in farmed salmon has declined in recent years, says Nofima, due to the replacement of fishmeal and fish oil with plant-based proteins and oils.

The ability to measure EPA and DHA levels is useful to the industry, the research institute stated, because they are important markers in breeding and genetics and also because the information is in great demand from the marketplace.

Currently, the costly and time-consuming technology chromatography must be used to measure specific fatty acids can only be performed in specific laboratories; one measurement costs NOK 1500 (roughly US \$150) or more.



Norwegian research institute Nofima has developed methods for the rapid measurement of omega-3 fatty acids EPA and DHA in salmon fillets. Courtesy photo.



(<https://events.globalseafood.org/responsible-seafood-summit>).

Nofima says that Raman Spectroscopy and Near-Infrared (NIR) Spectroscopy get quick results without physically touching the product as a laser illuminates the fillet for contact-free scanning. Nofima says its testing method is accurate, reporting that EPA+DHA can be measured with an accuracy of approximately ± 0.5 percent of total fat. The typical variation range for EPA+DHA in salmon is 4 to 12 percent of total fat.

As of today, the method is excellent at making rapid measurements in a laboratory or next to the line in a production facility. In the slightly longer term, we envisage that Raman can also be put directly on the production line and measure each and every salmon fillet, but this might require robotic controlled measurements.

Relevant Raman measurement systems currently cost approximately NOK 700,000. This cost must be assessed in relation to the opportunities it can provide regarding effective quality documentation and possible quality differentiation.

Nofima is collaborating with geneticists to determine whether the method can be used directly in breeding work to select fish with the desired fat composition.

NIR imaging (hyperspectral) spectroscopy is already being used by the food industry to make in-line measurements. The method is used for measuring parameters such as fat in salmon fillets, fat in meat, protein in chicken fillets, as well as residual blood in whole white fish and salmon fillets.

Read the **full publication** (<https://nofima.com/publication/2088787/>).

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