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ANSES 2025 Work Programme

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Investigate, evaluate, protect

Contents

Regulated Products Division

The division's main task is **scientific assessment** and **decision making (at national level)** for products and active substances (ASs) in the following thematic areas:

- **Plant protection products (PPPs)**;
- **Biocides**[1];
- **Fertilisers and growing media**;
- **Veterinary medicinal products (VMPs)**.

Assessments cover the **risks to human or animal health and the environment**, but also the **effectiveness**, selectivity or expected **benefit** of a product, depending on its use.

The division's scientific teams also make **various other contributions to ANSES's in-house expertise** in broader fields (animal health and biocides, ecotoxicity issues, etc.). Units of the Regulated Products Division are involved in **preparing dossiers under the REACH**[2] **and CLP**[3] **Regulations.** Other cross-cutting tasks, such as expert appraisal for setting maximum **residue** limits (active substances of VMPs and PPPs), are also vital ongoing activities. Lastly, the teams are very active in improving assessment methodologies for both internal and external work, most of it at European level.

The 2025 work programme of the Regulated Products Division will be structured around the following framework elements:

- **Continue improving efficiency**, by looking for ways to optimise assessment and decision-making processes to help achieve appropriate examination times for applicant dossiers, particularly regarding plant protection products; this goes hand in hand with maintaining efficiency when the indicators are already highly satisfactory (as is the case with veterinary medicinal products);
- **Carry out work on formal requests according to the timetable defined in the associated contract**, particularly in the event of alerts or emergencies reported by the bodies issuing the requests, while striking a balance with the division's core activity – work on application dossiers – and considering the resources available in the division.

[1] Including swimming pool water treatment products and embalming products in the transitional period of Regulation (EU) No 528/2012. For these two themes, see the 2022 document on transfer of missions to ANSES.

[2] REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) is a European regulation (Regulation (EC) No 1907/2006) that came into force in 2007 to secure the manufacture and use of chemicals in European industry.

[3] Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (known as the CLP Regulation).

- **Continue digitising internal and external procedures** and update (or consolidate) the information systems, in a context of urbanisation of the Agency's information systems and in keeping with the European tools used by the European Chemicals Agency (ECHA), European Medicines Agency (EMA) and European Food Safety Authority (EFSA);

- Respond to the priorities and challenges facing society, in line with **major government plans and national, European or international issues:**
    - Support **the National Biocontrol Strategy**;
    - Provide input for the debate on the **Ecophyto 2030 plan by contributing to this plan's Scientific and Technical Committee**, which was due to be re-established in 2024 in partnership with the National Research Institute for Agriculture, Food and Environment (INRAE) and the French Biodiversity Agency (OFB);
    - Be a stakeholder in **EcoAntibio** through the contribution of the ANMV[4] to monitoring the Third EcoAntibio plan, or its participation in the interministerial committee for health as part of the roadmap for controlling bacterial resistance to antibiotics;
    - Contribute to the **Pollinator Plan**;
    - Contribute to the **National Endocrine Disruptor Strategy (SNPE)**: ANSES will continue assessing the endocrine-disrupting nature of chemicals as part of the follow-up to the SNPE2. For biocidal and plant protection active substances, ANSES will assess dossiers or contribute to their assessment: this will systematically include the assessment of substances' endocrine-disrupting properties;
    - Update methodologies in the context of the European Commission's Chemicals Strategy for Sustainability, which is the European deliberation on "One substance, one assessment" issues;
    - Contribute to the Fourth National Environmental Health Action Plan (PNSE4) on issues relating to the proper use of biocidal products.

- Strengthen information sharing and maintain listening and dialogue, in particular by perpetuating the platform for dialogue on marketing authorisations (MAs) for PPPs (the chair of this body is expected to be renewed) and by coordinating the day of meetings with veterinary medicine stakeholders;

- Maintain activities and a presence at European and international level in the bodies and priority work of the European Commission, EMA, EFSA, ECHA, UN Food and Agriculture Organization (FAO), World Health Organization (WHO), World Organisation for Animal Health (WOAH, formerly OIE), European and Mediterranean Organisation for Plant Protection (EPPO), Codex Alimentarius joint FAO/WHO programme, Organisation for Economic Co-operation and Development (OECD), etc.

In addition, for PPPs, as it has done through its monitoring of the Solutions Committee – a consultative body placed under the ministerial aegis to identify PPP treatment solutions in "deadlock" situations (i.e. where there is a lack of solutions and alternatives) – ANSES will

[4] French Agency for Veterinary Medicinal Products, within the Regulated Products Division.

continue to document progress on dossiers and will aim to optimise the processing of new MA applications reported in this context. The Agency will also continue to **justify and explain all its actions and decisions**, as it did to the Committee on the renewal of agricultural standards (CORENA) and then to the aforementioned **Solutions Committee**. **Joint work with the supervisory ministries will therefore be pursued to ensure that ANSES shares relevant information for guiding the actions of the Solutions Committee** (which is expected to become permanent in a form that has not yet been determined). ANSES will also actively contribute to limiting situations where **decisions are not harmonised**, particularly when they result from European disparities in the use of **harmonised assessment methodologies**.

This programme is divided into five themes, described below.

1. Maintain an appropriate response for assessing products and active substances and authorising products within the Regulated Products Division's remit

An appropriate level of taxes and budget path

The division's speciality and main challenge remain its work to assess the risks and effectiveness/benefits of various products on the basis of applications from companies holding or applying for MAs or similar authorisations[5].

This activity is mainly financed by **tax revenues or fees**, which depend on the volume and nature of applications submitted. A major issue is therefore ensuring an appropriate level of taxes and tax rates, in view of the costs borne by the Agency. After revising the rates for VMPs, the division will continue to work with the Legal Affairs Department on the rates for biocidal product fees and PPP taxes, and to examine its business model **with a view to stabilising the rates over several years and adjusting them to the workload and inflation, while ensuring that the biocontrol strategy is not held back**.

Adjustments to the information systems

Modernisation and digitisation through information systems (ISs) are contributing to overall efficiency. To this end, in the area of biocides, the **SIMMBAD platform** was replaced in early 2023. A **specific IS for managing the examination of biocide applications**, which complements the European R4BP online reporting system, is being finalised and will become operational in early 2025. This involves a sustained effort by the teams of the core departments (DAMM and

[5] Parallel trade permits; authorisations by mutual recognition, etc.

DEPR[6]) and the IS department of the Regulated Products Division, which has an impact on some of their other work. The **D-Phy** project is operational with the digitisation of application forms for plant protection products, and has been upgraded to include a tool for managing the submission of complete application dossiers. The European **PPPAMS**[7] project will be closely monitored to align potential European obligations on PPPs with existing in-house tools, in order to improve cooperation and efficiency, and avoid redundancy of tasks and tools. Lastly, software applications relating to veterinary medicinal products now exchange data with the European databases developed by EMA under the new Regulation (EU) No 2019/6, since its entry into force on 28 January 2022, with the creation of the Union Product Database (UPD). It is a **major achievement to have implemented these flows in good time before the Regulation's entry into force, given the particularly large volumes of exchanges for France**. **These applications have also been supplemented by other developments** (data on manufacturers/wholesalers, management of online sales reporting, etc.).

Prioritisation of dossiers and better control of processing times

Dossier assessment and decision-making activities (concerning both active substances and products) continue to vary in volume depending on European activities (renewals of AS approval or assessments of new ASs) and MA renewals, as well as the submission of other applications including new MAs, parallel trade permits (PTPs) and experimentation permits, etc. For 2025, the following points should be noted:

- **Keep the trajectory for biocontrol products on track: this priority, which has already been largely achieved**, has resulted in improved timeliness and therefore fewer dossiers currently being examined, reduced processing times (shorter than the European legal requirement) and around a hundred applications processed per year since 2017;
- **Backlog reduction trajectories maintained for PPP dossiers, and processing times for all regulated products maintained as far as possible;**
- **Prioritisation of dossiers for biocidal active substances that have not yet been approved**, to help speed up the procedure for examining existing substances with a view to meeting the new deadlines set by the European Commission. To this end, the teams are expected to be strengthened under an agreement signed between ANSES and the European Commission on funding until 2028.

[6] Respectively, the Market Authorisations Department and Regulated Products Assessment Department within the Regulated Products Division.

[7] Plant Protection Products Application Management System
https://food.ec.europa.eu/plants/pesticides/authorisation-plant-protection-products/pppams_en

Milestones in the 2025 expert appraisal trajectory

This section focuses on methodological aspects related to changes in the assessment framework, which are particularly important for tailored assessments.

- **Methodological developments and scientific cooperation: in this respect, it is worth noting the strong dimension of the work on methodological developments in the field of plant inputs and biocides, with a full agenda including more than 50 internal and external collaborative projects. Given their European collaborative nature, these projects are described in Section 5 of this summary.**

Particularly noteworthy is the cooperation with EFSA in cumulative risk assessments (CRAs) of dietary exposure to pesticides, under the "EFSA-SANTE Action Plan on CRA for pesticides residues" programme (in which eight to 15 organ systems require a CRA), and in methodologies for assessing non-dietary exposure to PPPs. Lastly, there is ANSES's involvement in the European Partnership for the Assessment of Risks from Chemicals (PARC) co-financed by Horizon Europe. These initiatives are seeking to improve the understanding of chemical risk assessment methodologies.

- For veterinary medicinal products, the priorities identified for 2025 are as follows:

  Strengthen the links between the ANMV and ANSM:

  - by continuing the work begun on innovative therapies and organising several seminars to exchange practices on environmental assessment and the use of real-world data in the area of medicines and pharmacoepidemiology;

  Regarding phytotherapy (considering the volume of other activities):

  - apply the methodology for setting maximum residue limits (MRLs) for herbal products, based on the examples of oregano, liquorice and turmeric essential oils, and lead the regulatory and scientific work packages of the European COST project MEDPLANT4VET, in order to extend the scope of the work carried out and define the French position, so as to implement the VMP Regulation's Article 157 regarding herbal veterinary medicines;

  Regarding antiparasitics:

  - monitor the results of the Fipronil study and ensure they are communicated at European level;
  - take part in monitoring the AMPARA project and act on the recommendations of the formal request on antiparasitics applied in dips, showers and sprays that relate directly to the ANMV's work.

  With regard to temporary authorisations for use:

  - capitalise on the successful experiences of the last two years to optimise procedures.

- Support the measures in the veterinary medicinal product industry's "decarbonisation roadmap" in conjunction with the ANMV's activities.

Milestones in the decision-making process

It should also be noted that, as a decision maker, ANSES has to perform essential tasks that are unrelated to expert appraisal, **such as informing regulated product users of decisions (MAs, PTPs, experimentation permits), or clarifying regulations** that have an impact on applications or the form of the decisions. In this respect, the following should be mentioned:

- Management of the consequences of the new provisions on **bee protection**; buffer zones to protect **local residents** from CMR2 products, with processing of dossiers being finalised in 2024;
- Decisions made available by maintaining and updating the **E-Phy website** (responses to requests, publication of news, especially on product withdrawals, improving database reliability);
- Better public availability of data (open data), with more complete files and weekly updates;
- In 2024, the DAMM also analysed the findings of the expert appraisal on **plant protection products containing the active substance copper**. This process will conclude with decisions being made at the end of the year, in a complex context that will take account of the comparative assessment already conducted and any substitution options, with a socio-economic perspective provided by the Social Sciences, Economics & Society Department (DiSSES);
- Information on amendments to adapt national laws and regulations on veterinary medicinal products to European regulations.

2. Secure the authorisation system through post-MA monitoring and the response to emerging issues

Vigilance schemes: phytopharmaco-, veterinary pharmaco- and toxicovigilance

Using the results of studies promoted and financed under the phytopharmacovigilance scheme (PPV, Science for Expertise Division), or signals collected from other vigilance schemes, as well as its interactions with *Santé Publique France*, the OFB and other partners, ANSES will pay **close attention to various health signals related to uses of regulated products**, detected mainly through clinical cases and epidemiological studies (cohorts, case-controls, etc.), and biological (biomarkers) or environmental monitoring studies.

The **PestiRiv study** is continuing, with sampling having been carried out correctly in 2023.

Following on from the GEOCAP-AGRI project, ANSES was keen to develop knowledge of the links between occurrence of paediatric cancers and pesticide exposure in agricultural areas. It will therefore fund a team from Inserm to carry out **the GEOCAP-PEST study**, which will seek to **characterise exposure** to pesticides from the use of plant protection products in crop-growing areas.

ANSES's work will also focus on **improving knowledge in the following areas, by supporting various studies** conducted through phytopharmacovigilance activities. Signal processing (similar to the work performed in 2022, for example, on prosulfocarb) will continue, with signals being **classified as alerts** where necessary. **Potential measures can be taken on MAs if warranted due to the risk**, like the amendments for S-metolachlor in 2022, for instance.

In the field of veterinary medicinal products, the above-mentioned new regulation laid down the implementation of a **new approach to veterinary pharmacovigilance**, through the establishment of **signal detection**: the ANMV in particular has positioned itself as a driving force for proposals through its continued participation in the European pilot working group on signal detection (P-SMEG), but also more broadly through its contribution to European signal detection and the implementation in France of regulatory or communication actions decided on at European level.

For all active substances, other work conducted outside the Regulated Products Division under the **toxicovigilance** scheme, with the support of the working group on "Toxicovigilance for regulated products", will also enable **data on poisoning cases associated with regulated products** to be analysed and taken into account when issuing, amending or withdrawing marketing authorisations.

Monitoring committees and post-MA actions

The work of the MA monitoring committee was suspended for several months due to the resignation of several of its members, which was purely due to external circumstances. Following a positive call for additional applications, six new members were appointed in July 2024 for the remainder of the current term. Work therefore restarted in September 2024 on **adaptation, feasibility and compliance with risk management measures in the MAs for PPPs and biocides**. For PPPs, the MA monitoring committee has already been asked to address issues such as prosulfocarb and copper. For VMPs, **the mandate of the members of the corresponding monitoring committee (CSMV) was renewed for a further three years on 1 October 2024, with few new candidates, underlining the difficulty of identifying and attracting new skills for this group**. Nevertheless, the previous term of office was very productive, with numerous debates, in particular on solutions for treating feline infectious peritonitis (FIP), antimicrobials, a review of good practice guidelines on the use of antibiotics, and numerous publications on subjects of interest in veterinary medicine, such as antibiotics produced by biosynthesis, anticipating the effects of drug combinations, use of live vaccines in veterinary medicine, and the strengths and limitations of local antibiotic therapy. For its next term, the committee plans to work in particular on monoclonal antibodies.

Inspections

In the area of monitoring and control, ANSES will continue to regularly offer its PPP expertise to State control bodies.
It will also carry out **inspections of product formulation facilities** in line with its resources (two FTEs) and prerogatives (Article L. 250-2.5 of the French Rural and Maritime Fishing Code). This mission, which has suffered from problems due to staff shortages, needs to re-establish itself on a long-term basis and focus on planning and actually implementing inspections.

The **ANMV's inspection mission** will continue, while being mindful to the volume of non-priority inspections. In particular, this mission will include the following related work: integration of a **new inspection policy for facilities or activities now subject** to the requirements of Regulation (EU) No 2019/6 or the French Public Health Code, through a 2025 inspection programme based on risk analysis; continuation of the Europe-wide review of **good manufacturing practices** for veterinary medicinal products and autogenous vaccines; adoption of new guidelines for **good laboratory practices** and **good clinical practices**.

3. Maintain expert appraisal activities in response to formal requests

In addition to its main tasks examining authorisation applications or assessing active substances, the Regulated Products Division will work on responding to formal requests, with lead times adapted to both its own constraints and those of its supervisory authorities or other requesting bodies.

The division contributes to various projects led by other Agency entities whenever its expertise is useful and can be mobilised, such as in the following work:

- **Relevance of PPP active substance metabolites** in water intended for human consumption;

  The work of the Risk Assessment Department (DER) on **relevant metabolites** in water will continue according to the priorities of the Directorate General for Health, with a view to documenting reports of the presence of certain metabolites – such as those of S-metolachlor – in water analysed by the PPV scheme. In a similar vein, the division has lent its expertise to cross-cutting work led by other units (on TRVs, health reference values, blood contamination limit values), thus contributing to the response to various formal requests and the analysis of reports made to the PPV scheme;

- Request for an opinion on the development of a **calculation method to assess the overall criticality of health and environmental hazards associated with the use of household consumer products**, in order to improve the clarity of their labelling (scheduled for September 2024);

- Management measures in the event of botulism in wildlife (biocidal issues);

- Support for the **Vectors Mission with regard to vector control methods**;

- Formal request on the assessment of experiments carried out on **alternative vector control techniques (SIT, IIT)** and recommendations on risk management measures.

