



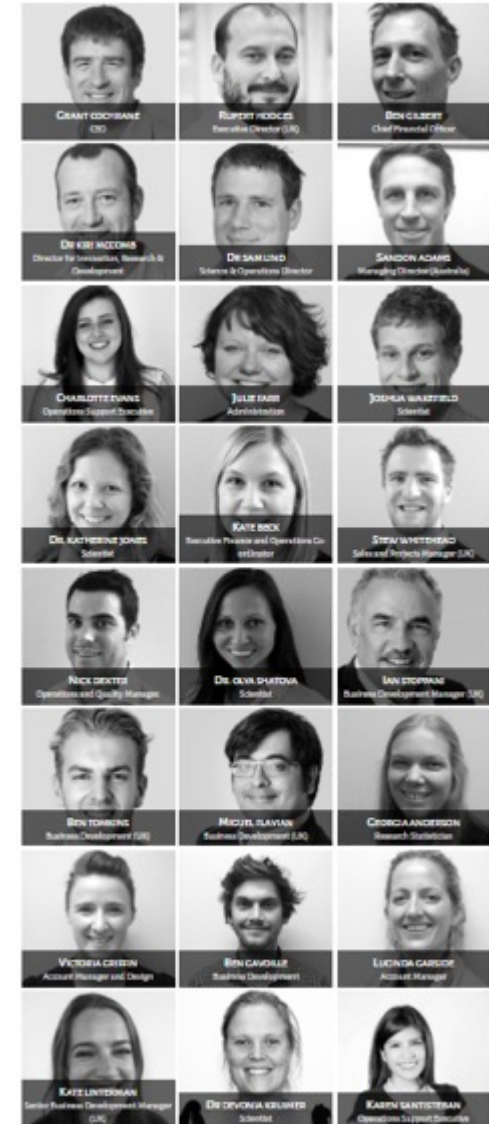
Scientific Traceability – Proving the origin of seafood

Olya Shatova, PhD
Seafood and Fisheries Emerging Technologies 14 February 2019



Who is Oritain Global?

- A privately owned company with offices in New Zealand, UK and Australia
- We use chemistry and statistics to prove the origin of food/fibre/pharma, to identify fraud and secure our customers supply chains



The issue

Food Fraud: What You're Eating Often Isn't What the Menu or Label Says



(Copyright DPC)

Report says 20% of seafood is mislabeled

Oceana says what you think you're buying may be another fish entirely

Seafood Fraud: The Turning Tides of an Industry Epidemic

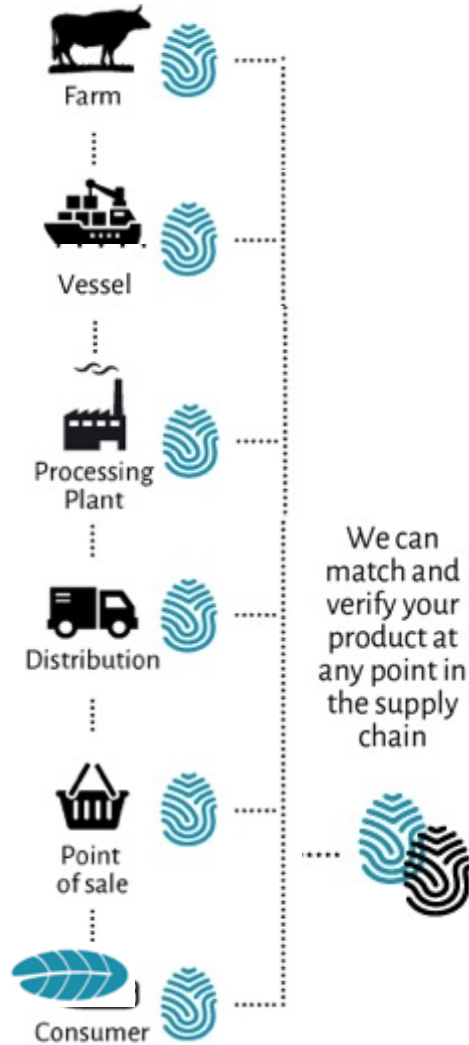
Food fraud: 10 counterfeit products we commonly consume

Coffee, olive oil and fish are just some of the foods regularly passed off as something they're not.

