



Research activities

The laboratory undertakes research to produce essential knowledge in order to:

- identify, quantify and characterise food-borne hazards;
- monitor them (prevalence, exposure);
- describe and model their behaviour for better quality and hygiene control in food production and preparation;
- understand their mechanisms of action (virulence, toxicity, bioavailability).

Some projects are financed by European (EU-FP, EFSA) and national (ANR, ARCIR, CPER, FUI, DIM, ministries, FranceAgriMer) calls for proposals.

The laboratory is a host structure for the doctoral schools of Paris-Est University and Lille-Nord-de-France University Research and Higher Education Centres (PRESs). It is a partner of the ARMADA joint technological units and the 'Use-By Date' joint technological network.

Main partners

National partnerships

French Technical Coordination for the Food Industry (ACTIA), French Atomic Energy Commission (CEA), university hospital centres, technical centres for food processing, French National Centre for Scientific Research (CNRS), Île-de-France Regional Council, Nord-Pas-de-Calais Regional Council, Departmental Directorates for the Protection of Populations, agricultural schools (AgroParisTech), veterinary schools, trade federations, French Research Institute for the Exploitation of the Sea (IFREMER), French National Institute for Agricultural Research (INRA), Institut Pasteur in Paris and Lille, French Institute for Public Health Surveillance (InVS), National Research Institute for Environmental and Agricultural Sciences and Technologies (ISTREA), National Laboratory for Metrology and Testing (LNE), French Ministry of Agriculture, Food and Forestry (Directorate General for Food), French Ministry of Social Affairs and Health (Directorate General for Health), Museum of Natural History, competitiveness cluster (Aquimer), universities (Paris-Est, Paris-Sud, Lille Nord de France, etc.).

International partnerships

European Commission (DG Sanco), European Food Safety Authority (EFSA), Joint Research Centre (Geel, Belgium and Ispra, Italy), the Central Public Health Institute (ISS - Italy), Centres for Disease Control and Prevention (CDC, ECDC), the Veterinary Laboratories Agency (VLA - UK), HPA (UK), the Federal Institute for Risk Assessment (BfR - Germany), the Finnish Food Safety Agency (EVIRA - Finland), the National Institute for Public Health and the Environment (RIVM - Netherlands), the National Veterinary Institute (SVA - Sweden), the Technical University of Denmark (DTU - Denmark), PHA, Agriculture and Health Canada (Canada), Kingston University (Canada), University of Oviedo (Spain), International Organization for Standardization (ISO - Switzerland), European Committee for Standardization (CEN - Belgium), National Institute of Standards and Technology (NIST - USA), etc.

Accreditation

This laboratory has been accredited by the French Accreditation Committee (COFRAC) in accordance with the NF EN ISO/CEI 17025 standard under numbers 1-2246 (Maisons-Alfort) and 1-2248 (Boulogne-sur-Mer) for testing. The scope of the accreditation is explained on COFRAC's website.

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Laboratory for Food Safety

The laboratory, with sites in Maisons-Alfort (MA) and Boulogne-sur-Mer (BsM), focuses on the biological and chemical hazards that can affect food safety and quality.

In its area of expertise, it is involved in fulfilling ANSES's reference, research, monitoring, epidemiological and scientific and technical expert appraisal missions.

The Maisons-Alfort site hosts 140 professionals specialising in food safety and the Boulogne-sur-Mer site has 20 staff members who contribute to the quality and hygiene of fishery products.



Objectives

The Laboratory for Food Safety provides support to public decision-makers through general scientific expertise on the quality and safety of foodstuffs, and more specific scientific expertise on certain processing sectors. Its work is focused on biological (bacteria, viruses, parasites) and chemical (toxins, metals, pesticides, organic pollutants, histamine) hazards found and likely to be found in foods, particularly during distribution and consumption:

- it develops knowledge on the identification of hazards found in foods;
- it develops methods for detecting, characterising and quantifying them;
- it analyses their causes and development factors;
- it helps monitor them, particularly to report the emergence or re-emergence of certain organisms and compounds;
- it helps standardise and draft regulations for specific methods and criteria governing these hazards;
- it helps assess the related risks, particularly by performing quantitative risk assessments and providing data on the prevalence of a biological hazard or the occurrence of a chemical hazard;
- it examines how practices and processes influence the expression of food hazards and specifically focuses on the effectiveness of control measures undertaken throughout a food's lifetime (*from farm to fork*) and quality indicators related to hygiene.