The main expert appraisals to be led by the division in 2025 are as follows:

- Request for scientific and technical support to the inspection authorities for determining a **limit value for *Legionella longbeachae* in fertilisers and growing media**;

- Internal request on the analysis of the results of an exploratory study to measure the presence of nanoparticles in plant protection products and biocidal products;

- Essential oils and plants of interest for **phytotherapy and aromatherapy in food-producing animals: the opinion issued in 2022 may if appropriate lead to further developments on MRLs in interaction with ANSES's working group on "Plants" (internal requests on oregano, turmeric and liquorice essential oils)**.

4. Strengthen information sharing and maintain listening and dialogue

Improving access to information on regulated products, whether for applicants or stakeholders, will continue to be a **priority** for the Agency.

In view of the extremely high societal expectations regarding regulated products, and PPPs in particular, the Agency will pursue its cross-cutting objective of **openness to society, in line with its undertaking in the renewed Charter on Dialogue and Openness to Society**, with regard to all its stakeholders. This will primarily be achieved by maintaining the **platform for dialogue on plant protection products**, set up in 2017, which will continue its exchanges twice a year with a new chair. This body facilitates discussions on the results of expert appraisals and the Agency's work, and enables better training and information to be provided for all stakeholders. In 2025, ANSES will conduct a survey of the platform members' expectations and draw up a report on its activities to date.

In terms of **transparency, the assessment conclusions and MA decisions for PPPs, fertilisers and growing media[8] are published** on the ANSES website. The regular publication of a **monthly MA newsletter** also helps improve access to information on these activities. ANSES will continue in this vein by regularly upgrading the E-Phy website to integrate user feedback, and continuing to make data available as open data.

5. Maintain and develop the Regulated Products Division's activity and presence at European and international levels

The Agency will remain at the forefront of European and international issues.

Cooperation in assessments

This concerns application dossiers processed at European level (**European MAs for biocides and VMPs, or zonal MAs**, depending on the situation and the products concerned) or processed on behalf of European agencies in the framework of **reporting for ASs**[9] of biocides, VMPs and PPPs. ANSES will continue to hold a leading position in Europe among rapporteur Member States for **assessing active substances or setting MRLs for PPPs and VMPs**. With dossiers for which it is not the rapporteur Member State, it will play an active part in the **comment and peer-review phases**. The Agency shares the opinions it publishes with the other Member States.

[8] Reports and decisions regarding MAs for biocidal products are also published, but on the ECHA website.
[9] Active substances

Support for its supervisory ministries

ANSES **supports the competent authorities in preparing for regulatory and standardisation bodies or discussion groups and negotiations**, at European (SCoPAFF[10]) and international (CCPR[11]) levels for plant protection products; in the BPC[12], CG[13] and meetings of the competent authorities and the SCBP[14] for biocidal products; through participation in EPPO's[15] herbicide panel; and in EMA's standing committee on veterinary medicinal products (CVMP[16]) and expert group on veterinary medicinal products (CMDv[17]) for veterinary medicines. It will also provide support to the competent authorities in **setting standards for fertilisers**.
The ANMV will continue its **involvement in the implementation of the new European regulation** on veterinary medicinal products by providing scientific and technical support to its supervisory ministries with the negotiation of delegated and implementing acts for the new Regulation and the adaptation of French law.

Cooperation, in particular relating to changes in methodological frameworks

ANSES continues to be proactive in the field of **assessment methodologies** for all regulated products. **EFSA, EMA and ECHA are and must remain key partners** for all the Agency's work in the field of regulated products, particularly to ensure a collegial approach to expert appraisal, knowledge sharing and methodological harmonisation.

In order to better promote its scientific knowledge and publications, ANSES will remain closely involved in developments relating to methods for assessing the effectiveness and risks of products regulated **at European level**:

- Cumulative risk assessment for the Cumulative Assessment Group for PPP active substances (EFSA, project in collaboration with the RIVM (Netherlands) and BPI (Greece)).
- Draft opinions for EFSA on harmonised MRLs for PPP active substances that are not currently approved.
- Updating of EFSA's methodology for assessing non-dietary exposure to plant protection products (management of a consortium of institutes and universities).
- Development of methodologies for assessing dietary exposure – ECHA's ARTFood (Assessment of Residue Transfer to Food) Working Group.

[10] SCoPAFF: Standing Committee on Plants, Animals, Food and Feed. A regulatory committee chaired by the European Commission

[11] CCPR: Codex Committee on Pesticide Residues

[12] BPC: Biocidal Products Committee, under ECHA

[13] CG: Coordination Group for Biocidal Products, for which ECHA provides the secretariat

[14] SC: Standing Committee on Biocidal Products

[15] EPPO: European and Mediterranean Plant Protection Organisation

[16] CVMP: Committee for Veterinary Medicinal Products

[17] CMDv: Coordination Group for Mutual Recognition and Decentralised Procedures – Veterinary

- OECD's Residues Chemistry Expert Group (RCEG): Drafting of OECD guidance documents for setting MRLs in honey, for defining residues in plants and animals, and on the storage stability of treated samples.

- European Working Group on Antimicrobial resistance (ECHA, European partners).

- ANR's Young Researchers Programme. Biocides at home: emissions, potential exposure and reduction solutions (École des Ponts ParisTech/LEESU; INERIS; HSR University of Applied Sciences, Switzerland/UMTEC).

- Participation in the EFSA group on revision of the guidance document on risk assessment for birds and mammals (PPPs).

- Participation in the group on development of toxicokinetic/toxicodynamic (TK/TD) approaches and modelling in ecotoxicology for PPPs.

- Participation in the group on development of groundwater risk assessments based on spatial distribution modelling for PPPs.

- Participation in the development of environmental assessment methods for disinfection by-products (biocides).

This list is not exhaustive and there are also other national studies, as well as close cooperation on **assessing the effectiveness of PPPs**.

ANSES will pursue essential development work through its participation in the scientific work planned under the European PARC partnership.

In the field of veterinary medicinal products, ANSES will also maintain or develop a major presence in European bodies, mainly by strengthening its role through positions as chairs and vice-chairs of European groups (such as the **Chair of the CMDv**, for which it obtained a third mandate in 2023, or the CVMP's Antimicrobials Working Party, which is now chaired by an ANMV staff member) and by continuing its commitment to the network of **European Heads of Medicines Agencies (HMA)** and to EMA's management board.

In 2025, ANMV is also set to renew its mandate as a **WOAH collaborating centre** in the field of veterinary medicinal products. It will continue its deep commitment to **combating antimicrobial resistance**, in particular by setting up the WOAH database and training national focal points in different countries. The ANMV will be a driving force in all of **EMA's working groups**, as well as in monitoring antibiotic use at European level through contributions to the groups monitoring antimicrobial sales and use (ASU and ESUAVET) and the European Surveillance of Antimicrobial Consumption (ESVAC) report developed by EMA, and to actions on **resistance to antiparasitics**. It is also leading the VETFRAM project, funded by the European Commission over six years. This intends to use the Calypso application to organise declarations of antimicrobial use reported by the various animal production sectors at European level, in order to provide input for the new Antimicrobial Sales and Use (ASU) database.

Lastly, it will do its best to continue providing assistance with development and sharing French expertise through the various cooperation agreements, particularly with third countries.

Research & Reference Division

1. Introduction

The **Research and Reference Division** brings together the Agency's nine laboratories, along with the Strategy & Programmes Department (DSP), which is responsible for leading the definition of the laboratories' scientific strategy and contributing to its implementation through the coordination of cross-cutting activities.

The ANSES laboratories carry out **analytical reference missions** (66 national mandates, 13 European mandates and 28 international mandates were held by these laboratories in September 2024) and **research** activities. They **contribute to surveillance** in the areas of animal health and welfare, plant health and food safety, as well as in wastewater and sewage sludge since 2021. These laboratories also play a part in the Agency's **expert activities** in all these areas.

In line with ANSES's 2023–2027 scientific orientations for research and reference activities (www.anses.fr/fr/content/orientations-scientifiques), which are distributed to the laboratories in the form of 2023–2027 orientation letters, and with ANSES's Goals and Performance Contract (COP) also drawn up for 2023–2027, the **laboratories' work programme** is drafted and proposed in the form of detailed work sheets covering all their reference, research, monitoring and expert appraisal activities. These are then discussed with the supervisory ministries. They provide an overview of the trajectory adopted by the various units, and can be used by managers for guidance, planning and dialogue with the supervisory ministries. These sheets, which are now prepared once every two years, were therefore presented to the supervisory ministries in autumn 2024 for the period 2025–2026.

This section sets out the **main orientations and highlights of the 2025 work programme for the activities of ANSES's laboratories, broken down according to the Agency's six cross-cutting strategic themes** (animal health & welfare, plant health, food safety, antimicrobial resistance, epidemiology & surveillance, exposure to and toxicity of chemical contaminants), which largely determine these activities. These six themes, each promoted by a scientific director, help ensure coordination between the various entities, the efficient internal running of the Agency and the search for synergies, both between the laboratories' scientific units and with the risk assessment units, within their respective spheres of competence. These six themes also interact very closely with each other around major integrative issues (One Health approach, exposome, response to climate challenges, etc.).

This section first presents the cross-cutting projects led or coordinated by the DSP, followed by the laboratories' specific activities according to each of the six cross-functional strategic themes.

Note that these scientific orientations include numerous programmes funded under calls for research proposals won by the Agency's teams, particularly in forward-looking research and preparedness for health crises.

2. Cross-cutting projects led by the Strategy & Programmes Department

The DSP is responsible for guiding development of the scientific strategy of the Agency's laboratories for research, reference and surveillance. It is also tasked with contributing to the implementation of this strategy through the coordination and facilitation of cross-functional activities, with the support of the scientific directors. In particular, it initiates, supports and leads actions that contribute firstly to harmonising, promoting and disseminating methods, products, resources and data from the laboratories, and secondly to ensuring the performance and efficiency of schemes and compliance with ethical standards while the work is carried out.

In addition to leading the cross-cutting strategic themes, the DSP is involved in the Agency's global roadmaps on taking account of climate change, issues of data acquisition, management and exploitation, open science and participatory research.

Efficiency

The process led by the DSP to **harmonise and consolidate the reference activities of the Agency's laboratories, with a view to improving efficiency**, will be pursued in 2025. Thus, the in-house working group tasked with proposing guidelines and tools to bring about convergence in **diagnostic reagent verification practices** will finalise its work on pricing practices. In 2025, the in-house group set up in late 2022 will continue work on harmonising practices for **calculating and using measurement uncertainty**. A **meeting of all the ANSES reference laboratories** will again be organised in the coming year to maintain momentum in the internal exchange of practices and experience between laboratories responsible for reference activities at national (NRL) and European (EURL/EURC) levels, along with a **seminar for inter-laboratory proficiency test (ILPT) coordinators**, to continue to facilitate sharing and the search for common solutions to work in this area.

In the field of **biosafety**, the internal committee for the control of biological risks in laboratories, led by the DSP, will continue inter-laboratory coordination efforts in order to promote exchanges of experience, harmonisation of practices and development of shared tools to benefit all the laboratories. For 2025, this will involve pursuing work on the conditions governing the cessation and resumption of activity in confined spaces. The DSP will also continue work undertaken with a view to making proposals to decision makers on specific changes to the regulations on **micro-organisms and toxins (MOTs)** and the adjustments that are essential for their implementation, in order to minimise the difficulties and constraints currently encountered when analysing environmental samples and, more generally, during reference and surveillance activities. In this respect, recent emerging and re-emerging health

threats (mpox, polio, etc.) have acutely illustrated the fact that our ability to respond promptly and effectively with work on these pathogens is still very much dependent on the provisions of the MOT regulatory framework.

Lastly, the DSP will continue to run ANSES's in-house **technological and methodological platforms**, enabling the pooling of equipment and skills to serve the nine laboratories – in 2025, this will include dedicated support for the proteomics and metabolomics platform (Prométhée) set up at the Fougères laboratory in 2024 – and of the future high-resolution chemistry platform to be set up in Maisons-Alfort in 2025.

Major sector-specific projects

The year 2024 has again see our teams mobilised to implement the action plan following the **collective audit of ANSES's research and reference activity**, which took place in 2022, based on the recommendations made by ANSES's Scientific Board at the end of this audit. In particular, the following actions should be emphasised, in line with the objectives set in ANSES's new **Goals and Performance Contract (COP) for 2023–2027**:

- work to consolidate our policy on **biological assets**: building on the recent roll-out in all our laboratories of a common information system for computerised management of the biological collections, the aim for 2025 will be to formalise our strategy to capitalise on these assets outside the Agency;
- discussions and work aimed at structuring the policy and implementation procedures for **managing and exploiting laboratory data**: within the more general framework of the cross-cutting DATA project launched at ANSES in autumn 2024 under the guidance of the recently recruited Chief Data Officer, the DSP will propose actions directly serving the laboratories' activities and assist with their implementation. In 2025, for example, an inter-laboratory activity will identify needs and propose a joint strategy to ensure that the IT infrastructure can keep abreast of the rapid changes taking place in laboratory activities consuming large amounts of IT resources (genomics, high-resolution chemistry, epidemiology, etc.).

Scientific coordination for each of the six cross-cutting strategic themes (animal health & welfare, plant health, food safety, antimicrobial resistance, epidemiology & surveillance, exposure to and toxicity of chemical contaminants) promoted by the six scientific directors will continue in 2025. This is intended to strengthen coordination and the search for synergies, both between the laboratories' scientific units and with the risk assessment units, by using incentives identified for each theme (seminars, funding of doctoral students under co-supervision, etc.). Based on the recommendations of the collective audit and discussions with the new ANSES Scientific Board set up in 2023, inter-theme coordination will be proposed to strengthen integrative coordination. In particular, greater emphasis will be placed in 2025 on integrating issues related to **climate change** and its health impacts into the Agency's scientific orientations and activities, as well as on sharing and on breaking down inter-sectoral barriers around **resistance** issues (antimicrobial resistance, resistance to biocides, resistance to antiparasitics, resistance to plant protection products).

In order to facilitate this, the DSP will maintain its mechanisms for **allocating specific budgetary**

funding to teams for projects addressing major strategic challenges. The two-year projects selected in the call for expressions of interest issued in late 2023 by the DSP will continue in 2025. The aim is for this funding to make it easier to set up exploratory projects in line with the strategic research and reference priorities, particularly by breaking down barriers and fostering closer scientific ties between the different ANSES teams, as well as in terms of collaborative strength with key external partners with whom the Agency has signed framework agreements, or with regard to its response to questions from risk assessors, to the potential for industrial application, to the mobilisation of participatory research, etc.

In 2025, the DSP will once again administer a new **call for projects for doctoral grants** to encourage the hosting and supervision of doctoral students and maintain the circulation of new ideas within the teams. This will be a joint effort with INRAE, CIRAD, VetAgro Sup, the CEA, Oniris and Ifremer.

Lastly, in 2025, the DSP will once more organise **ANSES's Scientific and Doctoral Days** (JSDA) dedicated to the work of all the Agency's scientists. As well as promoting the scientific excellence of the Agency's entities – especially its laboratories – on topics of importance to ANSES, the objective is to foster synergies and information exchanges between the Agency's scientists on its research, reference, surveillance, risk assessment and regulated products activities, while marking an important step in the training of the doctoral students hosted at the Agency.

Changes to address the challenges

Work will continue in 2025 to organise the **deployment of new technological approaches in the laboratories**, in particular the use of whole genome sequencing (WGS) or high-resolution mass spectrometry (HRMS) in reference and surveillance activities. This will enable the Agency to carry out its diagnosis and surveillance activities more quickly, efficiently and with greater robustness, in order to safeguard public health, in line with the objectives for food chain surveillance set out in the 2023–2027 COP.

In 2025, the DSP will also continue to implement **ANSES's policy of industrial application and partner relations with private players**, adopted and published in 2020, to share and/or make available to private teams the research results, biological resources and data generated by the Agency's laboratories, within a clear contractual framework tailored to serve public health. The objective is to further the necessary development of tools that safeguard health, while complying with ANSES's obligations of independence from private interests. For 2025, a new campaign to raise awareness of these issues among our laboratory staff is planned.