The Fish on Your Dish May Not Be the Salmon You Sought

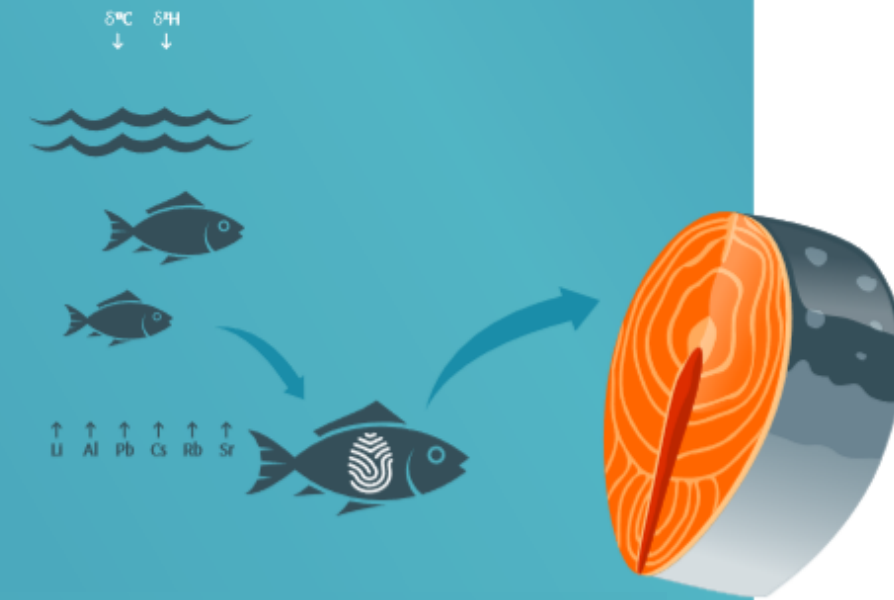
Launch of UK "Food Crime Confidential" Whistleblower Facility Is Reminder to Food Businesses to Ensure Integrity of Supply Chains

Illuminating the Supply Chain



We can match and verify your product at any point in the supply chain

ORITAIN TRACEABILITY & TRADITIONAL TRACEABILITY



Oritain tracks origin using intrinsic properties of the product (what's inside). The origin fingerprint of a product cannot be replicated. Oritain can test a product at any point in the supply chain to ensure transparency.

