

Fish quality measurement on Iceland



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Business developer, Skretting Salmon Innovation

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Fish quality program



Background

- Salmon is known for its healthy, nutritious and nice colored flesh
- The fish quality can be affected during production
- Need to document the fish quality (pigment, fat, fatty acids) for sales
- No rapid method available to check and verify fish quality locally (need to send the fish abroad today to get chemical pigment level – time consuming)



The concept

1. Collaboration with Matis: measure fish quality @ Island combined with use of Skretting NIR calibrations/fish quality database
2. Use shared data to understand mechanisms
3. Further develop the program for Salmon quality, recommendation and documentation

Skretting - long experience in Fish quality service



color PREMIUM™

Color
Premium
1998

Fish Flesh
Quality
Program
2018

Fish
Quality
2020

- Pigment
- Visual Color
- Fat

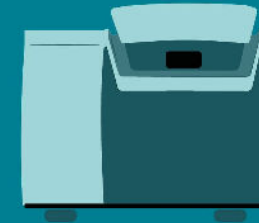
- Biometrics
- Fatty Acids

- New Quality Aspect

Skretting NIR

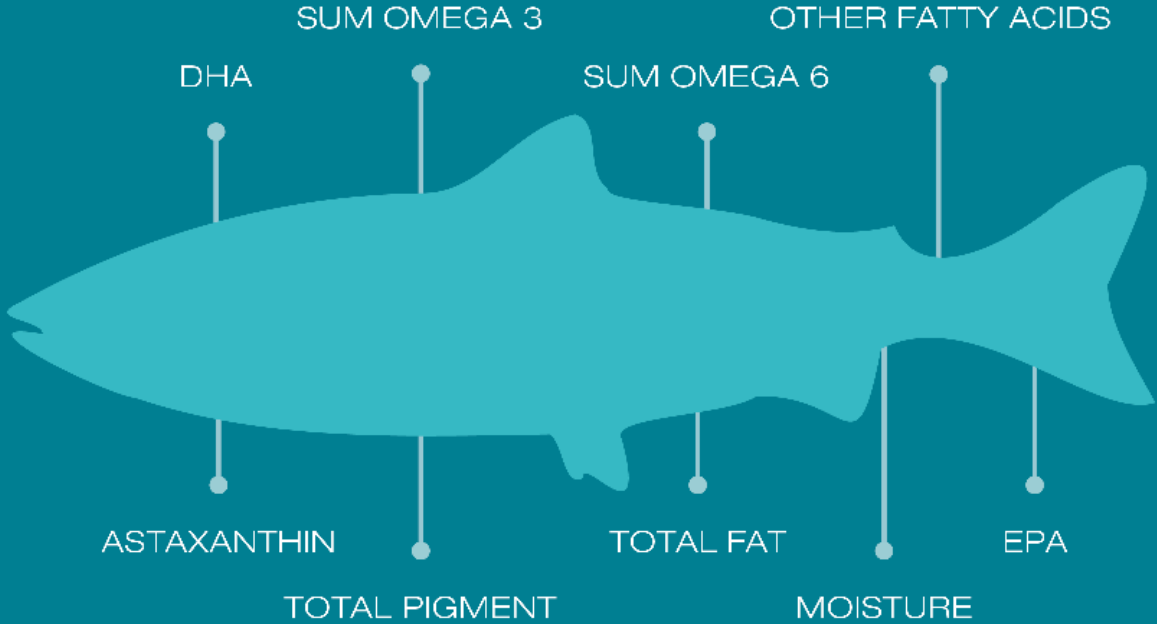
Near-Infrared Spectroscopy (NIR) is an **accurate and rapid analysis method**