Scientific and institutional cooperation at national level

The DSP will continue to support the laboratories in **developing scientific and institutional partnerships** in an ever-changing context, in line with the orientations set out in the 2023–2027 COP. In particular, the DSP will oversee effective implementation of the framework partnership agreements signed with various French research and technical organisations (INRAE, Ifremer, ACTA, ACTIA, CEA, OFB, etc.), will work to renew others (CIRAD, Inserm, etc.) and will propose new structural partnerships. In each case it will analyse the strategic priorities for partnership development with regard to the needs of our missions, according to the One Health approach.

More generally, the DSP will continue to be involved in the governance and work of the **programme agencies** within the scope of the ANSES laboratories' activities. While liaising with the laboratories concerned, it will continue with its decisive, active participation in implementing the new State-funded priority research programmes and equipment actions (PEPRs), which will be invaluable for our research and reference activities. In this respect, particular mention should be made of the **PEPR on the health of livestock animals**.

The process of **strengthening synergies between NRLs and National Reference Centres (NRCs)** will be pursued in conjunction with *Santé Publique France*, with the aim of further improving mutual knowledge and understanding, which is the basis for deeper cooperation, particularly in terms of contributing to the epidemiological surveillance of zoonoses and non-zoonotic human pathogens.

Lastly, the DSP, along with its partners, will continue joint management of the two epidemiological surveillance platforms, respectively for animal health and plant health (it was not possible to continue coordinating the surveillance platform for the food chain).

Europe and international

As in previous years, the DSP, working closely with the European & International Affairs Department (DAEI), will be devoting significant efforts in 2025 to the forging of **European research partnerships for Horizon Europe**. These are markedly shaping the European research landscape in our fields of activity.

With regard to the **Partnership for the Assessment of Risks from Chemicals (PARC)**, launched in May 2022 for a seven-year period (bringing together nearly 200 partners from 28 countries and three European Union agencies, and with an estimated budget of over €400M), the DSP and the DAEI will remain heavily involved in its overall coordination. The DSP will also continue to coordinate the involvement of ANSES's laboratories in this partnership.

Similarly, the DSP will continue to coordinate the role of ANSES's laboratories in implementing the **European Partnership on Animal Health and Welfare (EUP AH&W)**, and will be directly responsible for several animal welfare initiatives.

The department will also continue to closely monitor the establishment of **other partnerships of interest**, especially the ones on sustainable food systems, antimicrobial resistance according to a One Health approach and pandemic preparedness (for the latter, ANSES's participation will help ensure that the One Health approach is taken into account).

The DSP will continue to be involved in other European partnership initiatives of major strategic interest to ANSES: the **EU-WISH** (EU-Wastewater Integrated Surveillance for Public Health) joint action, preparation of **EFSA's annual report on zoonoses** (EU One Health Zoonoses report), etc.

Lastly, the department will continue to manage the **European Union Reference Centre (EURC) for the welfare of poultry and other small farmed animals**, a reference centre that mobilises dedicated scientific and technical resources from the Ploufragan-Plouzané-Niort Laboratory and several European partners.

3. Laboratory activities for the animal health and welfare theme

Animal health and welfare is an area of excellence for the Agency's laboratories and reflects the strong potential of French reference and research in this field. These activities at ANSES combine high-level scientific skills and technical equipment, animal models and an increasing number of alternative models, field experience in breeding different animal species, and multidisciplinary expertise interfacing with the Agency's other entities responsible for risk assessment and veterinary medicinal products, as well as at the European and international level.

This combination of skills and resources allows the Agency to be particularly responsive in supporting its supervisory ministries in controlling animal and zoonotic diseases and, where necessary, managing health crises. It enables ANSES to apply a comprehensive, integrated and systemic approach to issues of research and assessment in animal health and welfare, taking account of different farming systems and their consequences on animals, on the health of animal production professionals, on the safety of foods of animal origin and their impacts on consumers, as well as possible interactions with wildlife, while not overlooking the specific health risk posed by resistance to antibiotics and antiparasitics in veterinary medicine. It therefore provides the State with the science-based evidence that is essential for entrenching and supporting the implementation of risk management measures in all these areas. Global changes and their impact on the factors of pathogen emergence, development or persistence are also leading ANSES's teams to broaden their activities to cover new hazards and challenges. Lastly, its approach to research questions relating to animal welfare for animal health is an original one that is able to meet society's expectations in terms of quality, safety and ethics in animal production.

The scope of ANSES's missions covers many areas of human, animal, plant and environmental health. It includes recent health events – such as COVID-19 being transmitted to certain animals, avian influenza viruses adapting to mammals, the emergence of indigenous human cases of West Nile fever and the arrival of epizootic haemorrhagic disease and Crimean-Congo haemorrhagic fever on the European continent – that have questioned the links between several of these compartments, placing the Agency at the heart of One Health issues. For the

animal health and welfare theme, this approach now needs to evolve towards a more general concept of "One Health – One Welfare", which the Agency intends to continue integrating into its work programme in the years to come.

The ANSES laboratories' 2025 work programme in the field of animal health and welfare intends to meet the scientific challenges of research, reference, monitoring, risk assessment and support for risk managers in the following areas:

- **developing methods for detecting animal diseases** for analytical reference activities, in order to develop different diagnostic approaches enabling greater precision (sequencing, molecular characterisation) on the one hand, and greater speed on the other, for the earliest possible diagnosis, which could go as far as assisting professionals in dispelling doubts on the farm;
- **understanding the pathogenesis of zoonotic, regulated and emerging infectious animal diseases** or those with a major economic impact on the production sectors, by exploring host-pathogen relationships, from the organism down to the cell or even cell ultrastructure level;
- **epidemiology of these diseases and the various animal epidemics** they cause in France, by combining field investigation approaches with cutting-edge technologies in sequencing and molecular epidemiology, modelling and the detailed study of transmission mechanisms, as well as more comprehensive and systemic approaches;
- **studying the mechanisms behind the crossing of the species barrier**;
- the **effect of co-infection and co-exposure on** pathogen expression;
- **research into new control strategies** for animal diseases, particularly through **vaccine approaches**;
- **improving animal welfare** for the benefit of animal health.

Some examples of the planned 2025 implementation of these major strategic themes are highlighted here.

Animal disease detection methods: monitoring, innovation and adaptation to health crises

In 2025, the ANSES laboratories with national and European reference mandates **will continue adapting their activities** to the **new regulatory context** arising from the Animal Health Law. This concerns new regulated animal diseases such as porcine reproductive and respiratory syndrome (PRRS) and new animal species covered (small ruminants/camelids and llamas for the EURLs for brucellosis, glanders and melioidosis; *Tropilaelaps* spp., for example), production of new reference materials, organisation of new inter-laboratory proficiency tests and adaptation of diagnostic methods; development of certain reference mandates to include support for professionals on health programmes of collective interest, etc. This adaptation will result in an additional workload on top of the classic national and European analytical reference missions.

The development of **increasingly powerful tools for characterising pathogens and their genomes** has opened up numerous opportunities for research, **innovation** and method development to **speed up the diagnosis of infections** (directly on the farm or in the field), **facilitate early detection of highly contagious diseases and identify pathogens more precisely** (such as equine infectious anaemia). For instance, the Agency's **sequencing platforms** are continuing to adapt to growing demand for pathogen identification using whole genome sequencing, through their proficiency in the related tools and their active monitoring of methodological developments, mainly for high-throughput sequencing using **new third-generation sequencing techniques**. This know-how enables these technologies to be deployed in the laboratories: **MinIon** (e.g. African horse sickness, foot-and-mouth disease, West Nile, epizootic haemorrhagic disease), **shotgun** metagenomics for the detection of zoonotic agents, **digital PCR** (analyses of complex matrices, with inhibition phenomena, such as for *Coxiella burnetii*, a useful technique for determining germ viability, etc.), **aptamer**-based technology (various parasites such as *Anaplasma phagocytophyllum*, etc.), with several ultimate objectives including obtaining new screening/diagnosis tools and the prospect of therapeutic tools offering an alternative to antibiotics/antiparasitics. It is also important to continue studying **genomic changes characteristic of particular phenotypes or genotypes** (increased virulence of certain strains of PRRS virus, ability to recombine transmission events, potentially with crossing of the species barrier). Early detection requires techniques that can be used *in situ* for sick livestock animals, and these are being explored in several work programme projects (LAMP for nematodes, avian influenza, etc.). **Serology techniques** will also need to be developed for certain diseases (e.g. serology for Venezuelan encephalitis) or evolve to better characterise immune responses (sequencing of **antibody repertoires** in pigs applied to porcine respiratory complex and pestiviruses), while new methods will need to be developed to maximise positivity threshold values (Q fever).

The increasingly systematic **sequencing** by the reference laboratories of infectious agents they receive not only enables more precise identification but also, thanks to advanced analysis of the sequencing products, provides **decisive support in the epidemiology of infectious diseases**, to gain a better understanding of the origin of the circulating strains. The phylodynamics of pathogens and the identification of transmission chains during infection episodes (e.g. avian influenza, bluetongue, tuberculosis, brucellosis, *E. multilocularis*, etc.) require proficiency in sequencing and analysis of results, but also prior analysis of the reliability of the phylodynamics methods themselves.

Innovation also means continually adding **new matrices to which the current analysis methods must be adapted, and developing new tools**. Whether it concerns improving early detection of an infection, including by adapting to sampling in the farm environment (HPAI, particularly in milk, following contamination of ruminants by the B3.13 genotype in the United States, "debris" for the detection of bee viruses), or studying pathogen transmission more generally (e.g. botulism, tuberculosis, brucellosis, TBEV, echinococcosis, lyssavirus, West Nile and Usutu viruses, fish viruses in coelomic fluid, etc.) by also exploring environmental matrices (dust, water, soil, bat guano, etc.) and various animal products, or analysing the effect of certain organic matter treatment techniques (composting, anaerobic digestion, cheese processing and preservation processes) on the persistence of infectious agents (e.g. agents of Q fever and paratuberculosis, TBEV), **work on methods tailored to multiple matrices represents one of the challenges for the work programme.**

As well as for detecting the pathogens themselves, innovation in methods is also important for determining pathogen resistance to chemicals used for their control. This is the case with the International coordination of research of infectious animal diseases (ICRAD) project METABOL-AR, for example, which will explore the application of metabolomics to detecting resistance to antiparasitic drugs in gastrointestinal nematodes.

The reference laboratories will also be committed to **helping reorganise diagnosis and outbreak reporting schemes** for the infections most likely to lead to animal epidemics, in order to confirm/refute suspicions more quickly, where possible. **Transfers of partial confirmation methods** will be organised, mainly for avian influenza, paying particular attention to the traceability of samples and data along the chain to the NRLs. Similarly, the updating of certain infectious disease control plans will require the close involvement of the corresponding reference laboratories (e.g. paratuberculosis).

The numerous **European and international reference mandates in animal health and welfare** held by the ANSES laboratories give them a very broad view of infectious animal diseases and provide them with invaluable data for **international monitoring** of these diseases. The laboratories therefore devote part of their work programme to building lasting expertise that is recognised at European and international level, for example in the monitoring of foot-and-mouth disease, bluetongue serotypes, epizootic haemorrhagic disease virus, melioidosis, rabies, dourine, surra, etc.

Lastly, it is important to note ANSES's involvement in **providing technical and scientific support for the deployment of public health management policies**: vaccination of ducks against highly pathogenic avian influenza (HPAI) H5, control of bluetongue and epizootic haemorrhagic disease, strategy for the eradication of infectious bovine rhinotracheitis in Europe or enzootic bovine leucosis on Reunion Island, national PRRS control strategy.

Host-pathogen relationships: exploring the sub-cellular level to better understand infectious phenomena

Research on **understanding the pathogenesis of animal diseases and the immune response of animals** will continue in the laboratories, using **a variety of complementary approaches** (ultrastructural, -omic, cellular, functional, etc.), **in order to investigate the relationships between the host (vertebrate and/or invertebrate vector) and the pathogen (bacterium or virus)**.

The projects concern both regulated livestock diseases and other infections which, although not regulated, have a major economic impact on the sectors involved.

This research provides knowledge that **helps the authorities and professionals move forward in the detection and characterisation of infectious diseases** affecting or threatening France. It also enables **better targeting of control measures and leads to new strategies** for disease control.

The **interactions between host and infectious agent proteins** or between **the RNA of pathogens and the cellular proteins of their hosts** are central to several ongoing and future laboratory projects. These include the ZooFlu project, which aims to study the complex interactions between molecular, ecological, social, environmental and epidemiological factors,

in order to identify the mechanisms underlying the emergence of HPAI viruses. Other examples are the continuation of PersIstOmics and PersIFA on foot-and-mouth disease, IPPA on high-throughput mapping of host-virus interactions in African swine fever (ASF), and LAGMED for rabbit viral haemorrhagic disease. The MovieShop project is examining the **modelling of viral interactions** in a structured population organisational scheme, in particular for PRRS and hepatitis E viruses.

This is also the case with studies on tick-borne encephalitis virus (TBEV) with the TBEVAlim project, which is seeking to gain a better understanding of host-pathogen interactions in order to identify the mechanisms behind the most serious complications of this emerging disease and determine the effectiveness of treatments following food contamination.

The effect of climate change on virus-host interactions is also on the work programme (e.g. PNR EST HEALTHSEA or Aquaterm on fish diseases).

These molecular approaches are also deployed to better characterise the interactions between virus vectors and hosts. For example, they can be used to explore in greater detail the role of the tick immune system in the persistence and transmission of viruses, as planned in the SIROCCO project on Crimean-Congo fever, or Ixotick, which is studying the interactions of the Kemerovo virus (of the genus Orbivirus) with its vector *Ixodes ricinus* and the role of the tick's innate immunity in controlling viral replication.

Lastly, some novel projects are now focusing on the interactions between pathogens and the "host or vector + its microbiota" entity, also known as the ***holobiont***, in order to determine the impact of these microbiota on the response of the host or vector to the infectious agent.

These different approaches (ultrastructural, -omic, cellular, etc.) are now seen as essential tools, used to **provide answers** to fundamental questions on the pathogenesis of micro-organisms: **cycles, transmission routes and mechanisms** (e.g. Usutu, TBEV, airborne pathogens); **host adaptation** (e.g. swine influenza virus, chlamydia); **virulence markers** (e.g. West Nile); **recombination effects** (e.g. PRRS); **co-infections** in hosts (porcine respiratory complex) or in vectors (ticks, parasite viruses); **crossing of the species barrier** (coronaviruses, avian influenza, swine influenza). This information is essential to strengthen disease control methods by providing knowledge of host-virus interactions coupled with epidemiological modelling work (enzootic bovine leucosis).

Better understanding of pathogen-animal-environment interactions

Understanding infectious phenomena in animals also requires investigation of the environment in which the animals are reared and the role potentially played by certain environmental compartments in the perpetuation, development and/or transmission of pathogens. Several infectious animal diseases have a strong environmental component, and this is evolving as a consequence of global changes, particularly climate change. The **role of the environment in the transmission of pathogens to domestic animals** is therefore being explored for the study of several infectious animal diseases such as **brucellosis**, **chlamydia**, **melioidosis**, **tuberculosis**, **animal botulism** and **avian influenza**. Bees are also being studied, for example to investigate the holobiont's responses to environmental disturbances, particularly invasive pests

(HOLOBEEONT). All these projects call on a variety of approaches, whether epidemiological or concerning the analysis of favourable and unfavourable environmental conditions. One example is **multi-criteria approaches**, used to assess health situations according to biotic and abiotic factors and economic and social contexts, particularly on pig farms.

The previously mentioned studies on the **adaptation of analytical methods to complex environmental matrices** also make a major contribution to the exploration of these pathogen-animal-environment links, whether for echinococcosis, botulism or Q fever, for example.

Lastly, the ecosystems in which farmed animals live include other wild species with which they may interact, directly or indirectly. The study of pathogen-animal-environment interactions also involves **exploring the receptivity/sensitivity of wild animals to infectious agents of interest, in order to identify possible environmental reservoirs of infectious diseases** (projects on wildlife relating to tuberculosis, Q fever or botulism, for example, work to map the risk of TBEV in France, as well as several European projects on bats and rodents, relating to risks of emergence).

New control strategies

Advances in knowledge of infectious agents and their molecular interactions with the host (vector or definitive host) on the one hand, and lessons learned from recent health crises affecting or threatening France on the other, generate both opportunities and needs for the development of new strategies to combat animal diseases.

Many of the projects in the laboratories' work programme are geared to this objective, starting with research on **vaccination**: the campaign to vaccinate **ducks against avian influenza** will continue during 2025. Regarding the ASF vaccine, work will continue on verifying the safety and stability of a heat-attenuated strain produced on an epithelial cell line; the idea is to move towards industrial transfer for a vaccine.