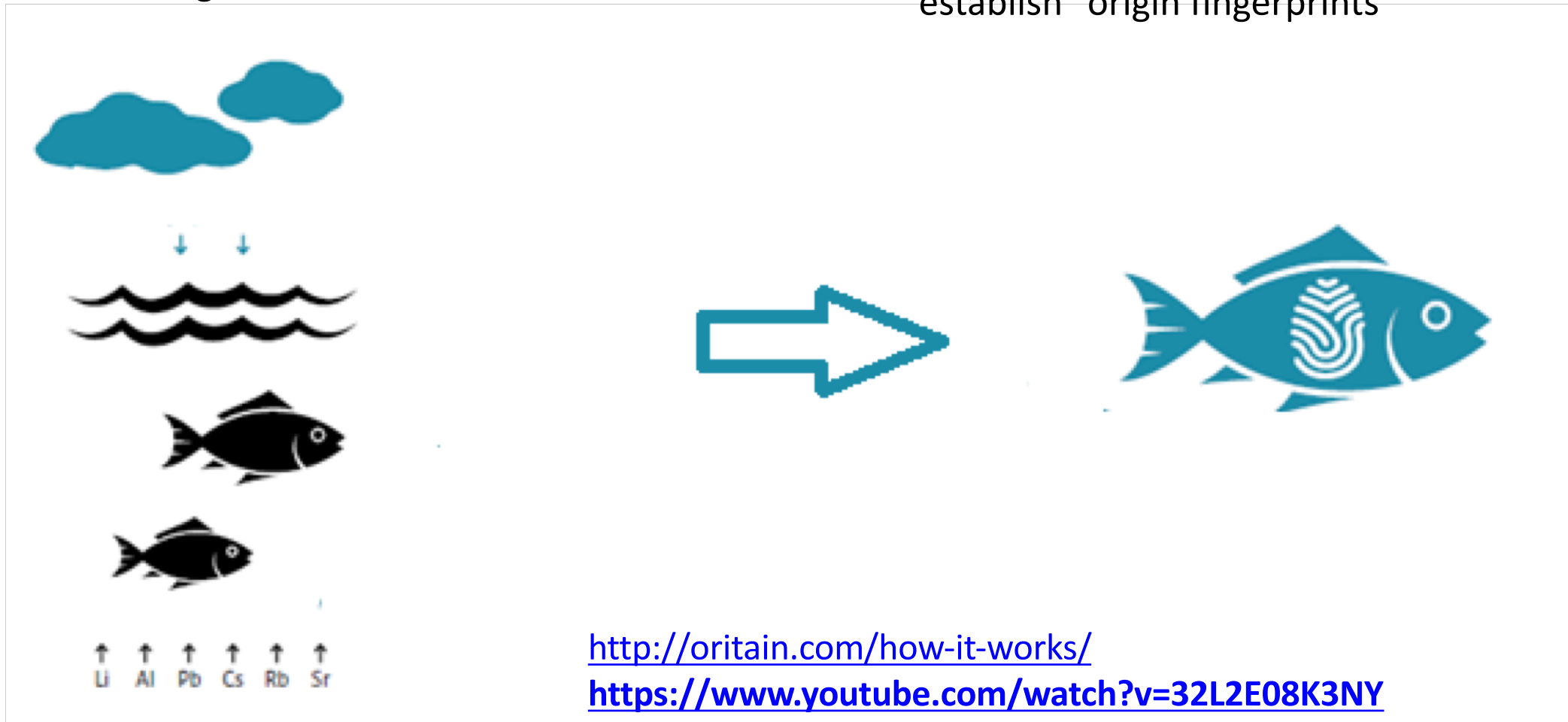


Traditional traceability systems measure the journey of a product, from origin to consumption via packaging or labels. The accuracy of information is only as good as what's claimed on the label or packaging. Once it is removed or counterfeited traceability is lost.

Origin Fingerprinting

The makeup of a product varies between different origins

Oritain identifies the differences to establish “origin fingerprints”



Let's take a step back: why “fingerprinting”?