- **Pigment**
- **Fat and fatty acids**



NIR
CALIBRATIONS
ALLOW
ANALYSING 8
PARAMETERS
IN 1 MINUTE

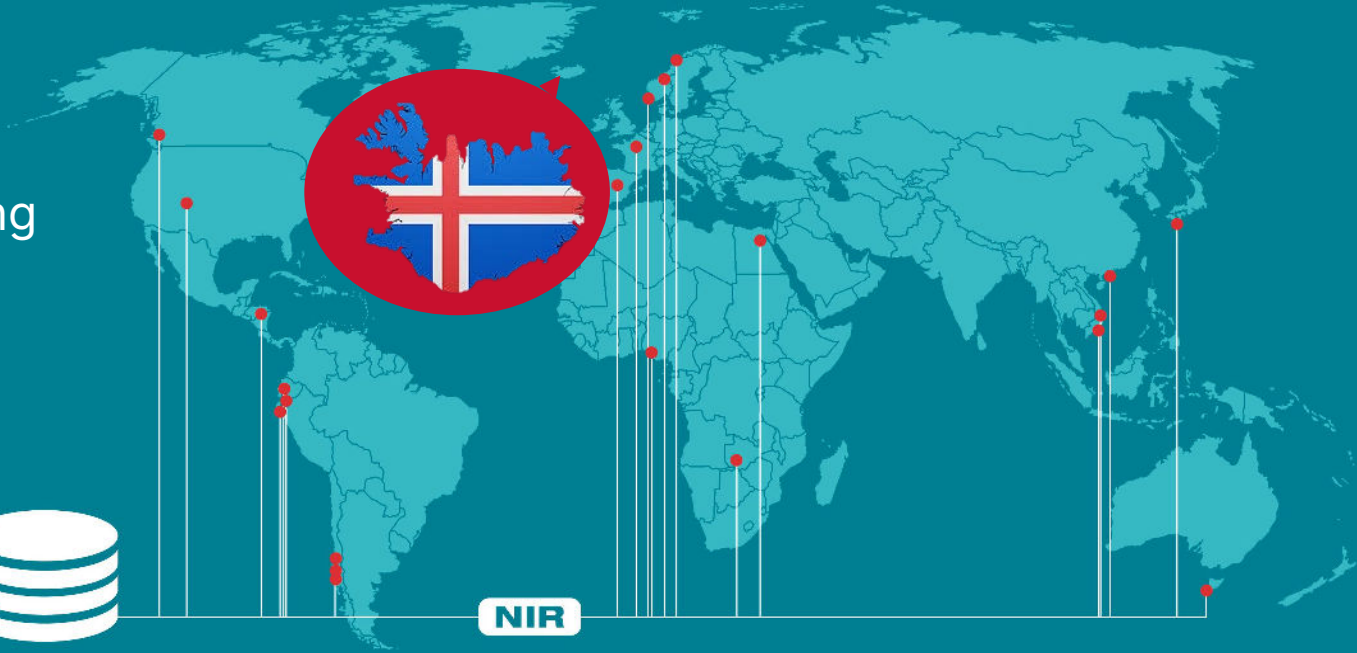
NIR parameters



Skretting NIR network

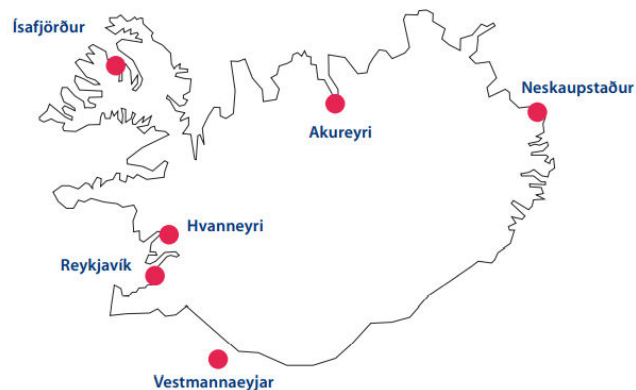
55 NIR instruments supported by Skretting AI

NIR INSTRUMENTS ARE CONNECTED TO THE SKRETTING DATABASE SERVERS



Matís

- A government owned, non-profit food & biotech research company
- The purpose of Matís: **support competitiveness and value creation in Icelandic food sectors, food safety and public health**
- 90 employees in six locations
- Multidisciplinary team of employees with very different expertise
- Strong analytical analysis infrastructure that provides valuable services to companies and government



Matís – Why this project?

- Matís provides wide range of services to government, institutions and companies that include chemical-, microbial-, biotech-, genetic- and sensory analysis.
- One of eight research groups at Matís is the research group of “sustainability and aquaculture” where the objective is to provide the Icelandic aquaculture industry services to grow and prosper.
- This collaboration with Skretting is one step in providing the Icelandic aquaculture industry the best service possible.