Vaccination studies will also continue on diseases such as **PRRS**, particularly on phenomena of recombination between vaccine strains; and on **autogenous vaccines** for control of ***Streptococcus suis*** via the study of the interaction between tonsil microbiota and the efficacy of these vaccines. Research on **new vaccine strategies** will take place, in particular the **SPIDVAC** project (2022–2025), under a Horizon Europe call for proposals, which will give ANSES the opportunity to test the best approaches to define new vaccines for **African horse sickness**.

Research is also being carried out to identify **new strategies to enhance vaccine immunity in newborn animals**. Intra- and interspecies proteomic analyses of the *Trichinella* genus will continue, in order to identify virulence factors and antigenic targets of diagnostic or vaccine interest. Vaccination against an avian coronavirus using an RNA vaccine will be assessed.

Original research on vectors is also included in these scientific advances, proposing an approach using **vaccines directed against the microbiota of ticks** and other vectors, to control vectors and vector-borne pathogens.

Lastly, together with the French Biodiversity Agency (OFB), ANSES will continue managing a project to **vaccinate badgers against bovine tuberculosis** in the Dordogne *département*. This

will include an assessment of the immune response of badgers to *M. bovis* infection and vaccination.

It should be noted that as part of the support in combating health crises provided by the NRLs to the authorities, **the programme to vaccinate poultry against avian influenza** being rolled out across the country during 2024–2025 will be accompanied by significant analytical activity to monitor this vaccination, coordinated by the NRL.

These vaccination strategies will need to be accompanied by the development of tests, such as the one for *M. bovis*, based on quantitative PCR with high-resolution melting curve analysis (qPCR-HRM) to differentiate the vaccine strain from wild strains in circulation.

Other antiviral strategies are being investigated in addition to vaccination. Several projects in the work programme focus on research and assessment of **antiviral substances** against various pathogens, in particular, orbiviruses and certain viruses affecting the human and equine central nervous systems (flaviviruses such as TBEV, West Nile disease and alphaviruses responsible for equine encephalitis). Moreover, as part of the creation of the GenHomEqui contracted unit with Inserm's DYNAMICURE unit, for developing One Health translational research in animal health (horses) and human health, and based on work on antiviral compounds active against equine viral arteritis, translational studies will be carried out in the field of nidoviruses, among human viruses of the coronavirus family: SARS-CoV-1, SARS-CoV-2.

Another major thematic area of the work programme on control strategies is the **work on resistance to pesticides and the search for alternatives**. In particular, the **HARIZONA** project is being set up to prove the benefits and feasibility of implementing **integrated management of strongylosis** by introducing complementary methods combined with the rational use of anthelmintics **in suckler sheep herds**, and providing tools and references for the effective deployment of this management, while taking account of the impact of climate change. Moreover, the creation of the **SABOT joint technology unit**, which brings together ANSES's PhEED Unit and the French Horse and Riding Institute (IFCE), is facilitating studies on the **resistance of certain horse nematodes to antiparasitic treatments**, through close collaboration with horse owners and breeders. Moreover, a new group set up within the research team will focus on the search for a new strategy to combat resistance to anthelmintics, based on the detection of new targets, mainly G protein-coupled receptors (GPCRs), but also by targeting the viruses found in these parasites.

Animal welfare: studying new livestock farming methods through an integrated approach to animal health, public health, animal welfare and biosecurity

The animal welfare research projects in the work programme focus on the multi-criteria assessment of **new alternatives to conventional livestock farming methods**, with an emphasis on an integrated approach. Following on from the PIGAL project, which helped draw up a classification of farms, the **MiMé-PIG project** is seeking to identify metabolomic markers in sera and microbiotic markers in faeces, with a view to predicting or specifying pig welfare situations: those involving *Salmonella* will be addressed through two approaches, carriage on the one hand and serology on the other.

Regarding **poultry**, projects such as **BroilerNet** are bringing together European poultry sector players in order to improve compliance with biosecurity measures and suggest innovations for sustainable production, while taking animal welfare into account.

Work relating to **goats** will also be carried out, mainly in the European Partnership on animal health and welfare (**PAHW**), with studies on the validation of positive welfare indicators in goats, by comparing groups having access to various types of environmental enrichment with others in standard conditions.

As the **EURC** for the welfare of poultry and other small farmed animals, ANSES will continue its work on indicators for assessing the welfare of poultry and rabbits on the farm, during transport and at the slaughterhouse, and will carry out work on documenting poultry depopulation methods during epidemics.

In terms of reference activities, ANSES also contributes its expertise to the work of the NRC for animal welfare.

Lastly, the Agency will continue its participation in the work of the **"One Welfare" joint technology network**, which intends to build a network for multidisciplinary exchanges between biotechnical sciences and the human and social sciences. It aims to jointly promote human and animal welfare by acting on the human-animal relationship and the design of livestock farming systems.

Animal models and alternatives

ANSES maintains and uses a set of animal models that enable it to link mechanistic studies at the cellular or molecular level with the reality of the response of complex animal organisms. Not only can these animal models provide an appropriate response to questions on the **pathogenesis of infectious diseases** or the **effectiveness of control measures**, but they are also used to validate certain alternative models developed by the teams within the ANSES laboratories. These models are **intended to replace experimentation on target species** wherever possible. They include smaller fish (Medaka model), *ex vivo* chicken lymphocytes or *Caenorhabditis elegans* nematodes to replace whole chickens, or pig or chicken organoids for viral or coccidial propagation.

This is also the case with the study of neuropathogenesis induced by West Nile virus or TBEV using 2D/3D models of the human nervous system (viral replication, innate immune response, neuronal death).

Animal health and welfare at the centre of many cross-cutting research projects at ANSES

Many of the animal health and welfare projects in the ANSES laboratories' 2025 work programme have cross-cutting and/or inter-sectoral themes.

Resistance, food safety and epidemiology: animal health and welfare are naturally addressed in several projects on **antimicrobial resistance** (e.g. mycoplasmas and antimicrobial resistance), **food safety** (e.g. hepatitis E) and the **surveillance and epidemiology of infectious diseases** (e.g.

predictive or evaluative modelling of ASF and HPAI, molecular epidemiology and surveillance of HPAI, the OMAA observatory for honey bee mortality and weakening, the surveillance network for causes of equine mortality (RESUMEQ), understanding of the epidemiology of Q fever, etc.).

Exposome: other cross-cutting themes under development in this work programme include studies on **co-exposure of animals to infectious agents and chemical contaminants**. **Two families of animal species are pioneers in this field: bees and fish**. Some projects are focusing, for example, on the identification of biological response signatures (metabolomics and/or proteomics) following exposure of honeybees and wild pollinators (WildPosh) to pesticides or pathogens, in order to better understand the cause of the observed mortality through the detection of specific biomarkers. In fish immuno-ecotoxicology, studies are focusing on the impact of endocrine disruptors on the thyroid and immune systems and the microbiota of different tissues. It is also important to mention the work on assessing **neuropathological effects** following dietary exposure of "humanised" transgenic mouse models to a mixture of pesticides at low doses, as well as the epidemiological study of the effect on the health of cattle herds of exposure to electromagnetic and electrical waves.

Climate change: another cross-functional theme has emerged in relation to **global changes**, particularly **climate change**. Environmental and climate factors are taken into account in multi-criteria assessments of livestock health and welfare, with highly specific projects such as EchinoSafe, as well as much broader ones such as those on Lyme borreliosis and circulation of West Nile virus or HPAI (Camargo).

Human sciences: cross-cutting links between the **biological sciences and human and social sciences** should also be mentioned among the cross-cutting themes of this work programme. Citizen science is contributing to a project to better understand and assess the risk of tick bites in urban and suburban environments (private gardens) or during recreational activities in forests (orienteering). Socio-economic components will be integrated into work on modelling the spread of infectious diseases such as avian influenza or African swine fever.

Pivotal European partnerships

Following the European Commission's acceptance in 2023 of the EUP AH&W as part of the Horizon Europe programme, the Agency has been working with its partners on its scientific and strategic implementation, as well as on planning the first external calls for projects in late 2024–early 2025. This European partnership is expected to be the keystone of European research and reference in animal health and welfare for the next decade.

4. Laboratory activities for the plant health theme

The increased frequency, volume and diversity of world trade in plant products, climate change, changes in farming practices and crop management techniques and the unintended effects of plant protection products (PPPs) are now identified by all the parties concerned – production sectors, risk assessors and managers, consumers and citizens – as crucial factors in the plant health context. The issues resulting from plant pests and the related means of control and management – whether in metropolitan France or in the overseas territories – need to be addressed on all fronts with approaches related to risk anticipation and assessment, sustainability of plant protection practices and food sovereignty.

Our reference, research, surveillance support and expert appraisal work for plant health involves the following entities:

- the **Plant Health Laboratory (LSV)**, which works on biological risks to plant health in cultivated, forest, natural and urban environments, including quarantine of imported plants and plants introduced under import regulation waivers. The LSV's scope also covers detection and identification of genetically modified plants;
- the **Lyon Laboratory** studies resistance to PPPs through its CASPER contracted unit for Characterisation and Monitoring of Phenomena of Pesticide Resistance Development in partnership with INRAE's Plant and Environmental Health (SPE) Department, and assists with epidemiology and national surveillance through its Epidemiology and Surveillance Support (EAS) Unit.
- The ANSES laboratories' work programme proposes a comprehensive approach to plant health and protection, which:
- involves studying **pests' interactions with plants and their environment**;
- mobilises expertise while **interfacing** with the Agency's other entities responsible for **assessing biological risks to plant health and PPPs**;
- contributes to training through research, by hosting and supervising doctoral students. The theses under way mainly focus on the use of **new tools for the detection and characterisation** of pests (liaising closely with the reference mission), the study of their **genetic diversity**, **epidemiology** and **vectors**, as well as the study of the **mechanisms of emergence of resistance to PPPs** and their genetic basis.

From the European Union to the French overseas territories: a renewed regulatory framework currently being finalised

The **European regulations on plant health** (Regulation (EU) 2016/2031, Delegated Regulation (EU) 2019/1702, Implementing Regulation (EU) 2019/2072) list quarantine pests for the EU that are subject to specific surveillance plans set up by each Member State. Emerging pests are subject to emergency measures on a case-by-case basis. At the same time, **biological surveillance in France** is implemented at national level. This concerns these regulated and emerging pests, as well as resistance to PPPs (guidance note on the "Unintended effects" section), which is monitored by the DGAL. France retains the option of taking action on its territory against certain pests that are no longer listed at European level, and since the **French Overseas Departments and Regions (DROM)** are now considered as third countries, **specific corresponding regulations** will be put in place for the period covered by this work programme. As one of the most salient aspects of the new European regulations is their **evolving nature**, our analytical capabilities and study topics are also required to evolve, by integrating more generic methodological and technological innovations or, conversely, those capable of discriminating below the species level. All these changes have an impact on our ability to carry out early pest detection and epidemiological surveillance. Since 2018, the improvement in this latter scheme has been due to the work of the **epidemiological surveillance platform for plant health**, created following the *Grenelle* Environment Round Table in 2007 and the *Etats Généraux du Sanitaire* consultation on the health sector, launched in 2010.

Within the European framework, Commission Delegated Regulation (EU) 2019/829 on protective measures against pests of plants for scientific or educational purposes or varietal selection has also entered into force, and affects the framework of both our activities in confined environments and our assessments of applications for approval from the various players.

Lastly, **Regulation (EU) 2017/625 on official controls** led the European Commission to set up European Union Reference Laboratories (EURLs) in plant health, whose activities started in 2019. Our three EURLs (fungi and oomycetes, insects and mites, plant-parasitic nematodes) will enter the fourth work programme, with the main objectives – besides the organisation of ILPTs and training courses for EU NRLs on the detection of regulated pests – being methodological development work to respond to regulatory changes.

On the other hand, the regulations on genetically modified plants and their deliberate release into the environment, while established for "first-generation" genetically modified organisms (Directive 2001/18/EC), have yet to be finalised and are still at the proposal stage for **plants derived from new genomic techniques (NGTs)**.

From the regulatory framework to health crises in the field: increasingly numerous major health issues

Against this background, our laboratories are involved in addressing a growing number of major health issues from one work programme to the next. While we have been working for a decade on the ***Xylella fastidiosa*** bacterium and for several years on the bacterium responsible for yellow dragon disease or **huanglongbing (HLB)** and on the **pinewood nematode**, **emerging tomato viruses** (ToBRFV, ToLCNDV, ToFBV), **Panama disease** in banana crops due to the fungus FocTR4, the **oriental fruit fly**, **lethal yellowing palm disease**, **thousand cankers disease** on walnut and **citrus spiny whitefly** will also be very important during the period of this work programme. At the same time, future regulations on **NGT plants** will provide new guidelines on new techniques for **detecting the corresponding transformation events**. Lastly, with regard to PPP resistance, the transition of the monitoring plan will go ahead, with particular emphasis on **biocontrol methods**.

ANSES's laboratories will (i) participate in **coordinating the national epidemiological surveillance platform** for plant health, run with the DGAL, INRAE, the FREDON network, ACTA, the Chambers of Agriculture and CIRAD, and (ii) jointly lead or participate in **thematic working groups** (co-leading the "*Xylella fastidiosa* surveillance" working group with the DGAL and INRAE, co-leading the HLB working group and participating in working groups on Foc TR4, grapevine decline, pear decline and the pinewood nematode), in addition to groups focusing on surveillance schemes for regulated or emerging pests and on methodological work (international health monitoring). In addition, by making our data available to the platform as needed, and through our close involvement in **cross-cutting support** (epidemiology, biostatistics, IT) and **scientific support** in analytical fields, our contribution to its activities will become further entrenched.

For all the pests that make up this ever-larger health landscape, we will also continue to promote our methods at the European and international level (EFSA, EPPO or IPPC panels and working groups, other EURLs).

Standards, technologies and methodologies that guarantee innovation and quality

With the requirements of the European regulations on accreditation and the need for more effective methods, our involvement in the reference mission will be characterised by implementation of **ISO/IEC standards: 17025 for analyses and 17043 for inter-laboratory tests**.

For our research mission, while always striving for optimal dialogue with our reference counterparts, our methodological efforts will focus on **innovative detection and identification techniques**: barcoding and metabarcoding, multiplex and multi-purpose PCR tests, digital PCR, high-throughput sequencing techniques (Illumina, MinIon) encompassing the detection of emerging resistance to PPPs, and implementation of bioinformatics pipelines. Technological innovation using high-throughput sequencing will also help improve post-entry plant quarantine to meet new regulatory requirements.

For genetically modified organisms (GMOs), the characterisation of techniques for **detecting and identifying polymorphisms at the nucleotide level** will continue, to enable identification of plants derived from NGTs, and we will maintain our excellence in validating the detection of new GMO events or improving extraction methods, having joined the European Network of GMO Laboratories (ENGL).

Bioinformatics will play an increasingly important part in the laboratory's activities, although it is important to underline that **morpho-biometric methods** for identifying nematodes and insects and biological tests of PPP resistance – particularly relating to insecticide-resistant insects – will continue to require considerable effort in a context of increasing scarcity of skills that remain crucial in view of the corresponding issues.

Lastly, as part of the Horizon Scanning for Plant Health project with EFSA, an **innovative methodology for monitoring** the media and scientific literature will remain in use for the early identification of new emerging or re-emerging pests within the EU, consistent with the expectations of the regulations and in the context of the second phase of the corresponding collaborative project.