A fingerprint is a collection of characteristics that can be put together to form a unique pattern

More points of difference
– larger number of possible patterns.



What markers do we use to create a fingerprint?

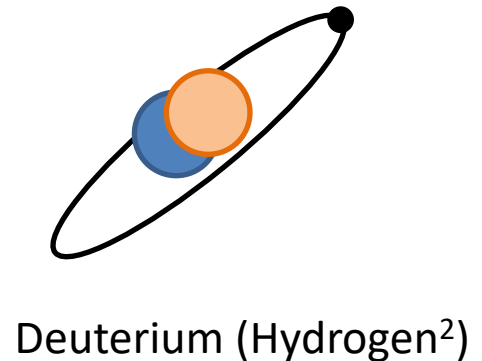
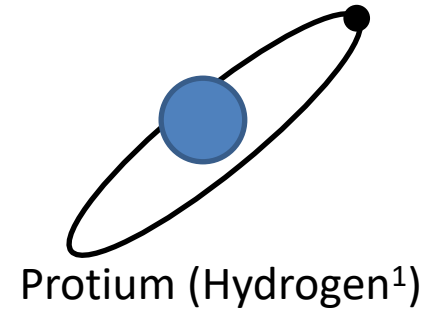
Measurement of **Chemical Markers – Trace Elements (TE's) and Isotopes ratios**

Trace Element

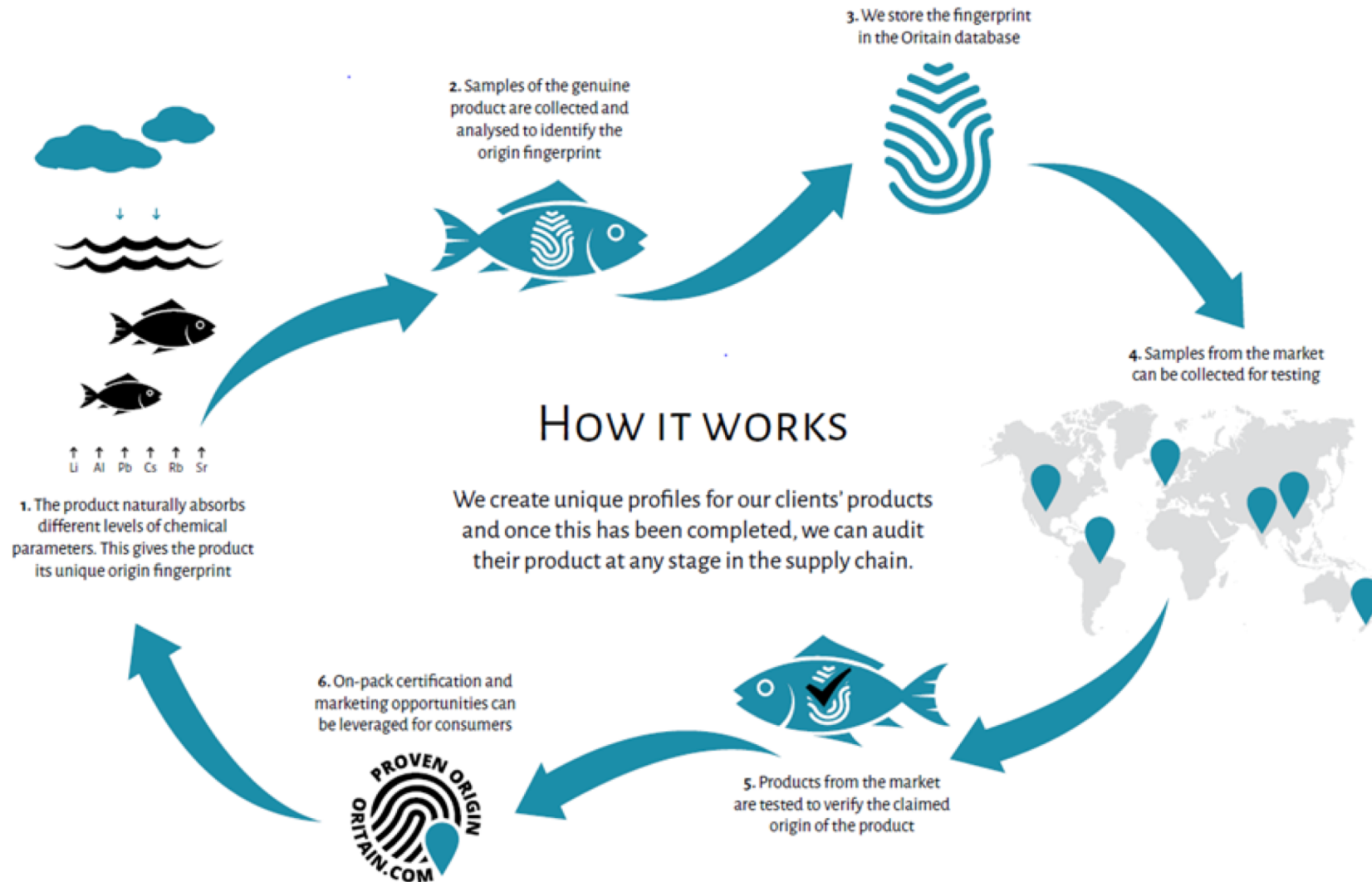
(in analytical chemistry) is one whose average concentration of less than 100 ppm