Fish quality report (example)



**Skretting FQ -
Salmon**



**Skretting FQ -
Salmon**

LIMS		Information from Customer					Skretting ARC results				
Sample ID	Cage ID - Fish ID	Weight whole	Weight slaughter	Slaughter loss	Length whole	Cond. Factor	Salmo Fat thawed	Asta NIR	Fat NIR	Estimated Total Pigment	
#	kg	kg	%	cm		g	mg/kg	g/100g	mg/kg	l	
E21132671	0008-L1	3.66	3.21	12.3	68.0	1.16	27.3	5.7	16.1	6.2	
E21132672	0008-L2	1.95	1.70	12.8	54.0	1.24	27.8	6.2	12.7	6.7	
E21132673	0008-L3	1.82	1.59	12.6	54.0	1.16	27.7	4.9	15.2	5.4	
E21132674	0008-L4	1.90	1.67	12.1	55.0	1.14	27.5	5.1	13.9	5.6	
E21132675	0008-L5	2.54	2.19	13.8	59.0	1.24	28.0	5.7	16.5	6.2	
E21132676	0008-L6	2.51	2.19	12.7	60.0	1.16	27.6	4.8	15.2	5.3	
E21132677	0008-L7	3.47	3.01	13.3	65.0	1.26	29.0	6.8	18.1	7.3	
E21132678	0008-L8	2.51	2.21	12.0	59.0	1.22	28.2	5.8	14.7	6.3	
E21132679	0008-L9	3.15	2.76	12.4	63.0	1.26	27.5	5.6	17.2	6.1	
E21132680	0008-L10	2.71	2.39	11.8	60.0	1.25	29.0	6.5	16.2	6.9	
Average		2.63	2.3	12.58	59.7	1.21	27.97	5.7	15.78	6.2	
Stdev		0.62	0.54	0.58	4.43	0.05	0.59	0.62	1.22	0.62	

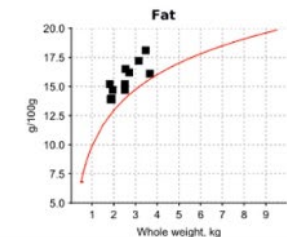
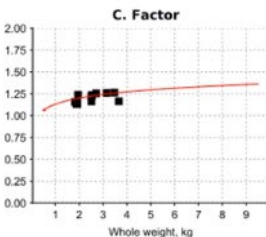
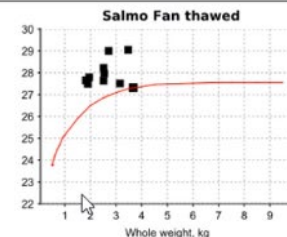
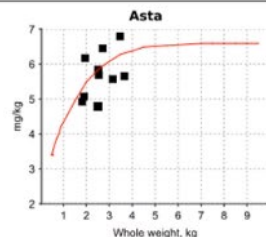
Remark:
1) Not accredited result

Yours Sincerely,
Olga Nikishaeva
Skretting ARC

Report can only be reproduced in its entirety with laboratory approval. Results apply only for received samples, in given condition upon arrival. Information given by customer may affect validity of results.

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ISO17025: NA Test 198

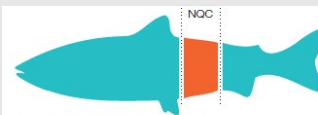


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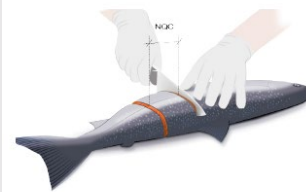
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Figur 1: Norwegian Quality Cut – NOC



Figur 2: NOC-stykket skjæres ut ved to vinkelrette kutt på sidelinjen, det ene like bak ryggfinneren og det andre ved gatåpningen



Figur 3: Merking og pakking av NOC.

Skretting fish quality program

Benchmarking

- Feed, farming, smolt, diseases, environmental factors

Building knowledge of quality development / batch

- decision support
- building of trend lines
- input to research

Documentation

- For sale / target correct marked

Cost optimization

- Optimize pigment strategy



Fish quality program @ Iceland – coming soon

Collaborate with
Matís on Fish
quality– use of **NIR**



Optimize pigment
recommendation and
documentation of fish
status



Data sharing





FISH
Quality