Structured partnerships that reflect our growing recognition within the scientific and technical community

Not only will 2025 see the continuation or launch of national and international collaborative research projects (DSF, CASDAR, Ecophyto, ARTEMIS Interdisciplinary Programme, ANR, Euphresco, Horizon Europe, EFSA, twinning, AFALULA), but doctoral training (current and future theses) will now concern all the disciplines and units of the two laboratories involved, with co-funding from INRAE, CIRAD, technical institutes for CIFRE agreements (Inov3PT) and the regions (Occitanie). The research questions addressed will incorporate several cross-cutting themes:

- **Identification, detection and characterisation of pests:**
    - For the collaborative projects: CASDAR PHYDEMO on the study of phytoplasmas in fruit trees; Graines d'ARTEMIS (LabEx ARBRE laboratory of excellence) BARBARIC, which uses third-generation MinIon sequencing and long barcodes to identify fungi or oomycetes; INTERREG (EpiBio OI2 on banana pests) and FEDER-COMP (SABRE on rice leaf bacterial blight), which concern countries of the south-west Indian Ocean and East Africa;
    - For the theses: ANSES-INRAE OptiCQua (Optimising the performance of health diagnosis of *Vitis* spp. subject to certification and quarantine schemes); another ANSES-CIRAD project that began in late 2024 concerns Panama disease on banana crops;

- **Epidemiological approaches to the study of pests:**

    - For the collaborative projects: ANR Phytovirus to study virome diversity in wild plants as epidemiological reservoirs; EFSA ETHICS on populations of citrus black spot in Tunisia and its epidemiology under Mediterranean conditions; PINIPOP on Scots pine blister rust populations in the Landes forest on behalf of the DGAL-DSF;

    - For the theses: CIFRE with Inov3PT on the study of the diversity of *Ralstonia solanacearum* in metropolitan France; ANSES-INRAE SYCO-Protect on maple sooty bark disease; ANSES-CIRAD EVINCER on the emerging nematode *Meloidogyne graminicola*; ANSES-INRAE AEFFISCIANS on the analysis of the effectiveness of collective and individual anti-sharka strategies;

- **Emergence of pests and resistance to PPPs – from diagnosis to anticipation:**

    - For the collaborative projects: Darwin (HORIZON Europe), which proposes an innovative NGT plant detection strategy; High Value Citrus for AlUla 2 (HVCA 2), a citrus orchard and nursery monitoring programme in AlUla (Saudi Arabia); ANR AgriBiodiv on the influence of agricultural practices on the level of services and disservices provided by field margins; SORE in SPORE (use of broad-spectrum insect attractant traps to detect forest pathogenic fungi as part of the monitoring of regulated and emerging organisms) funded by the DGAL-DSF; Horizon Europe NEM-EMERGE, which aims to counter the emergence and proliferation of invasive and virulent soil nematodes; CESAB FELLOW, on the impact of agricultural practices on the functional properties of plant communities found in different crops; ANR and PNR-EST on the transgenerational plasticity of insect models exposed to sublethal doses of insecticides; PARSADA on anticipation, coupled with monitoring, of the effects of the potential withdrawal of active substances on the development of resistance to the remaining PPPs;

    - For the theses: FCPR virology on the emergence of diseases linked to the introduction of new species; ANSES-INRAE CRISPPEA on NGT gene editing in peas for rhizospheric interactions; ANSES-Occitanie Region FLAVI to assess the services and disservices provided by weed flora in vineyards.

These various projects result from structural alliances with our research partners. Our partnerships in the following areas will continue:

- the Pesticide Resistance Forum and Research **(R4P) network** with scientists from four INRAE laboratories (Provence-Alpes-Côte d'Azur, Nouvelle-Aquitaine Bordeaux, Bourgogne Franche-Comté and Versailles-Grignon), an expert from the DGAL, and the CASPER contracted unit (INRAE's SPE Department);
- the **CASPER contracted unit** (INRAE's SPE department);
- the **NemAlliance cluster** (INRAE Brittany-Normandy Centre) for the study of plant-parasitic nematodes;

- the **Mycology contracted unit** (INRAE's Ecology & Biodiversity Department) for the study of fungi and oomycetes that are pathogens of forest tree species, which is about to begin its second five-year mandate;
- the **DiagEpiTrop partnership** between our unit based on Reunion Island and CIRAD. In its "DiagEpiTrop 2.0" version, it has been able to broaden the geographical and thematic scope of collaboration on emerging pests for the French overseas territories and the South-West Indian Ocean/Southern Africa/East Africa region.

In addition, together with INRAE, we will begin setting up **associate partner laboratory status** for our Entomology and Botany Unit on the Montpellier site with the Centre for Biology and Management of Populations (CBGP) joint research unit.

Contribution of the plant health laboratories to two major pivotal challenges: One Health and climate change

Climate change can have an impact on plant health from three angles: plant immunity, associations of pests and their possible vectors, and biodiversity, including at agro-ecosystem level. In this context, the new topics we will be working on include the effects of climate change **on pest establishment, spread and impact, on the risks of emergence** due to **changes in the ways** organisms interact with plants or the **introduction of new crops**, and on the **levels of (dis)service** provided by weeds or any other group of organisms from agro-ecosystems.

In addition, climate change could influence the **response of pest species to PPP treatments**, and research projects have been proposed to study this impact.
One Health approaches will also be systematically encouraged, particularly with in-house partnerships enabling the development **of cross-cutting methodological approaches** with other fields (digital PCR, high-throughput sequencing and bioinformatics) and external partnerships such as collaborative projects and co-funded theses (pests with **impacts on human health**, the link between weed populations, agro-ecosystem health and the ecosystem services provided, use of **sentinel species** for generic monitoring).

5. Laboratory activities for the food safety theme

Food safety is a major and historical area for the Agency, and interacts strongly with four other cross-functional themes (animal health, antimicrobial resistance, exposure-toxicology, epidemiology-surveillance). The laboratory activities carried out under this theme cover all of the main food production sectors, from farm to fork, in addition to drinking water. They are largely in line with national and European reference mandates and contribute to monitoring programmes for chemical and biological contaminants potentially found in food and water, and affecting public health. Research in food safety is carried out to meet the increasingly complex and integrative expectations for healthy, safe and sustainable food, taking the consequences of climate change into account. This work generates original data and new knowledge for risk assessment, and provides scientific input for public decision making.

Major health challenges identified and anticipated throughout the food chain

The Agency's laboratories involved in food safety conduct reference, surveillance, research and expert appraisal activities on a vast number of chemical, biological and microbiological contaminants that may be responsible for adverse effects, infection and/or food poisoning in humans. The information presented below will focus on microbiological hazards, while **information on chemical hazards of natural or anthropogenic origin is detailed in this document under the "Exposure to and toxicology of chemical contaminants" theme**.

The exercise of **reference mandates is an essential and major mission** in food safety, placing the laboratories at the heart of the reference system supporting the French and European competent authorities with regard to the obligations of Regulation (EC) 2017/625 on official controls. The Agency has national reference mandates for foodborne microbiological contaminants (*Salmonella* sp., *Listeria monocytogenes (Lm)*, enterotoxin-producing staphylococci, *Campylobacter* sp., *Vibrio* sp. in fishery products, micro-organisms in drinking water, viruses in foodstuffs of animal origin excluding shellfish, foodborne parasites, *Echinococcus* spp. and contamination of fresh produce such as salads, strawberries and other berries) and biological contaminants (histamine, marine biotoxins), and EU reference mandates for *Listeria monocytogenes* and coagulase-positive staphylococci. This structuring provides it with an **effective analytical arsenal geared to** all the contaminants covered by the reference mandates, and enables it to supply and transfer the newly developed and validated methods to all the approved laboratories responsible for first-line analyses. In addition, the **Central Veterinary Laboratory** (LCSV) is a part of the Agency and covers the official first-line analyses for several French *départements* (75, 91, 92, 93 and 94) under an agreement with the authorities (DGAL and Paris Police Prefecture).

Collecting or supporting the collection of **surveillance data** associated with microbiological and biological contaminants is a major challenge for assessing their changes through space and time. This approach is mainly based on the identification and in-depth characterisation of micro-organisms for the detection of emerging or re-emerging circulating clones, particularly virulent strains or strains belonging to a particular cluster. During 2025, therefore, the

laboratories will be able to implement complementary analytical methods for monitoring and control plans or official controls for *Listeria*, *Salmonella*, *Campylobacter,* enterotoxin-producing *Staphylococcus aureus*, *Clostridium botulinum*, *Bacillus cereus*, *Cronobacter*, hepatitis A virus, norovirus, histamine, biogenic amines and marine biotoxins. As part of the monitoring of these pathogens, the laboratories will carry out whole genome sequencing on a selection of proposed isolates validated with the DGAL.

All ANSES laboratories working on the food safety theme contribute in their respective areas of activity to the microbiological investigation of clustered episodes of human cases, outbreaks of foodborne diseases and food- or water-borne infectious diseases in conjunction with the competent authorities responsible for coordinating investigations, and the NRCs. In addition, although there is currently no reference mandate, work will be carried out to characterise *Bacillus cereus* group strains, identify *Bacillus thuringiensis* potentially present in toxic episodes, and isolate and characterise *Yersinia enterocolitica* during investigations of foodborne illness outbreaks.

ANSES's teams will continue participating in the various working groups of the **surveillance platform for the food chain (SCA)**, while not retaining the Agency's coordination role. This platform provides support and drives the development of food safety monitoring, for the structuring and management of integrated databases, in a spirit of unity among all food-chain players. All the data collected, in particular on identification and characterisation of contaminants in the various food production sectors, will be exploited to support **work on risk assessment**, refine work on **source attribution**, and contribute to the **investigation of microbiological contamination from farm to fork**.

The food safety research carried out by the Agency's laboratories generally aims to i) gain a better **understanding of the behaviour and circulation of pathogenic micro-organisms and their toxins** throughout the food chain and in other related environmental ecosystems (SaToRix project on staphylococcal enterotoxins, AMI Clost'envir project on *C. difficile* and *C. perfringens*, Casablast project on *Campylobacter* and *Salmonella*, Into the Waste project on the hygiene quality of compost, Chaboté thesis on botulism in ponds, LaMaBac project on *Bacillus cereus*, PaperFish and Animode projects on the distribution of zoonotic parasites in fish), ii) extend knowledge on the **mechanisms of adaptation to various environments during processing** (VIBRATO project on the viability of bacteria subjected to stress, Salmo-Bond thesis project on *Salmonella* adaptation factors in pig and dairy environments, Physallis thesis project on the physiological state of *Listeria monocytogenes*, AMI TBEV project on tick-borne encephalitis virus and its persistence in raw milk and raw milk cheeses from goats and cows), iii) identify the **factors involved in virulence, toxinogenicity, resistance and persistence** whether in the animal sectors or the production environment (MARESISTOME project on the role of coastal ecosystems in the spread of antimicrobial resistance, BIOCLIM project on *Lm* and *Salmonella* in the dairy and pork sectors, ANR ClostAbat project for characterising potentially emerging bacterial hazards such as *C. difficile* or re-emerging ones such as *C. perfringens* in the cattle, pork and poultry sectors, ToxBc project on the detection of diarrhoeal *Bacillus cereus* toxins by mass spectrometry, AMI Shiny-Visa project on *Salmonella* and the prediction of virulence levels). New, more integrative approaches are being developed, such as on interactions between pathogens, and also **host-pathogen interactions**, in particular with the gastrointestinal microbiota in animals (Bter project). In addition, work has been initiated to

improve understanding of the **interactions between chemical and microbiological contaminants** or other biological and environmental parameters (SUBLIM project and Interaclim thesis on *Lm* for surfaces in production plants) in order to better define and characterise the nature and complexity of **exposomes**. This work provides data for **risk assessment** and for defining **innovative approaches for the control** of zoonotic pathogens (Rezolve and Bter projects).

Technological and methodological innovations for the detection of emerging hazards

The recent organisation of whole genome sequencing (WGS) activities at the Agency, with the support of the in-house NGS and IdentyPath platforms, as well as the deployment of tools for the bioinformatics analysis of genomic data, have enabled the WGS approach to be progressively rolled out for major pathogens. This action will be continued and expanded in 2025 as part of reference and monitoring activities on microbiological contaminants, following the agreement reached with the DGAL. Actions will be planned according to the resources available, in connection with the structuring of **bioinformatics** systems tailored to data analysis and processing, in particular with the support of the SPAAD shared service recently set up for the Laboratory for Food Safety and the Laboratory for Animal Health, and of the in-house NGS platform run by the Ploufragan-Plouzané-Niort Laboratory. **Metagenomic approaches and characterisation of the mobilome, resistome and pathobiome** will also be developed in the framework of research projects for studying microbial communities in complex samples (AMI Asteroide metagenomics project, OMEVIB thesis). More generally, "-omic" type approaches will be favoured; this is why **metabolomics** studies will be undertaken in partnership with the CNAM's agri-food chair and within the METABIOT contracted unit. **Transcriptomics** work will also be carried out to understand the factors influencing the production of bacterial toxins (Estaph thesis with the CEA).

In addition, technology using **digital PCR** will be deployed and assessed in the framework of the DIGIDIAG cross-cutting project involving five of the Agency's laboratories interested in the tool, in particular for counting food pathogens (PATHODIGIT project).

Work using mass spectrometry will be developed for the detection of *Bacillus cereus* emetic toxins (AMI ToxBc project). **The investigation of Raman microspectroscopy technology**, in collaboration with the CEA, will be pursued and assessed to determine the viability status of *Listeria monocytogenes* and *Vibrio* in workshops in the fishery products sector (VIBRATO project).

Work will continue on molecular and cellular approaches developed in food virology to assess infectious risk. Work using cell-based assays and **impedance measurement** will be continued and applied to different viral models, including SARS-CoV-2; different potential transmission routes of the virus will be explored through the DIVA project (Digestive tropism and Intestinal pathology of SARS-CoV-2 VAriants: exploration through *in vivo* and *vitro* models) funded by the EMERGEN consortium for the faecal-oral route and the H2O SARS CoV project for the water-borne route.

National and European partnerships to improve understanding of hazard characterisation in a One Health approach

Reference activities and research work on the identification and characterisation of microbiological and biological contaminants in food will need to complement those of our partners in other sectors or ecosystems, in a **One Health approach**. To achieve this, **links with the NRCs in human health** will be consolidated and strengthened, particularly for *Salmonella* and *Listeria*, as part of investigations of human cases and identification of food sources of contamination, and in the context of shared research to capitalise on existing biological assets and strain collections. In order to facilitate these exchanges, it will be necessary to set up the **means for sharing existing databases** while being mindful of confidentiality constraints. Specific actions to foster these closer ties will be carried out jointly with the DSP and the ANSES DATA project manager, who began work in July 2024.

Research work will be encouraged with national research organisations, especially those working with ANSES through partnership agreements or which are partners on thesis topics (INRAE, CEA, Ifremer, Inserm, universities, veterinary schools, OFB, etc.).

Similarly, work in **partnership with EFSA** will continue within the "tailor made" projects recently set up to encourage research between Member States and generate new data for risk assessment. In addition, EFSA is continuing to lead and coordinate the scheme enabling Member States to transmit and compare genomic data from WGS of foodborne pathogenic bacteria, in conjunction with the European Centre for Disease Prevention and Control (ECDC). ANSES is closely involved in this European **One Health Molecular Typing System** structure for surveillance and investigation of the targeted pathogens (initially *Listeria monocytogenes*, *Salmonella* and STEC), including through its EURL *Lm*. Within this framework, ANSES acts as the national coordinator for data transmission and for laboratories providing data (transmission mobilising the NRLs for *Salmonella* and *Listeria*).

European collaborations are also continuing as part of the Horizon Europe programme. Ongoing European projects incorporating environmental aspects and food waste, which could generate new emerging or re-emerging health hazards, include FOREWARN on the occurrence, fate and behaviour of emerging pathogens in coastal surface waters as part of the "Aquatic Pollutants" programme, HOLiFOOD for a holistic approach to tackling food system risks in a changing global environment, and Up4Food on the upcycling of side streams with the aim of obtaining sustainable, healthy ingredients and new food concepts.

6. Laboratory activities for the antimicrobial resistance theme

Antimicrobial resistance is a major public health problem with a wide-ranging impact, involving issues of treating humans and animals, but also threatening our ecosystems. In the animal sector, the two EcoAntibio plans deployed since 2012 (2012–2016 and 2017–2022) have achieved very significant numerical objectives in reducing animal exposure to antibiotics and the prevalence of resistant bacteria in these populations. A third plan (2023–2027) has been launched and 2025 will enable new work to be carried out by ANSES's laboratories as part of this plan's first call for projects. This plan will also form part of a cross-sectoral contribution structured by the Interministerial Roadmap (FIM) to combat antimicrobial resistance, which was adopted in late 2024.

ANSES's "Antimicrobial resistance" cross-cutting strategic theme aims to coordinate and promote synergies in the Agency's various skills on this issue, in order to provide the public authorities with support and scientific expertise in line with its comprehensive approach (One Health) at the national, European and international level.

More specifically, the Agency is working on three major tasks related to its missions. These concern:

- **monitoring trends in development** of the main resistance phenotypes and identifying emerging threats in the animal, food and environmental sectors, especially with regard to uses of antimicrobials of particular importance to humans (cephalosporins, fluoroquinolones, carbapenems, etc.);
- **characterising antimicrobial resistance genes and genetic carriers** and their dissemination in these same sectors, and in an integrated approach including the human and environmental sectors;
- **monitoring animal exposure to antibiotics** through monitoring or surveys of sales of veterinary antimicrobials (carried out by the ANMV), developing **alternatives to antibiotics**, and analysing the associated **impacts** in the context of various experimental models for studies, whether mathematical or biological, *in vitro* or *in vivo*.