Isotope are atoms with the same number of protons but that have a different number of neutrons

Both are effected by processes in the environment



Oritain's process



Results of the trace element and isotope analysis



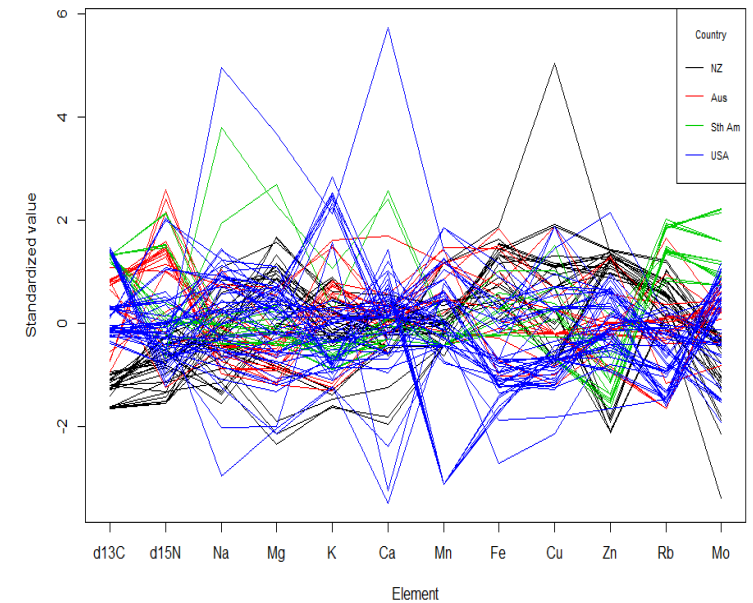
Sample preparation



Mass Spectrometry

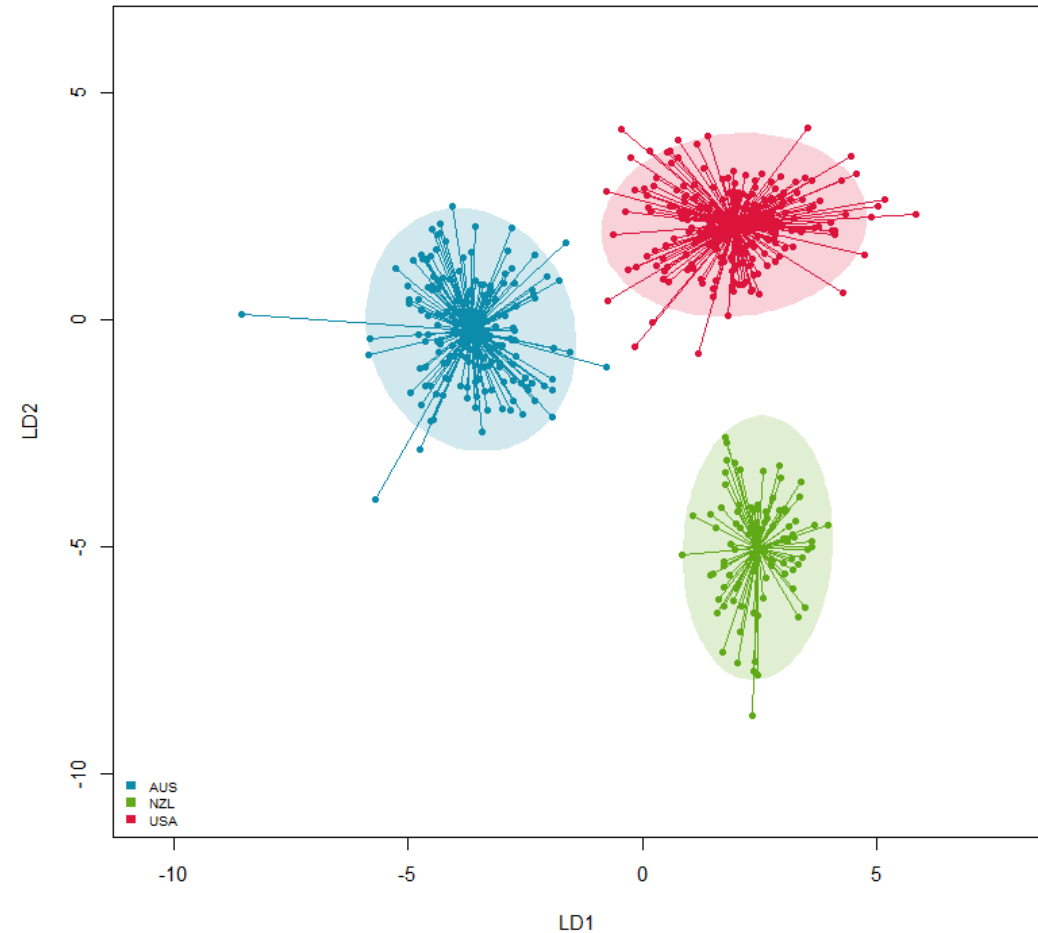
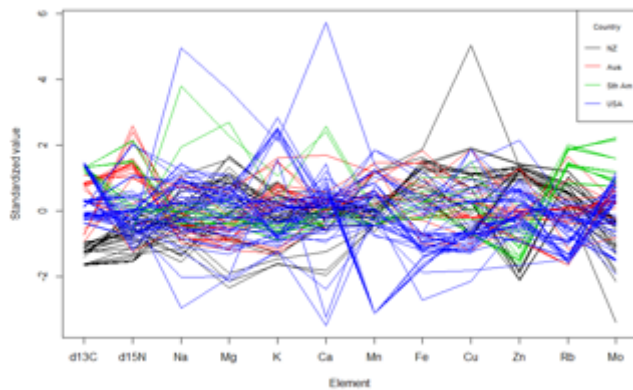


Output-concentrations and ratios of element and isotopes (chemical markers)



Using chemical markers to make an Origin Fingerprint

We use statistical modelling to calculate the relationship between the measured variables for each origins



Origin Verification



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Invermay Agricultural Centre
Private Bag 50034
Mosgiel 9053
New Zealand

Tel: +64 3 489 0086
Email: info@oritain.com
Web: www.oritain.com

ORIGIN VERIFICATION REPORT

Client Business Name:

Address:

Date Samples Received:

Sample Type:

Collected by:

Claimed Origin:

Submitted by:

