

Species Analysis of Fish and Seafood

DNA sequencing distinguishes all common fish, seafood and exotic species

Our Eurofins DNA competence centre in Ebersberg offers the gold standard for fish and seafood species testing: The highly acknowledged and ISO 17025 accredited method allows the identification of the species without initial knowledge of the species present. Additionally, specific real-time PCR approaches are available for the detection of commonly used fish species also in mixtures.



Flexible & Fast: Our Fish and Seafood Testing

With the universal DNA sequencing method as well as specific real-time PCR approaches we identify the species of fresh and frozen fish and seafood as well as fish eggs and caviar, fish products, such as fish on pizza, canned fish or ready meals. Our approach enables us to distinguish all common fish and seafood species as well as exotic fishes; e.g., in 2014 we detected more than 60 different fish species over all tested samples.

All commonly consumed fishes and seafood species can be detected, e.g.

- Salmon
- Perch
- Plaice
- Hake
- Haddock
- Cod
- Tuna fishes
- Sole
- Flat fishes
- Tusk
- Herring
- Whiting
- Pollock
- Sturgeon
- Tilapia
- Prawns
- Shrimps
- Mussels
- Lobsters
- ...and many more

How DNA Barcoding Works

DNA is isolated from the sample. At least two regions of the mitochondrial genome are analysed and compared with all known sequence data of the various species in the NCBI or BOLD databases. These databases are by far the most important and extensive, up-to-date sequence databases of the world containing mtDNA sequences of thousands of organisms. By comparing the sequence of the sample with the entries in the databases the species in the sample can be identified. The detection of several species in a mixed sample is limited to two major species which must be present at a level of >10%. Some very closely related species may be not distinguishable.

How DNA Metabarcoding Works

The detection of several species in a mixed sample is possible. DNA is isolated from the sample. At least three regions of the mitochondrial genome are analysed by Next

Generation Sequencing (NGS) and compared with all known sequence data of the various species in the NCBI or BOLD databases. By comparing the sequence of the sample with the entries in the databases each species in the mixture can be individually identified. Some very closely related species (e.g. *Thunnus* species) may be not distinguishable.

How Specific Real-time PCR Works

DNA is isolated from the sample. Mitochondrial DNA regions were real-time PCR amplified from sample DNA extracts with specific primers detecting up to eleven different fish: The real-time PCR has a limit of detection of 0.5% weight proportion for all eleven fish species. Using specific primer pairs, the analysis of complex mixtures is possible.

Advantages

- Universal approach detects and distinguishes between all commonly consumed fish / seafood species.
- Specific approach allows the identification of up to eleven fish species also in mixtures
- No prior knowledge about the expected species necessary.
- Very fast turnaround times available: results within 3 working days / standard TAT 7 days.
- Gold standard method of qualitative species analysis is used.
- Highly experienced lab accredited for species analysis for many years.
- Special test for discrimination of closely related species available.
- Special test for canned tuna - testing chunks and flakes separately – available.
- Large capacities with hundreds of samples per day.

Eurofins Quality

- Competence Centres with latest state-of-the-art technology.
- Local contacts with global network.
- Providing accurate results on time.
- Accreditation according to DIN EN ISO/IEC 17025:2005 or analogous local standards.
- Quality assurance by permanent participation in inter-laboratory ring trials.
- Officially authorised experts for control tests acc. to § 43 LFGB.

Our offer for fish speciation testing by DNA sequencing

Test description	Test codes	Turnaround times
Fesh/frozen or canned Fish and Fish Eggs, NOT for Tuna	BJ014	Standard TAT 7 days Rush TAT 3 days
Fresh/frozen and canned tuna (also on pizza, in salad etc.)	BJ019	Standard TAT 7 days Rush TAT 3 days
Crustacean (e.g. prawn, shrimp, lobster)	BJ020	Standard TAT 7 days Rush TAT 3 days
Squid/Octopus	BJ120	Standard TAT 7 days Rush TAT 3 days
Mussels	BJ220	Standard TAT 7 days Rush TAT 3 days
Special/exotic Fish (e.g. shark)	BJ320	Standard TAT 7 days Rush TAT 3 days
9 Fish Species Test (Norway and Atlantic Pollock, Atlantic Salmon, Pink Salmon, Shark Catfish, Rainbow Trout, Haddock, Pacific Cod, Atlantic Cod and Saithe)	BJ0F9	Standard TAT 7 days Rush TAT 3 days
11 Fish Species Test (Norway and Atlantic Pollock, Atlantic Salmon, Coho Salmon, Sockeye Salmon, Pink Salmon, Shark Catfish, Rainbow Trout, Haddock, Pacific Cod, Atlantic Cod and Saithe)	BJF11	Standard TAT 7 days Rush TAT 3 days
Processed products with mixtures of fesh/frozen or canned Fish and Fish Eggs, (works also for land vertebrates) NOT for Tuna, Crustacean, Mussels and Squid/Octopus	BJNGA	On request, available in 2015