Strengthening the effectiveness of our surveillance schemes

Implementation of **regulatory analyses within the framework of the NRL's activities** has been stepped up since 2021, in line with changes in the European regulations (Commission Implementing Decision (EU) 2020/1729). It remains on an alternating annual schedule – poultry in even years (2024), pigs and calves in odd years (2025) – and focuses on the search for antimicrobial resistance among the bacteria *Campylobacter* spp., *Escherichia coli* and *Salmonella* in animals on arrival at the slaughterhouse (caeca) and during distribution (retail meat). Having been limited since 2016 to the species *Campylobacter jejuni* in poultry, it now includes *C. jejuni* and *C. coli* in poultry, pigs and calves.

At the same time, the Agency will continue to operate and consolidate **other antimicrobial resistance surveillance schemes** (mainly the Resapath network and the Vigimyc network for ruminant mycoplasmas). With regard to Resapath, structural changes have been finalised; these fell under Action 14 of Theme 3 of the EcoAntibio 2 plan. One has helped optimise data flows (EDIR project, EcoAntibio) allowing the number of member laboratories to be extended (108 in 2024), while the other has finalised online access (R-Shiny) to these data. In addition, a Bayesian approach was used to model Resapath data in order to characterise changes in the susceptibility of *Escherichia coli* clinical isolates to colistin (COBAYE Project, EcoAntibio). In 2025, Resapath will continue its participation in the national meta-network PROMISE, financed since 2021 under the priority research programme on antimicrobial resistance of the future-oriented investment plan PIA3, which links together all the professional networks addressing antimicrobial resistance in the human, animal and environmental sectors. In particular, as part of this meta-network's "Surveillance" working group, ANSES is coordinating a multi-partner inter-sectoral project to collect French data on antibiotic use and antimicrobial resistance in humans and animals, with the aim of producing an analysis similar to that provided at European level by EFSA, EMA and the ECDC (JIACRA: Joint Interagency Antimicrobial Consumption and Resistance Analysis).

In 2025, long-term monitoring of antimicrobial resistance will also be supplemented by the completion of **specific surveys** in project mode, mainly with the last remaining research funding from the EcoAntibio plan: monitoring of carbapenem resistance (Carbascreen project), intersectoral regional monitoring (Intersection project), monitoring in the fish-farming sector (RéAPoL project), or in veterinary hospital settings (EquiScreen project). More generally, these antimicrobial resistance surveillance data are of great help in assessing the effectiveness of public policies on the use of veterinary antibiotics in France. In this context, ANSES will continue contributing to the implementation of One Health monitoring of antimicrobial resistance, particularly during resumption of work for the FIM and the EcoAntibio 3 plan in 2025.

At European level, on the basis of its expertise in coordinating the Resapath network and in the framework of the **EU-JAMRAI** European joint action (2017–2020), ANSES had taken the lead in the **EARS-Vet** initiative for coordinating European surveillance of antimicrobial resistance in veterinary medicine in Europe, in line with the objectives of FIM Action 39. The Agency continued working towards this ambition in 2024 and will pursue it throughout this joint action. In 2022, the French Presidency of the Council of the European Union (FPEU) reaffirmed the importance of the EARS-Vet scheme. Since 2023, and for a period of four years, the large-scale roll-out of the EARS-Vet network has been on the agenda of the European EU4Health programme, part of **EU-JAMRAI 2**. Lastly, the participation of ANSES's laboratories in the **European Partnership on Animal Health and Welfare** (EUP AH&W) and in the **WISH Joint Action** on wastewater will further enhance the effectiveness of the monitoring of important pathogens and their antimicrobial resistance profiles (Action 4).

Pursuing methodological developments for the detection of antimicrobial resistance

In 2025, the Agency will pursue several actions on **methodological approaches for monitoring antimicrobial resistance**. These actions will capitalise on previous programmes, in particular those developed within the framework of the One Health EJP (IMPART and HARMONY projects). They will include, as necessary, an update to the list of methods for conducting tests to determine bacterial susceptibility to veterinary antibiotics, following the 2019 publication by ANSES of specifications for industrial use.

They will also focus on developing/standardising screening methods for resistance genes (PhaRe project, EcoAntibio 2) or diagnosing and determining susceptibility to antibiotics of more specific bacterial species/genera (DIAMS projects, MyMIC and MYCARESP projects for mycoplasmas of ruminants and domestic carnivores), as well as methods selected due to their clinical or epidemiological importance, the lack of study methods, or their relevance as indicators of antimicrobial resistance in certain environments (*Aeromonas*, *Vibrio*, *Brachyspira, E. coecorum*, etc.) (ARMANI project, EcoAntibio 2). Lastly, the Seq2Diag project, funded under the Priority research programme on antimicrobial resistance and seeking to better predict the phenotypic resistance of bacteria from their genomes, will continue in 2025.

Better characterisation of the resistome and antimicrobial resistance gene flows

In 2025, the laboratories will continue their work on **molecular characterisation of the resistome and of genetic carriers of antimicrobial resistance determinants in different environments**. In this area, the Agency has been involved in several research projects funded by the EcoAntibio 1 and 2 plans (the latter of which came to an end in 2024). Others will continue until 2025, addressing questions of the phylodynamics of resistant clones (Dynasty, SARAA project) or improving understanding of intersectoral transmission of antimicrobial resistance on a regional scale (COMEDIA project). Similarly, the DYASPEO project (2021–2027), funded under the Priority research programme on antimicrobial resistance, seeks to characterise these genetic flows between pets and humans. Interventional approaches to control the flow of antimicrobial resistance will also continue (for example, the ENVIRE project on chickens, funded by the Joint Programming Initiative on Antimicrobial Resistance – JPIAMR).

All these studies enable assumptions to be put forward on the spread of antimicrobial resistance and possibly on source attribution between animals within sectors, between sectors at national level and/or cross-transmission with humans. These interdisciplinary programmes also enable synergies to be developed with many other partners working on the antimicrobial resistance issue (INRAE, Inserm, *Santé Publique France*, *Institut Pasteur*, other institutes in Europe, etc.), as part of an integrated approach. In this respect, the ABRomics project to set up an interoperable One Health multi-omics platform, financed under the Priority research programme on antimicrobial resistance (of which ANSES is a partner), is enabling our laboratories to contribute to the intersectoral (human, animal, environment) analysis of WGS data for antibiotic-resistant bacteria.

Refining our understanding of the links between exposure and impacts

The emergence and spread of antimicrobial resistance results from the exposure of individuals and ecosystems to external factors, mainly but not exclusively antibiotics. The possible role of breeding factors will be studied (Alea Jacta Est project, EcoAntibio 2, DISIRe project, JPIAMR). With regard to antibiotics, the impact of changes in animal exposure (IMPACT-AMR project, EcoAntibio 2) and the role of **co-selection** (ICONIC project, JPIAMR) will be investigated. Cross-linkages with the use of biocides may also be important, and the **impact of disinfectant biocidal treatments** (enzymatic detergents, antimicrobial materials) on microbial ecology and resistance mechanisms to biocides, metals and antibiotics will be analysed. In particular, research on the adaptation of bacterial biofilms to biocides and the consequences on antimicrobial resistance will continue in 2025 as part of an ANSES-INRAE thesis (BioCARe project), an ANR-JCJC project (BAoBAb) and an EcoAntibio project (RESABES). In conjunction with the ANMV's activities, the laboratories will help refine quantification of animal exposure to antibiotics through surveys on use. Work will also be finalised or carried out to assess, through experimental approaches and/or overall molecular analyses (metagenomics, for example), the impact of antibiotic use on the microbiome, on the emergence of cross-resistance mechanisms and on the overall microbial ecology of ecosystems (METARes, STAFILMS, CANIBIOTE, CONTALIM and EMOXIMINT projects). As a follow-up to the ANSES report on alternatives to antibiotics published in April 2018, work on the relevance of credible alternatives (bacteriocins, algal hydrolysates, pre- and probiotics, phage therapy, autogenous vaccines), which had already been widely studied up to 2023 (in projects such as RESPEC, CANIPHAGE, EVASION, EcoAntibio 2), will be pursued as part of the EcoAntibio 3 calls for projects: vaccine solutions against *Mycoplasma bovis* and colibacillosis (Coliovax project, EcoAntibio 2), development of phage therapy against *Pseudomonas aeruginosa* (Pseudophage project), EcoAntibio 2 and 3.

Strengthening cross-cutting links between the Agency's laboratories and assessment departments

The laboratories are developing work on the topic of antimicrobial resistance in conjunction with other specialist ANSES divisions, or in disciplinary fields other than those usually covered. Following the same approach as for the work on the formal request on the risks associated with antimicrobial resistance in environmental media, initiated in 2018 by the Risk Assessment Department, whose conclusions were issued in 2020 and which included a contribution from the ANSES laboratories, a formal request initiated in 2021 on the **analysis of priority antimicrobial resistance risk profiles** (bacteria/resistance phenotype pairs) from the animal sector and of importance for public health was finalised in 2023. Its conclusions fall under Action 7, Theme 1 of the current EcoAntibio 3 plan. More generally, all the interface work carried out over the last few years between laboratories and assessment departments (particularly the Risk Assessment Department and the ANMV) has provided input for the drafting of the EcoAntibio 3 plan. Lastly, 2025 will see the finalisation of a trans-disciplinary doctoral study combining technical expertise from the biological sciences with a reflexive and conceptual contribution from philosophy and the human and social sciences around issues

related to ethical and socio-cultural aspects of the fight against antimicrobial resistance in livestock.

Strengthening the Agency's international position on antimicrobial resistance

In 2025, the Agency will continue its support to the FAO under its **mandate as FAO Reference Centre for antimicrobial resistance**, which was awarded to ANSES in November 2020. The Agency will mobilise all its expertise to contribute to the four themes developed by the FAO in its plan to combat global antimicrobial resistance. For example, the Agency will participate as needed in the drafting of guidance documents on the appropriate use of antibiotics and control of antimicrobial resistance, or may provide support for strengthening the laboratories' analytical capacity. As such, a project awarded under the EcoAntibio plan (REFFAO, EcoAntibio 2) was rolled out in 2023 and 2024 with a view to conducting an inter-laboratory test on antimicrobial resistance in African countries, similar to what is done in the Resapath network, as a pilot project that may possibly be pursued with FAO funding. Under its FAO mandate, ANSES is also involved in setting up the FAO's InFarm database on antibiotic use and antimicrobial resistance. Other measures, including training, will also be discussed in 2025 as part of this mandate, as well as in collaboration with the ENSV-FVI veterinary school (part of VetAgro Sup), and will include sociological aspects. ANSES's partnership with the Mérieux Foundation further strengthens this international positioning on antimicrobial resistance.

7. Laboratory activities for the epidemiology and surveillance theme

The ANSES units working in epidemiology:

- provide scientific and technical support to ANSES's supervisory ministries, partner organisations and risk assessment departments, in particular on Category A,D,E/B,D,E diseases under the European Animal Health Law;
- jointly coordinate several surveillance schemes (Resapath, Vigimyc, *Salmonella*, RNOEA Observatory, Resumeq, Foot-and-mouth disease rapid-response unit);
- provide support to the Agency's NRLs, enabling them to carry out their tasks of collecting, processing, facilitating access to, transmitting and disseminating epidemiological surveillance data (Order No 2015-1242 of 7 October 2015 on the organisation of surveillance concerning animal health, plant health and food safety);
- are involved in the three national epidemiological surveillance platforms (animal health, plant health and food-chain safety) in the steering committees, working groups and, depending on the case, coordination teams and operational teams;
- make a significant contribution to the production of articles for the *Bulletin Epidémiologique* on Animal Health & Food Safety published jointly by ANSES and the DGAL, in particular the annual health reviews on the surveillance of regulated diseases in animal health, and the monitoring and control plans for food-chain safety;
- conduct their own research activities.

In some cases (e.g. the SUM'EAU system for monitoring wastewater), these same close interactions are found between epidemiologists at *Santé Publique France* and ANSES's NRLs, thus benefiting surveillance.

In addition to surveillance, which is an ongoing activity, the epidemiologists at ANSES study the spread of zoonotic diseases or agents and other hazards in populations and ecosystems. The work is designed to both predict this spread and measure the impact of management measures.

In 2025 and 2026, they will again offer major scientific and technical support and carry out key research on Category A,D,E/B,D,E animal diseases, in particular avian influenza and tuberculosis. The epidemiology of other diseases such as Lyme borreliosis and enzootic bovine leucosis will also be developed. In addition to this vital groundwork, other key work for 2025 and 2026 will focus on environmental epidemiology, epidemiology of antimicrobial resistance and methodological innovation.

Epidemiology of avian influenza

On the issue of HPAI, which is still very topical, the vaccination and One Health aspects will be explored in greater detail. A study will analyse the impact of introducing vaccination on the epidemiology of HPAI and the understanding of the factors associated with effective vaccination in poultry populations. At the same time, multi-scale modelling of the spread of HPAI in a vaccinated setting will be used to assess the effectiveness of vaccination and its variability according to the different vaccination protocols, while taking account of the logistical constraints of farms, their geographical location, changes in infectious pressure in the environment and farmers' practices.

From a One Health perspective, the emergence of zoonotic HPAI viruses will be analysed at the interface between wildlife, domestic animals and humans. Taking molecular, ecological, social, environmental and epidemiological factors into account, the aim will be to identify the mechanisms underlying the emergence of these viruses and the crossing of the species barrier. In another project exploring the link between the microbial exposome and health risks, the benefits of One Health management of issues related to zoonotic influenza viruses will be analysed.

Lastly, in connection with climate change and the upheaval caused to migratory bird populations, one component of an EFSA-funded project will propose active surveillance for HPAI viruses circulating in wild birds in the Camargue during the winter season. The aim is to increase the effectiveness of avian influenza virus detection and contribute standardised results to the European surveillance network.

Epidemiology of tuberculosis

The biosecurity measures implemented on French cattle farms to combat tuberculosis will be assessed, taking technical, economic and sociological aspects into account. In addition, thanks to a project modelling the intra-host dynamics of markers of *Mycobacterium bovis* infection in badgers, it will be possible to interpret the various immunological marker profiles as being specific to infection or vaccination.

Epidemiology of other major infectious diseases

Many other infectious diseases will be analysed and modelled, but more specifically Lyme borreliosis (LB) and enzootic bovine leucosis.

A thesis will characterise geographical variations in the risk of exposure to LB among horses in France. A spatial multi-criteria assessment will map the risk and then be used to develop a tool for classifying clinical suspicions of equine LB, in order to determine the risk of clinical manifestations of this disease.

Another project will focus on the evolution dynamics in a herd infected with enzootic bovine leucosis and on modelling the control strategies considered for Reunion Island.

Environmental epidemiology

In a One Health approach, it is important to characterise not only the influence of the environment on animal health, but also the animals' influence on environmental contamination.

In the environment-to-animals direction, the effect of exposure to electromagnetic and electrical waves on cattle mortality will be studied, as well as the hydro-ecological conditions for the appearance of botulism in ponds (considering the changes brought about by climate disruption).

In the animals-to-environment direction, one study will explore the contamination of fresh produce and berries by *Echinococcus* spp. and *Toxoplasma gondii*, while another will focus on detecting pathogens in air and assessing their spread in aerosols.

Epidemiology of antimicrobial resistance

In the field of epidemiology of antimicrobial resistance, studies will continue according to a One Health approach on the dynamics of resistant bacteria and/or resistance genes between animal and human populations, using statistical and modelling approaches. The impact of management measures on the transmission of antimicrobial resistance will also be investigated.

Lastly, the spread and transmission of methicillin-resistant *Staphylococcus aureus* within the pig sector (between farms and at the abattoir) will be modelled, taking exchanges with humans into account (direct or indirect contact, food).

Methodological innovation

Alongside studies targeting the understanding of a disease or pathogen, it is important to develop new epidemiological and modelling tools and methods, in order to better explore population health. To this end, the Nowcasting project will use very short-term analytical forecasting methods to better estimate the actual incidence of disease in affected areas. The results will help improve the accuracy of qualitative and quantitative assessments of the risk of disease introduction or spread. Moreover, the use of deep learning approaches to detect health events and map risks will continue. Lastly, Bayesian methods will be developed to analyse the numerical results of multiple diagnostic tests (application to infectious bovine rhinotracheitis and bovine viral diarrhoea).