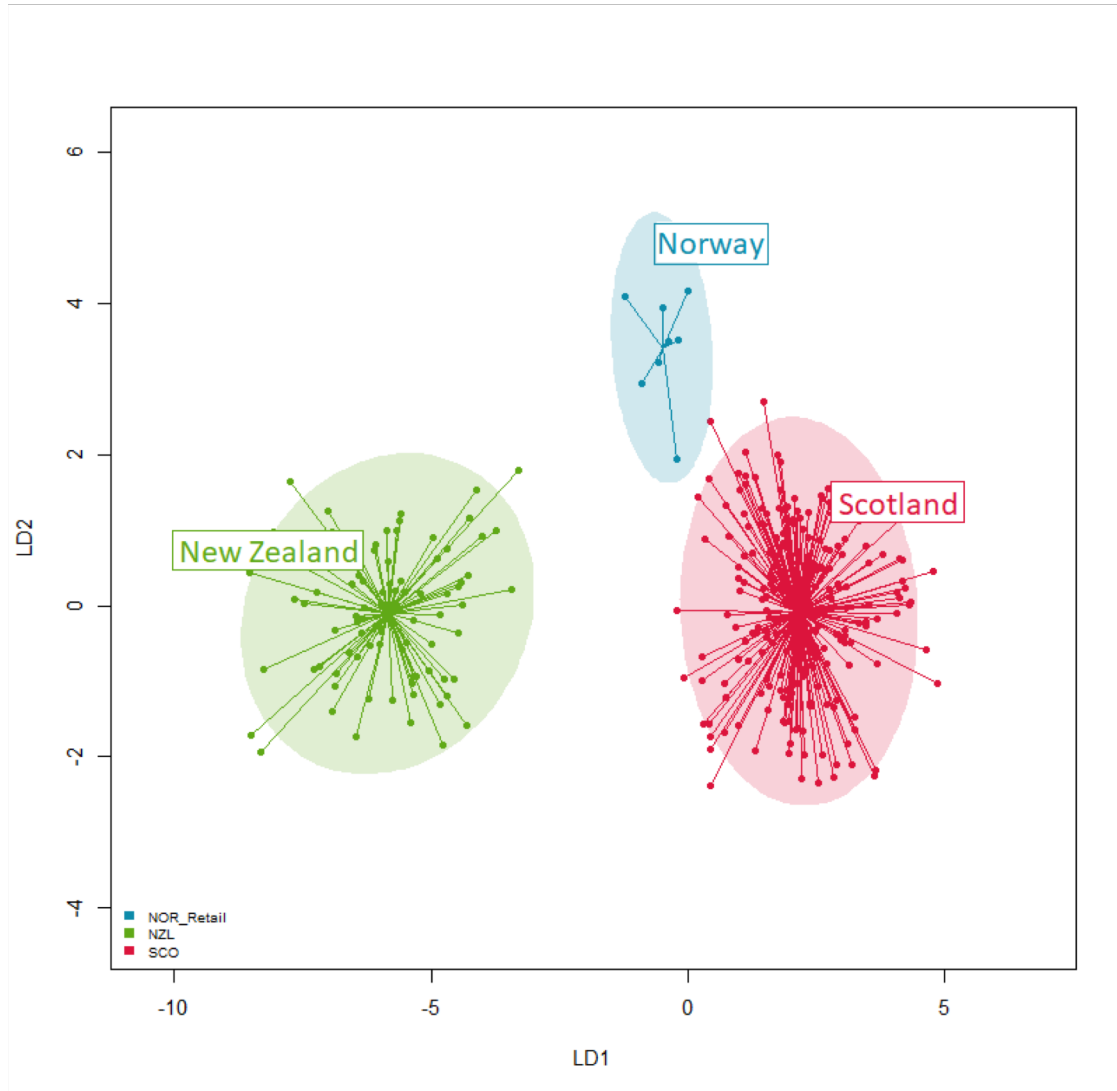
Sample	Photo	Specification	Specification Result*	
1		Origin: [claimed origin]	[Consistent/Inconsistent]	
...				

Case Studies: Seafood

Current projects with aquaculture products:

