A reference laboratory for antimicrobial resistance

In collaboration with the laboratories in Lyon, Maisons-Alfort and Ploufragan, the Fougères Laboratory acts as National Reference Laboratory for antimicrobial resistance. Its responsibilities, undertaken in accordance with Directive 2003/99/EC on zoonoses, include:

• measuring the antimicrobial susceptibility of sentinel bacteria (E. coli and Enterococcus spp.) in strains sampled as part of national surveillance programmes implemented by the Directorate General for Food (DGAL). These tests are carried out by COFRAC-accredited laboratories;
• to study emerging resistance mechanisms and confirm them in these bacterial species;
• to analyse resistance trends based on changes in veterinary and breeding practices;
• to contribute to risk assessments on the transfer of resistance to humans.

Biocides

The Fougères Laboratory provides scientific and technical expertise by:

• participating in national (AFNOR), European (CEN TC 216) and international (OECD) standardisation efforts for methods intended to assess the bactericidal, fungicidal and virucidal action of antimicrobial biocides;
• contributing to the expert appraisal of biocide dossiers both at the national and European levels on behalf of the Ministry of Ecology.

Partners

• European Commission / General Directorate for Health & Consumers (DG SANCO) / Directorate General for Enlargement
• Ministries of Agriculture, Fishery and Ecology
• Brittany Regional Council
• European University of Brittany (UEB)
• University of Rennes (Vie-Agro-Santé Doctoral College)
• Biogenouest
• Scientific interest group (GIS) on cyanotoxins, Network of national reference laboratories for veterinary drug residues
• Network of Departemental Analysis Laboratories for veterinary drug residues
• Network of Interprofessional Dairy Laboratories
• Network of National Reference Laboratories for antimicrobial resistance
• INRA Joint Research Unit / National Veterinary School (ENV) of Toulouse
• Network of Laboratories within the European Committee for Standardisation (CEN) and the Organisation for Economic Co-operation and Development (OECD)
• Joint Programme of the Food and Agriculture Organisation / International Atomic Energy Agency (FAO/IAEA)
• Association of Official Analytical Chemists (AOAC) – International
• AOAC – European division
• AFNOR (French Standards Agency)
• French Health Products Safety Agency
• Technical centres (Adria Normandie and Quimper, etc.)
• French pork institute (IFIP)
• Inaporc
• French Society of Detergents, Cleaning and Industrial Hygiene Product Industries (AFISE)
• Federation of hygiene product manufacturers

The Fougères Laboratory is involved in improving knowledge of the benefits and risks of veterinary medicinal products and disinfectants used by the food processing industry and in evaluating the toxicity of residues and contaminants.
Mission

The 70 staff members of the Fougères Laboratory work in the area of food safety on veterinary drug residues and on the toxicity of food contaminants, while in veterinary medicine and food hygiene, areas of interest include the antimicrobial efficacy of antibiotics and disinfectants, as well as the development of resistance to these agents.

The Laboratory’s work focuses on:

- screening for residues of veterinary medicinal products in foodstuffs of animal origin;
- the anti-microbial effectiveness of antibiotics and disinfectants;
- resistance to these products;
- evaluation of the toxicity of contaminants.

It carries out research on the analysis of veterinary drug residues, on the characterisation of antimicrobial effects (antimicrobials and biocides), and on the characterisation of toxicological hazards related to contaminants. The laboratory also develops new tools for the prediction of toxicity.

Main research programmes

- Design and validation of methods for confirming veterinary drug residues by mass spectrometry.
- Non-targeted screening of veterinary drug residues in foodstuffs of animal origin.
- Pharmacokinetics of antimicrobials use in animals.
- Evaluation of the risk of resistance selection.
- Evaluation of rinsing operations on the elimination of disinfectants applied to food-contact surfaces.
- Evaluation of peroxides used alone or in combination on the destruction of target foodborne viruses.
- Evaluation of the risk of transfer of antibiotic resistance genes in human intestinal microbiota.
- Assessment of antibiotic and disinfectant resistance in Campylobacter sp, Listeria monocytogenes, Escherichia coli and Enterococcus faecium.
- Evaluation of the prevalence of colistin resistance in Escherichia coli isolated in pig slaughterhouses.
- Validation of new hepatocyte cell models.
- Impact of mycotoxins on human intestinal microbiota: the specific case of deoxynivalenol (DON).
- Evaluation of the genotoxicity of the mycotoxin deoxynivalenol (DON), a Fusarium toxin.
- Development of a methodology for determining the genotoxic potential of nanoparticles.
- New in vitro approaches for the study of the toxic effects of lipophilic phycotoxins, alone or in combination, likely to emerge as a result of climate change.

Research units and departments

- Antibiotics, Biocides, Residues and Resistance.
- Analysis of Residues and Contaminants.
- Toxicology of Contaminants.

Reference activities

The Fougères Laboratory conducts its reference activities in the areas of antimicrobial resistance and veterinary drug residues and dyes in foodstuffs of animal origin and animal feed.

A veterinary drug residue reference laboratory

As European Union Reference Laboratory (EURL) for antimicrobial and dyes, and National Reference Laboratory (NRL) for veterinary drug residues, the Fougères Laboratory contributes to veterinary control through its expertise in analytical activities. It improves analytical methods by:

- conducting and coordinating research on analytical methods;
- developing, optimising and validating methods for the detection of veterinary drug residues in foodstuffs of animal origin.

It contributes to the quality of the analyses carried out by the accredited laboratories for residue control by:

- assistance with setting up quality assurance systems;
- organising inter-laboratory proficiency tests;
- training of scientific and technical personnel;
- distribution of scientific and technical information;
- scientific and technical support;
- confirmation analyses.

It provides scientific and technical expertise to the authorities through providing:

- information;
- assistance with implementing monitoring and inspection plans.

Monitoring veterinary drug residues

The chemical substances contained in medicinal products administered to animals may remain in foods in trace amounts.

In Europe, these residues are regulated (Regulation EC 470/2009) and controlled (Council Directive 96/23/EC):

- their rate of elimination in tissue and animal products must be studied by the pharmaceutical industry;
- they must not exceed the Maximal Residue Limit recognised as safe for human health;
- there must be a minimum timeframe between the last administration of a drug and the moment at which animals and their products are made available for consumption (withdrawal period);
- the agrofood industry checks for the presence of residues in food, and the authorities check that the maximum residue limits and withdrawal period have been complied with through analyses and surveys.

Accreditation

This laboratory has been accredited by COFRAC in accordance with the NF EN ISO/CEI 17025 Standard, under the reference number 1-2247 (Tests), and in accordance with the NF EN ISO/CEI 17043 Standard, under the reference number 1-2294 (Inter-laboratory comparison - CIL). The scope of accreditation is explained on the COFRAC website. (http://www.cofrac.fr).