8. Laboratory activities for the exposure to and toxicology of chemical contaminants theme

Exposure to chemicals and their impact on public health and the environment are major issues for sustainable development. A sustainable chemicals strategy requires early identification of hazardous substances based on the continuous improvement of methods for assessing hazards, exposure and risks, as well as the implementation of rapid-alert systems based on monitoring and control. It must take account of the development of a circular economy and the potential risks of recycling. The information generated contributes to our understanding of the chemical component of the exposome. Methods are constantly evolving to address the challenges posed by the growing number of chemicals affecting human health, ecosystems and animal health.

By coordinating the European PARC initiative, the Agency brings together an extensive network of research institutes, public health and environmental agencies, and monitoring laboratories.

The "Exposure to and toxicology of chemical contaminants" strategic theme aims to harmonise the Agency's skills according to a comprehensive One Health approach.

More specifically, the laboratories are contributing to this theme through:

- monitoring and control of residues of veterinary medicinal products, plant protection products, disinfectant biocides, trace metal elements and toxins (phyco-, bacterio- and biogenic amines) in foodstuffs of animal origin;
- monitoring and control of chemicals in water;
- development of analytical tools for monitoring microplastics;
- characterisation of hazards to the health of humans and animals (bees, fish);
- development of new methodological approaches;
- characterisation of exposure to several classes of substances as part of the third total diet study (TDS3), coordinated by the Agency (Risk Assessment Department) and the study of dietary exposure to chlordecone in the French Caribbean population;
- study of the fate of these substances in the context of new agri-food industry processes (recycling, cleaning, etc.);
- study of the fate of these substances in the environment, food, humans and animals.

Major health issues identified, studied and pre-empted

Several reference mandates for chemical contaminants of anthropogenic (**veterinary drugs, plant protection products**), natural (**marine biotoxins, histamine**) or combined (**trace metal elements**) origin in food, hive products and water have been entrusted to the Agency's laboratories, which will therefore continue to develop and validate analytical methods, contribute to standardisation, organise inter-laboratory tests and coordinate laboratory networks under quality assurance.

With regard to **veterinary drug residues**, the implementation of Regulation (EU) 2021/808 is leading to a review of all analytical methods. New methods for substances covered by regulations on both **plant protection products** and **veterinary medicinal products** will be

validated according to common protocols. Methods for detecting residues of **banned antibiotics** using various biochemical tests will be assessed, and electrochemical methods will be developed and validated. For **marine biotoxins**, accreditation of the effect-directed physico-chemical analysis method (Neuro-2A cell-based assay) will be sought.

Analytical methods will continue to be developed for **per- and polyfluoroalkylated substances** (PFAS) in food (fish and dairy products) and water (using various targeted, indexed and non-targeted approaches). In water, national campaigns focusing on these substances (including short-chain PFAS) will be finalised. Development work is continuing to measure **cyanotoxins** in recreational water and demonstrate proof of concept for using non-targeted approaches to improve knowledge on the presence of chemical contaminants in matrices, with high-resolution mass spectrometry (HRMS).

Technological and methodological innovations currently being integrated

As part of their cross-functional work, the laboratories will collaborate on several national and European projects, some of which are being co-funded by the European PARC initiative. They will focus on the use of **high-resolution mass spectrometry** for developing broad-spectrum analysis protocols with regard to the substances screened for (multiple classes) and signal processing to screen for known (post-target analysis of suspect substances) or unknown (non-targeted analysis) substances, along with the creation of virtual sample libraries. The units will also collaborate on effect-directed analytical approaches. Development of biosensor-based tools will also continue in order to detect disinfectant biocides from the quaternary ammonium and chlorate classes in the agri-food industry.

With the establishment of the proteomics and metabolomics platform (Prométhée), multi-omics data analysis approaches will be developed to more effectively study intracellular responses and characterise adverse response pathways at different levels of organisation (cells, organoids, tissues).

Providing knowledge useful for characterising hazards

To help characterise hazards for humans, several national and European research projects will continue with a view to extrapolating bioaccessibility, absorption, distribution, metabolism and excretion processes from *in vitro* to *in vivo*. The toxic potential of different classes of substances or materials (**toxins, nanomaterials, plastic particles, plastic additives, pesticides**) will be characterised according to different modes of action (cellular toxicity, genotoxicity, endocrine disruption, amyloid protein impairment, inflammatory responses). Some of this work will contribute to method harmonisation and validation, data sharing and the development of integrated testing and risk assessment methods. The effects of **pesticides** on amyloid protein impairment mechanisms, or the effect of **microplastics** and **quaternary ammonium** on chronic inflammatory bowel diseases, will be studied with the help of dedicated animal models.

In animal health, work on the immunotoxicity of **sodium fluoride** to fish will be finalised. Combined effects of chemical and microbiological contaminants will continue to be studied in fish.

Collaborative development of a computer platform incorporating kinetic and dynamic models for animal health will be pursued.

Aiming for better knowledge of exposure

In order to provide updated data on the levels of exposure of the French population to substances alone or in mixtures (biocides, pesticides, trace metal elements), several units of the ANSES laboratories will continue working with the Risk Assessment Department as part of the third total diet study (**TDS3**). The units are taking part in projects contributing to a better understanding of contamination levels in foodstuffs for integrated risk assessment approaches.

Collaboration with **France Exposome** to establish a molecular map of the human chemical exposome is planned.

Helping to understand the fate of chemical contaminants

The laboratories will contribute to research into the contamination of various environments by chemicals (**disinfection by-products, pesticides and their metabolites, PFASs, disinfectant biocides, trace metal elements**) and microplastics, and the study of their effects.

As part of the adaptation to climate change and technological developments (remediation, recycling, reuse of co-products), the teams will be involved in various projects focusing on the fate of chemical contaminants during agri-food and water treatment processes, and more broadly the possible transfer mechanisms between different environmental compartments.

Lastly, several projects will examine the influence of cooking on contaminants in food.

Science for Expertise Division

In line with the strategic orientations of the 2025 work programme on the one hand, and implementation of the **2023–2027 goals and performance contract** (COP) on the other, the work programme of the Science for Expertise Division is based on the set of work sheets drafted by its entities (drawing on cross-functional links within the Agency), in conjunction with its supervisory ministries and external partners, and with input from stakeholders. This summary sets out the teams' commitment to safeguarding health. Without being exhaustive, it gives some perspective to major actions that help increase the efficiency and scientific robustness of ANSES's work, advance major projects in the various specialist areas, prepare and support developments in response to health and societal challenges, enhance institutional communication on the Agency's role, challenges and utility, and integrate its work at the European and international level. The choices here have been made for their illustrative nature, as the division's activities flow from the entire work programme. In addition, for the communication and international parts, they concern the division's contribution to ANSES's overall work in these areas.

1. Increasing the robustness of our work, using holistic approaches and improving efficiency

These challenges mainly correspond to two themes of the new COP: Theme 5, entitled "Transparent, efficiency-oriented action", which is largely supported by the division's work; and Theme 1, whose wording is resolutely geared towards **new, more holistic approaches** and developing the scope of the missions. There is obviously a constant imperative to **ensure the robustness of the expert appraisal and vigilance processes** – which are now governed by fundamental principles published in early 2024[18] – as a necessary condition for the credibility of the Agency's work. As part of an ongoing process, incorporating the action plan following on from the recommendations of the Scientific Board and the Committee for Ethical Standards & Prevention of Conflicts of Interest, the revision of two older documents – the Fundamental principles of collective expert appraisal and the Guidelines – will be undertaken in 2025.

In order to mobilise new expert appraisal approaches in the future, it is important to work today on research to develop and validate them. The involvement of the Risk Assessment Department (DER) and the Social Sciences, Economics & Society Department (DiSSES) covers a broad portfolio of research activities, such as the European Partnership for the Assessment

[18] The fundamental principles underlying ANSES's vigilance schemes (in French)

of Risks from Chemicals (PARC), in which the DER's role has been outlined (Sheet 5.7.2); **2025 will be an opportunity to gain some perspective on** PARC's contributions to ANSES's missions and work (milestone in Goal 4.1). The finalisation of a White Paper for a national research strategy on occupational health and the mapping of occupational health research players (Sheet 4.1.1) is also expected by early 2025, in response to a goal of the COP (milestone in Goal 1.2).

The new research debate and planning framework provided by **the programme agencies set up under the leadership of the French Ministry of Research** is an opportunity to mobilise ANSES's scientific work in a new way. For example, with the "Health" programme agency, on the basis of the previous Scientific Board's work and recommendations on the exposome, the division **is working with Inserm to set up a research programme, PEPR PreVIome, to improve prevention** from the earliest stages of life **through better knowledge of the exposome** and the development of innovative approaches (Sheet 5.8.1). This programme, which brings together a number of French partners, will be submitted to the Ministry of Research in 2025.

With regard to the integration of socio-economic analysis, aided by its different tools and disciplinary components, one of the DiSSES's work programme sheets (Sheet 7.1) lists the deliverables of the expert appraisals in progress, or due to be launched in 2025. It includes just under 20 expert appraisals, in response to both formal requests and internal requests. The division is determinedly pursuing the roll-out of its **roadmap (Sheet 7.3) for the development and deployment of methodological work** to be carried out in socio-economic analysis, in response to the corresponding COP goal (within Goal 1.1). This roadmap includes the testing of existing reference systems (i.e. those used for determining the scope of a socio-economic analysis, assessing the health burden, analysing action options, analysing controversies) and the development of new ones (for analysing socio-economic determinants, production sectors, alternatives, environmental burden). In addition to these reference systems, the DiSSES is conducting another methodological debate on socio-economic analysis, in particular on cost-benefit analysis in the context of a health agency's missions. This is taking place with the **active support of ANSES's international Scientific Board**. It should be noted, however, that the amount for studies in support of socio-economic analysis will be limited, and will be included in an overall budget for studies in all the areas to be covered.

As another demonstration of a more holistic approach to risks, the expert appraisals that will apply the recommendations of the Exposome WG (Sheet 5.8.1) and **integrate "One Health" and "Exposome" components into their expert appraisal approach, or help address health issues associated with fundamental changes in the environment and society, have been identified under the corresponding COP goal** (Theme 1.3). By way of illustration, the corresponding indicator for 2023 amounted to a total of 24 formal requests and internal requests: respectively four on the "One Health" approach, three on the "Exposome" approach and 17 on the contribution to the issues associated with changes in the environment and society.

At the crossroads of issues relating to socio-economics and the "One Health" approach – as well as the environmental exposome – the Agency has just initiated an **internal request on pollination services**. The work will be led by the DiSSES with support from the DER and the Sophia-Antipolis Laboratory for bee health. Its aim is to map the issues in consultation with stakeholders. Characterising the vulnerability of a region will take into account firstly the ability

of pollinators to provide their service to the ecosystem, and secondly the demand for this pollination service from a variety of stakeholders. The work began in autumn 2024 and is scheduled to continue for 24 months (Sheet 7.1).

The testing and support phase of the ACCMER WG's work will enter its second year of operational implementation in 2025. This **is implementing the recommendations of the Agency's Scientific Board on taking the weight of evidence and uncertainty into account** (Sheet 5.8.2), by balancing them against the operational constraints of formal requests (availability and variety of data, timetables for expert appraisal contracts, etc.). The tools have been integrated into the reference system and procedures for the "Producing health-related expert appraisal" quality process.

Methodological work on vigilance will also be conducted, with two particular points worth mentioning. The first is the **finalisation and validation of the method for determining causality used by the poison control centres** when studying cases of exposure recorded in their information system (SICAP) (Sheet 8.2.5). **This will be reported in a scientific journal article in 2025**. Consistency and reproducibility in the analysis of cases is a key factor determining robust exploitation of data collected by the poison control centres and communicated in their thematic toxicovigilance reports. The second point, responding to a third formal request from the Directorate General for Labour, is the continuation of the cycle for updating the occupational exposure thesaurus (TEP) (Sheet 8.1.2). This thesaurus is used to share events of interest (particularly those recorded by the RNV3P network) among all occupational health stakeholders, according to a common, harmonised language. Since 2024, the TEP has been hosted by the French eHealth Agency (ANS), on a server that enables the secure and widespread publication of reference terminologies for the healthcare and medico-social sectors.

Lastly, regarding the **ranking of hazards and risks to food safety**, ANSES is continuing its activities under PrioR (Sheet 1.8.6). Work on the cattle sector should be completed in the first half of 2025, allowing work to begin on a new sector (to be defined). Moreover, in accordance with the key recommendations of the Exposome WG, database creation also needs to be accompanied by the provision of easy access to the data generated. More specifically, following the work begun in 2023 on the plant sectors in connection with the **formal request on the risk rating for scheduling official controls in the field of foodstuffs of plant origin** (Sheet 1.3.11), and the submission of an interim note on five activity units in autumn 2024, efforts will continue throughout 2025 to address the additional activity units. This formal request is in line with the implementation of a single body to enforce health policy under the aegis of the DGAL.

In terms of the **efficiency and management of expert appraisal work**, the COP goals are achieved through the contribution of opinions and reports finalised during the year, which are then reflected in aggregate indicators. One example is meeting contractual deadlines for formal requests (indicators in § 5.3 of the COP). In 2024, a specific working group involving both ANSES and its supervisory bodies, the **WG on Formal Requests**, met to identify the specific points requiring attention from both the commissioning ministries and the expert appraisal units. After discussing the constraints specific to each party, the best practices that

emerge will be explained and prioritised. At the heart of these will be a **close dialogue** at various levels (operational and management) to identify the best possible solutions when difficulties are encountered, particularly when a response is needed in a short space of time. This is the logic behind the new provisions of the emergency expert appraisal protocol, which was implemented on various occasions in 2024.

As part of the continuous improvement process, **a debate will be held on "customer" satisfaction with the vigilance activities carried out for 2024–2025**, initially involving ANSES's supervisory ministries. To ensure neutrality, this task has been entrusted to an external company. It is hoped that a subsequent debate will be undertaken with healthcare professionals, who play an essential role as both information providers and users of the findings of this work, subject to the resources being available. A report will be issued at the end of these two phases, which will be led by the internal Vigilance Scheme Coordination Committee set up under the previous COP.

After a major upgrade to the technical equipment in the meeting rooms in 2023 and 2024, and an increase in the experts' remuneration for their activities on ANSES's behalf (fees and travel expenses), ANSES will **conduct a review in 2025 (COP milestone) of all the actions carried out under the goal in § 5.3 on maintaining and renewing its pool of mobilised experts**.

The response to the 2024 milestone of the goal in § 1.3, on developing proposals to improve the responsiveness and relevance of the mechanism for developing health guidance values for managing drinking water resources (currently the Vmax values) (see Sheet 1.3.7), will give rise to discussions with the players involved in its implementation, including at international level (WHO, EFSA, UBA in Germany, etc.). The Agency points out that, without waiting for this milestone's deliverable, it supported the High Council for Public Health (HCSP) in designing and implementing a dedicated responsive scheme, Sec'Eau, under the HCSP's Environmental Health Commission. The task of this HCSP working group is to provide provisional benchmarks to meet management needs until ANSES's collective scientific expert appraisal develops values that fully meet the requirements of health reference values. On this same topic, the Agency has also been contributing to the establishment of a WHO expert group (WHO initiative to evaluate pesticide metabolites in drinking water), whose work began in June 2024 with the aim of drawing up a WHO guide by 2025. The investment in international studies will be re-assessed.

Lastly, regarding the governance and strategy for data explained in response to a specific goal of ANSES's COP (§ 1.4), the division will contribute to the implementation of this strategy, which addresses the data generated by the Agency's activities (in connection with its platforms, observatories and studies), the need to access data for expert appraisals, data mining as part of its vigilance work and the contribution of generative artificial intelligence to these various aspects. Particularly significant is the work carried out to prepare a permanent solution for the Green Data for Health (GD4H) scheme initiated under the PNSE4 and supported by the Ministry of Ecology's General Commission for Sustainable Development (CGDD). ANSES has offered to take charge of this scheme and the conditions for this will be finalised with a view to implementing it in 2025: the hosting agreement will be signed in early April 2025. The division also remains active in EFSA's Advisory Group on Data (AGoD), in

particular to accelerate and facilitate their collection as part of the national reporting of monitoring data in different food matrices. Various European activities of collective interest proposed by ANSES have been supported (see Sheet 1.9.3).