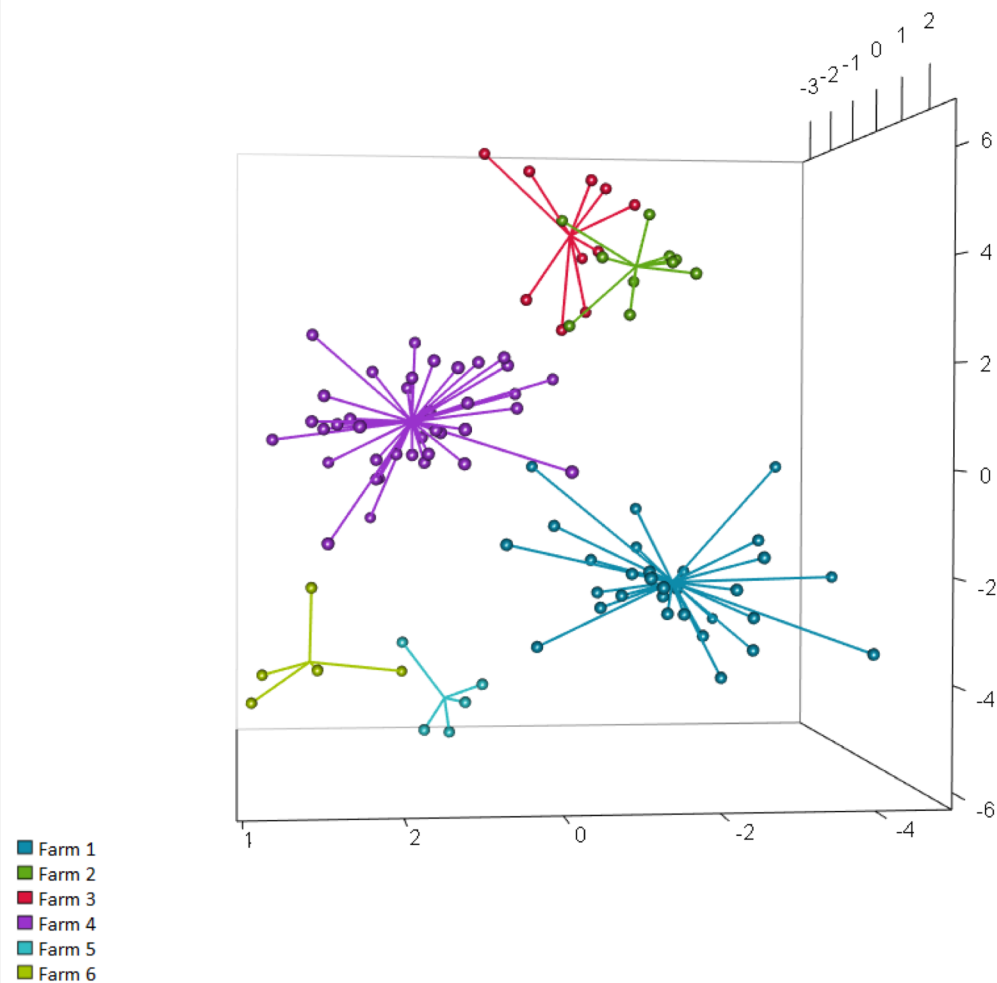
- Salmon
- Mussels
- Prawns
- Pangasius

Salmon. International



- 'Fingerprint' different to other countries
- 99% of genuine samples correctly identified
- Testing can identify if misrepresentation has occurred

Salmon. Scotland



Salmon. New Zealand



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PROVENANCE MATTERS

Sanford has partnered with Oritain to develop a robust solution to verify the origin of its Big Glory Bay ocean-farmed fresh King Salmon and Greenshell™ Mussels.

Our scientific traceability tracks a specific product back to the source rather than relying on packaging or barcodes. We have created an 'Origin Fingerprint' for Big Glory Bay King Salmon and Greenshell™ Mussels that exists due to the intrinsic chemical properties in the environment that the seafood is grown in.

With this information, Sanford can test any of these products from its farms in Big Glory Bay, Stewart Island, through to the plates of its customers to verify where they come from.

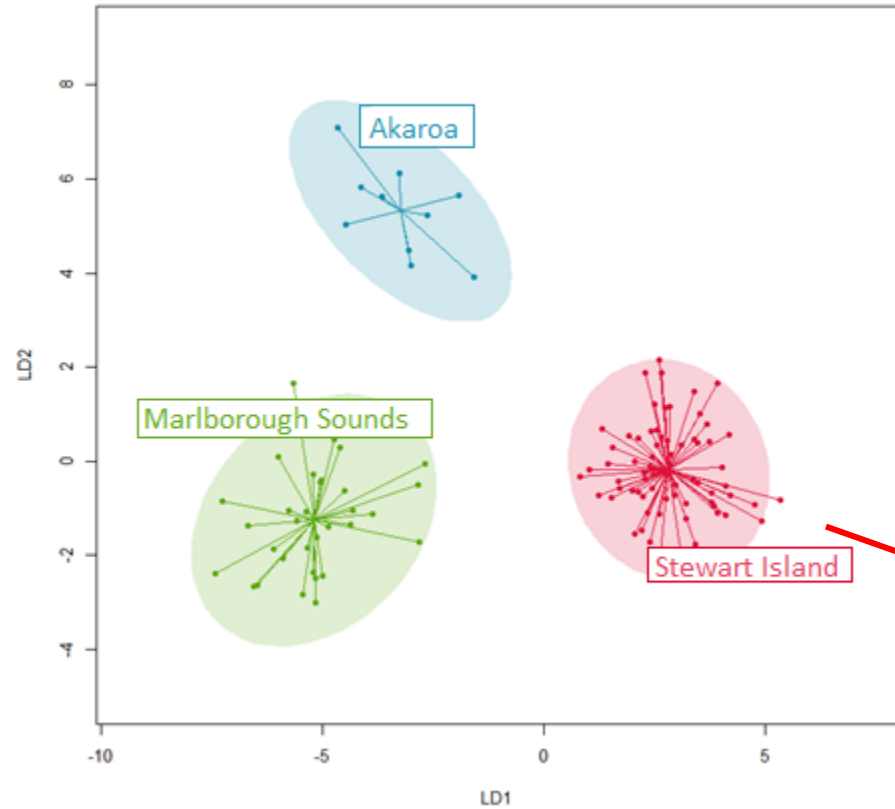
With consumers increasingly demanding origin information from suppliers, Sanford has taken a great step to ensure its customers are fully aware of the origin of their Big Glory Bay products, adding assurance and transparency.