The laboratory also performs analyses for health authorities and professionals in relation to fishery products (fish, shellfish, crustaceans) in Boulogne-sur-Mer and in relation to all foodstuffs in the framework of the Central Laboratory for Veterinary Services.

It is home to the 'Identypath' national technological platform for high-throughput pathogen identification and typing.



The main biological contaminants studied by the laboratory

Salmonella, verotoxin-producing *E. coli* (VTEC), coagulase-positive staphylococci, *Listeria monocytogenes*, *Cronobacter sakazakii*, *Bacillus cereus*, *Vibrio*, *Clostridium botulinum* and *perfringens*, enteric viruses (HAV, HEV, noroviruses, enteroviruses), *Anisakidae*, hygiene markers in fishery products and dairy products and other Enterobacteriaceae.

The main chemical contaminants studied by the laboratory

Organic pollutants (furan, acrylamide, brominated flame retardants, etc.), pesticides (organochlorines, organophosphates, pyrethroids, carbamates, etc.), trace metals (arsenic, lead, mercury, cadmium, metal nanomaterials, etc.) and minerals (sodium, potassium, calcium, magnesium, etc.), bacterial toxins (*Staphylococcus aureus* and *Bacillus cereus* toxins), marine biotoxins (lipophilic toxins, domoic acid, saxitoxins, pinnatoxins, ciguatoxins, etc.), mycotoxins (aflatoxins, ochratoxins, etc.), cyanotoxins (microcystins, etc.), biogenic amines (histamine, cadaverine, putrescine, etc.).

11 units, one mission and one technological platform

- Bacterial ecophysiology and detection (MA)
- Modelling of bacterial behaviour (MA)
- Hygiene control (MA)
- Bacterial epidemiology and characterisation (MA)
- Microbiology of fishery products (BsM)
- Organic pollutants and pesticides (MA)
- Toxin characterisation (MA)
- Mineral and inorganic environmental contaminants (MA)
- Physico-chemistry of fishery products (BsM)
- Central Laboratory for Veterinary Services (MA and BsM)
- Virology of food and water (MA)
- Parasitology of fishery products (BsM)
- Platform for high-throughput pathogen identification and typing (MA)

Reference activity

As a reference laboratory, it provides health authorities with scientific and technical expertise (sample analyses, surveillance plan, validation of analytical methods, Inter-Laboratory Proficiency Tests, training of accredited and recognised laboratories and monitoring the quality of their analyses, study coordination, etc.) and participates in exchanges with international scientific partners.

European Union Reference Laboratory (EURL)

- Milk and dairy product hygiene
- Coagulase-positive staphylococci and staphylococcal enterotoxins
- *Listeria monocytogenes*

National Reference Laboratory (NRL)

- Coagulase-positive staphylococci/staphylococcal enterotoxins
- *Listeria monocytogenes*
- *Vibrio* sp. In fishery products
- Milk and dairy product hygiene
- Marine biotoxins
- Pesticides in foodstuffs of animal origin and products with high fat content
- Pesticides using mono-residue methods
- Heavy metals in foodstuffs of animal origin
- Mycotoxins in foodstuffs of animal origin
- Histamine
- Anisakidae (in collaboration with the Maisons-Alfort Laboratory for Animal Health)
- Antimicrobial resistance (in collaboration with the ANSES Fougères, Ploufragan-Plouzané and Lyon laboratories)
- *Salmonella* sp. (in collaboration with the ANSES Ploufragan-Plouzané laboratory)
- Avian botulism (in collaboration with the ANSES Ploufragan-Plouzané laboratory)