For further information regarding Oritain's Scientific Traceability, [click here](#)



- Provenance brand
- Oritain as an independent endorsement of origin

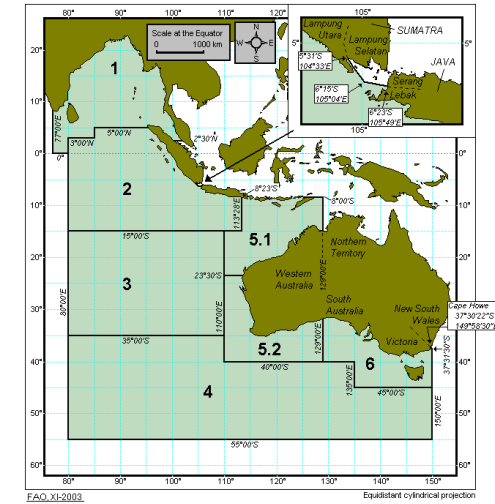
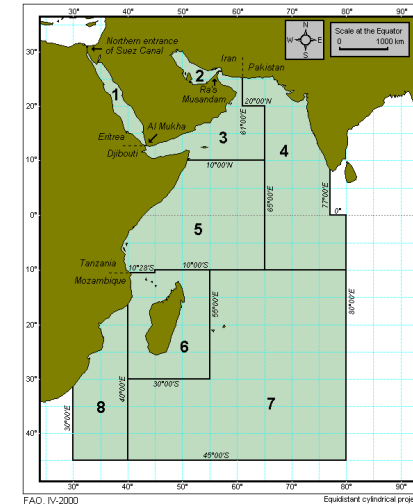
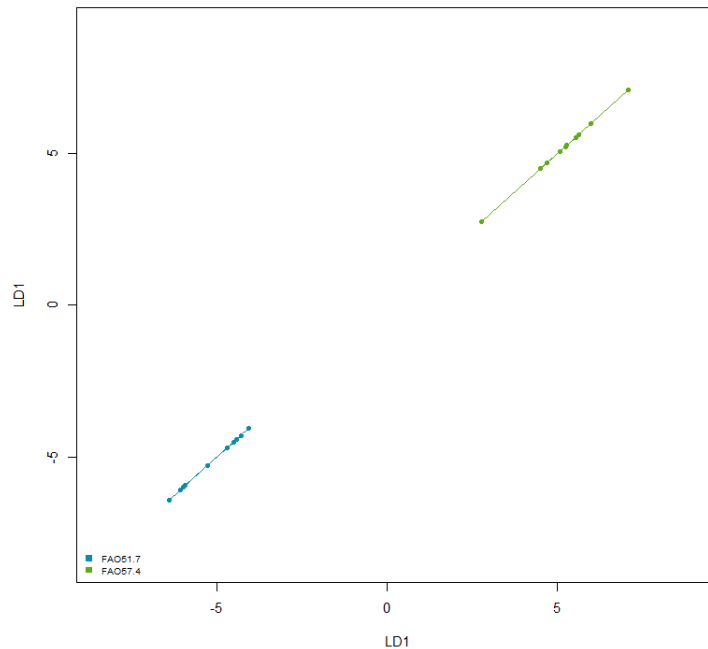
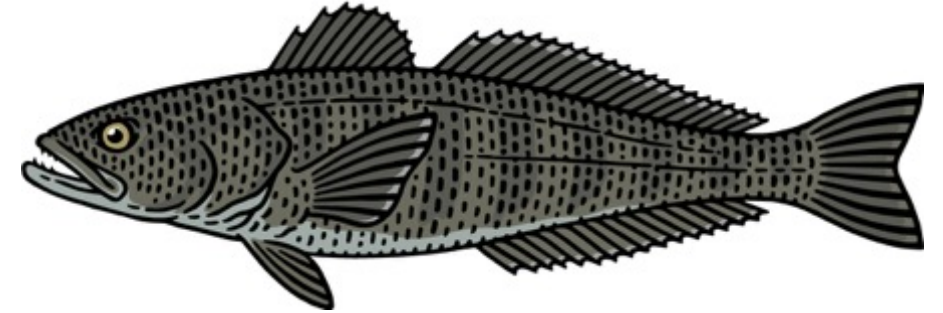
Greenshell Mussels. New Zealand



What about wild-caught?

Patagonian Toothfish pilot

- Fish samples from two FAO fishing areas



Potential for the industry

- Aquaculture: Traceability to the country, region or farm without packaging
- Commercial use for fisheries - to be explored



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Other applications

Pharma



ThermoFisher
SCIENTIFIC



Food



Fibre