2. Initiating or completing major projects

In its first theme (§ 1.2), the 2023–2027 COP emphasises ANSES's role in advancing the knowledge needed to assess health risks. For the division, besides the assessment methodology aspects mentioned previously, this relates to the **funding and guiding of research in order to provide input for future expert appraisals**. In light of the high expectations for environmental health research expressed in the PNSE4 and the goals of the COP, in 2023 the Agency had presented its supervisory ministries with **a well-argued proposal to reorganise the PNR EST** and stress its importance to the Ministry of Research (see Sheet 9.3). However, there was no clear response to this proposal in 2024, against a backdrop of major budgetary uncertainties and the Ministry of Research's priority of establishing programme agencies in five major areas, clearly replacing the existing alliances (AllEnvi, AVIESAN, etc.).

Given the expected severe budgetary constraints, 2025 is unlikely to see a strengthening of the PNR EST. The reduction in funding will have a direct impact on the number of research projects financed and therefore on the selection rate, especially at a time when once again, large numbers of researchers are submitting proposals. To address this issue and maintain an acceptable selection rate, the preferred approach is to fund the 2025 PNR EST call for proposals over two budget years, 2025 and 2026. This will result in a shift in the timetable for the 2026 calls, or even a year in which no calls are issued.

However, ANSES is continuing to work with the Ministry of Research and is extending its cooperation with the ANR, which also involves four other funding bodies (ADEME, Inserm, ANRS-MIE and InCA). Following the **opening of the joint portal "appelsprojetsrecherche.fr"**, which fulfils the Ministry of Research's commitments to the research community, the coming year will be an opportunity to work on the next stages of the simplification project for researchers: researchers' space, collaborative spaces for compiling applications, use of unique identifiers. Together with the ANR, ANSES is co-leading **the deployment of IRIS, the new platform for submitting and assessing responses to calls for proposals**. **This will be used by ANSES in its 2025 calls,** and the ANR will also propose it to the other portal partners.

However, this work should not overshadow **the Agency's concerns about taking account of the "research recommendations"** that are an integral part of the health-related expert appraisal process it implements in response to formal requests. The reduction in the budget available for funding the PNR EST and the allocation of significant resources to the new programme agencies all explain why research teams are directing their proposals and project submissions to other sources of funding, which do not have the same priorities regarding expert appraisal research subjects.

Accordingly, **in 2025, as soon as they have been finalised and formalised, ANSES will share the**

results of the PNR EST self-assessment, which began in 2023. It will also consider how to ensure that these same recommendations are taken into account in other research funding and planning mechanisms. If this is not the case, some of its work, such as the White Paper for a national research strategy on occupational health, which is also due to be completed in 2024–2025, may not see its recommendations implemented in practice.

On this fundamental topic, in addition to mobilising the Agency at the highest level to achieve the strategic objective of reorganising the PNR EST, an equivalent mobilisation by the supervisory ministries is absolutely essential.

As part of the goals of the 2023–2027 COP (Themes 1.2 and 1.3), the division has **taken on two new tasks entrusted to ANSES: the Indoor Environment Quality Observatory (OQEI)**, run jointly with the French Scientific and Technical Centre for Building (CSTB), and **vigilance and assessment missions relating to cosmetics and tattoo products**. The first was officially launched in June 2024, while transfer of the second took effect on 1 January 2024. The work sheets for both the DER and the Health Alerts & Vigilance Department (DAVS) (Sheets 3.5.1, 5.2.11 and 8.2.9) give an account of the work that has now been initiated. The scope and ambition of the OQEI's work in 2025 has been revised downwards in view of the resources available, while the bodies (scientific board, partners' committee) are still being set up. The scheme's long-term sustainability will be examined.

Concerning the organisation of our schemes, and our vigilance activities, the division also announced the integration of the new regional occupational and environmental disease centres (CRPPEs) in the French Caribbean and Reunion Island into the National Network for Monitoring and Prevention of Occupational and Environmental Diseases (RNV3P), while the French Guiana and Martinique toxicovigilance schemes (DTVs) will be integrated into the toxicovigilance network.

The coming year will be marked by **three key stages in three major studies conducted by ANSES**, alone or jointly with other partners.

For **the Albane survey** (Sheet 1.8.3), which results from combining the INCA3 and ESTEBAN studies, previously conducted separately by ANSES and *Santé Publique France*, respectively, the lessons learned following the pilot study will be applied in early 2025 for the launch of the first full-scale roll-out. This will be subject to validation of the survey protocol's feasibility and acceptability, and the obtaining of additional authorisations from the French Data Protection Authority (CNIL). The second half of 2025 will be spent monitoring fieldwork for the full-scale survey with the support of the service providers (setting up monitoring tools, making logistical adjustments, maintaining the tools, etc.), and preparing to process the first data collected.

For the **third total diet survey (TDS3)**, 2025 will be an opportunity to finalise the **analyses of the matrices** already sampled (Sheet 1.8.1) under the supervision of the DER's Methods and Observatories team, and begin assessing exposure with a view to progressively releasing the results over several years, starting in the first half of 2025. Toxicology work (Data-tox, Sheet 1.3.8) in preparation for assessments is also progressing, although it represents a significant investment (around 150 substances to be processed).

For the **Pesti'Riv** study (Sheet 5.7.1), also conducted jointly with *Santé Publique France*, the results will be analysed and interpreted in 2025 **in order to draw joint conclusions and recommendations**, which will be prepared by two expert groups, within ANSES and SpF, respectively. A specific debate will be held, in conjunction with the chairs of the SpF and ANSES dialogue bodies, to determine the best possible conditions for sharing and reporting this joint work, which is attracting a great deal of attention from stakeholders.

Another of ANSES's major projects is its contribution to national thematic plans, some of which are being renewed: in environmental health with the PNSE 4 "My environment, my health", and in occupational health with the National Occupational Health Plan (PST 4). The coming year will also see key stages in the following plans: the next step in the National Endocrine Disruptor Strategy, following an assessment of the SNPE2; the preparation of the Fifth National Nutrition and Health Programme (PNNS); and the interim assessment of the ten-year cancer prevention strategy. A specific annex to the 2025 work programme identifies the contributing activities.

Furthermore, the following major projects should be started, continued or completed, depending on the case, when implementing the 2025 work programme:

- Finalisation of two important and long-awaited expert appraisals on information and communication technologies: firstly, an update of knowledge on the links between exposure to radiofrequencies and cancer risk, for which the draft report was submitted for public consultation in autumn 2024 (Sheet 5.1.4); and secondly, the expert appraisal on the assessment of other categories of effects due to these technologies on children and adolescents (Sheet 5.1.5);
- As part of ANSES's mission on tobacco and vaping products, finalisation of the expert appraisal in response to the internal request on the assessment of the risks associated with the use of related tobacco products, particularly vaping products (Sheet 3.2.1);
- Second and final stage of the expert appraisal on raw milk cheeses, mainly addressing the analytical methods, the performance of sampling for risk analysis, and research proposals for improving risk control (Sheet 1.4.4);
- Publication of the results of the expert appraisal to improve the citizen surveillance scheme for *Aedes albopictus* and mosquito vectors in general, which will contribute to COP Goal 2.1 on improving the detection of emerging threats;
- Continuation of the expert appraisal responding to the formal request from all the supervisory ministries, on the risks associated with **exposure to substances in the PFAS class** (Sheet 1.3.9). After supporting the restriction project seeking to limit non-essential uses, as part of a European process led by ECHA, the DER is continuing work to identify and provide information enabling the public authorities to undertake measurements in the various environmental compartments and food matrices (water and food). Responding to this formal request is having a significant impact on certain long-term missions, such as the production of reference values. This work is now part of a dedicated interministerial plan, to which the Agency is contributing through various

actions. Together with EFSA, ANSES is coordinating a multi-agency initiative to speed up sharing of the available scientific data;

- In terms of vigilance, the launch of a toxicovigilance analysis of cases of exposure to different classes of chemical drain unblockers (Sheet 8.2.7) and, with a view to European reporting, the five-yearly review of cases relating to the use of biocides (Sheet 8.2.8);
- Lastly, in the field of occupational health, 2025 should see the completion of the second part of the long-term expert appraisal of atypical working hours (Sheet 4.2.1).

3. Implementing the necessary changes to address new health or societal challenges

The division helps coordinate ANSES's actions with stakeholders under the impetus of the DiSSES (Sheet 7.2). Activities promoting openness to society will continue in 2025, including coordination of the dialogue bodies and the expansion of participatory research. This work falls within the scope of Theme 5 of the 2023–2027 COP "Transparent, efficiency-oriented action" and especially concerns the milestones relating to high-quality dialogue with stakeholders. In particular, **under the 2025 programme, this will include the preparation of a review of citizen science initiatives (COP milestone)**. This will be an opportunity for the Agency to showcase the initiatives resulting from the meetings it organised in 2024 between research teams and members of its dialogue bodies. The constraint on the amount that the Agency can commit to studies will prevent it from providing seed-funding for projects.

Preventing risks and limiting their consequences is part of the very essence of its expert appraisals and the risk assessments that underpin them. The Agency notes that in public health policies, the role of healthcare – and therefore the resources allocated to it – is predominant. Yet the healthcare system is reaching saturation point and will require ever more resources unless the paradigm is changed. **In line with a growing desire for prevention, ANSES considers that environmental health prevention should become an area of investment in its own right**, in order to reduce the burden on the healthcare system. The exploitation of data, and in particular **the cross-referencing of environmental data and health data**, is one way of achieving this. The division will therefore be working on various initiatives to develop practical illustrations of this conviction: through research by contributing to the **PreVIom exploratory research project** (already mentioned in § 1); through **expert appraisal and socio-economic assessment** by identifying complementary partners, such as the **National Health Insurance Fund (CNAM) and the Directorate for Research, Studies, Evaluation and Statistics (DREES)**; through the structuring of environmental data by strengthening its contribution to GD4H in its role as coordination body; and lastly by **joining the Public Health Research Institute (IreSP)** to help structure scientific work contributing to the validation of public health interventions.

For the Agency, assisting with change also means providing support for changes in the organisation of government action. Support for the deployment of the single body to enforce health policy for food under the aegis of the DGAL is being continued through various measures: the extension to all activity units of the expert appraisal on optimisation of official

controls in the plant sector (Sheet 1.3.11). In connection with the issue of data strategy and the overhaul of the corresponding information systems, this introduction of the single body to enforce health policy should also lead to a review of the scope of ANSES's reporting of monitoring data (see Sheet 1.8.3) to EFSA on France's behalf. The options for extending the scope are particularly limited.

To meet societal challenges, the division conducts work on cross-cutting issues that underlie societal transformation: circular economy and changes in consumption patterns, climate change and biodiversity loss, consideration through the exposome of multiple exposure sources and substances, and changes in society's attitudes to animal welfare.

With regard to *climate change*, a growing number of new or ongoing formal requests concern the observed or expected consequences of climate change, with a view to promoting mitigation wherever possible or organising adaptation. These diverse projects are listed in the table below. They include the second phase of the work on **the risks associated with the particles deposited by vegetation fires** (Sheet 5.1.1); work on the **categorisation – in terms of plant health – of eight species of exotic insects following their discovery in France** (Sheet 6.1.4); and, with a view to the forthcoming milestones for the regulation on energy consumption in new buildings (RE2020), an analysis of the **thresholds established under the RE2020 in order to determine their health consequences in terms of summer comfort** (Sheet 4.2.5). Besides work on the formal requests themselves, as part of the Agency's in-house "climate change" project team, a specific section of its expert appraisal work plans and organises methodological discussions on the need to adapt risk assessment to these new objectives.

Table of work programme sheets in support of climate change adaptation or mitigation

Title	Sheet	Type	Area	2025 status
Marine biotoxins and cyanotoxins	1.3.5	Participation in the EMERGTOX vigilance network, formal requests, studies	EH, FS	EMERGTOX and study project (anatoxin-a)
Microbiological hazard data sheets	1.4.3	Internal requests concerning production/updating of sheets	FS	New sheet in preparation (*Clostridioides difficile*)
Assessment of biological risks in foods	1.4.5	Formal requests, internal requests	FS, AHW, 1H	Finalisation of the expert appraisal on the risks associated with the emergence of tick-borne encephalitis (TBE)
Sustainable food guidelines	1.7.5	Draft formal request or internal request to support PNNS5 debates	FS, 1H	Preparatory debates

Title	Sheet	Type	Area	2025 status
Research projects on data and models in food risk assessment	1.10.3	**SafeFood4ClimDiet** project, funded by the ANR. Identification of new dietary habits adopted by consumers in response to climate change. Examination of practices with regard to microbiological risks.	FS	Research projects initiated
Recommendations for physical activity in hot weather	3.1.3	Draft internal request	FS/ nutrition	Debate and framework of the internal request
Vector control	3.3.1 to 3.3.3	Formal requests and studies	1H, EH, OH	Expertise on SIT/IIT (sterile insects), expert appraisal on surveillance
Health risks associated with swimming pools	3.4.3	Formal request (particularly on the frequency of water replacement in pools)	EH	Work started after suspension
Health risks and water unfit for human consumption	3.4.5	Requests to use treated wastewater under existing legislation or for uses not currently covered	EH	According to formal requests received (no requests in progress in autumn 2024)
Internal request on the health risks to drinking water production that may be associated with climate change	3.4.6	Internal request	EH	Continuation of preparatory debates, work not started due to saturation of expert appraisal capacity
With a view to the next RE2020 milestones, analysis of the thresholds established with regard to health consequences	4.2.2	Formal request	EH (OH)	Expert appraisal procedure
Vegetation fires	5.1.1	Formal request	EH, OH	Second part
Cosmetics: support for European work on sunscreen products	5.2.11	Formal request and support for European work	EH	Support for European work
Seafood products: health, nutritional and environmental issues	5.4.2		FS	Preparatory debate
Marine Strategy Framework Directive	5.6.2	Studies and support for implementation of the MSFD	EH	Work to provide indicators for Descriptor 9

Title	Sheet	Type	Area	2025 status
Multi-criteria approaches	5.8.5	Studies in support of Sheet 1.7.5 (see above)	FS, 1H	Food optimisation model with respect to multiple constraints
Categorisation of exotic insects following their discovery in France	6.1.1	Formal requests	PH	Continuation of work to address species not yet examined in 2024

The formal requests relating to **vector control** (resulting from Sheets 3.3.1 to 3.3.3) are of course an integral part of the actions that ANSES has included in its work on adapting to climate change.

As part of a preparatory and forward-looking approach, the Agency's 2025 work programme also includes several sheets exploring how to integrate information on the environmental footprint associated with the production of foodstuffs into the establishment of dietary guidelines. It mainly concerns the following sheets: 1.7.5, 1.9.2, 5.8.5 and 1.10.3. Historically, the dietary guidelines primarily aimed to ensure that nutritional needs were met (nutrients, vitamins and minerals). Then, in its work published in 2016 (contribution to the PNNS guidelines), ANSES added a constraint resulting from the risks associated with food contamination. With a view to preparing the fifth PNNS, at a time when discussions are being held on finalising the National Food Nutrition and Climate Strategy (SNANC), and above all when the international scientific community is mobilised – following in particular the EAT-Lancet Commission (2019), which has launched its second wave of work (EAT 2.0), due to be completed in 2025 – it seems essential for the division, committed through its general management to providing responses to climate challenges, to carry out this work by combining different approaches (research, work on data and reference systems, preparation of expert appraisals). This work is also an opportunity to identify international reference partners to give it the necessary coherence and robustness.

In terms of *responding to changes in consumer expectations and behaviour* and with regard to consumer goods, more time is needed for the expert appraisal on the **risks associated with vaping products** (Sheet 3.2.1), which should be finalised and published in 2025. In the area of food and nutrition, 2025 will in particular see an analysis of the different collective catering schemes (for schools, prisons and crèches 1.7.2, 1.7.3, 1.7.4). In contrast to collective catering practices, the work on taking home-grown food consumption practices into account in risk assessments will also reach a new stage in 2025 (Sheet 1.10.2). Meanwhile, work in the field of vigilance will focus on societal changes, with the launch of a toxicovigilance study on increasingly widespread "do-it-yourself" practices and, in a completely different area, on exposure to products used in drug-facilitated crime (Sheet 8.2.5). At the intersection of societal and climate issues, it is also worth noting the expert appraisal on the swimming pool health risk assessment (Sheet 3.4.3).

Meeting societal expectations also means **initiating expert appraisals in response to formal requests from stakeholders**. In 2025 this will include the start of work to respond to the request on job insecurity (Sheet 7.1), thanks to DER/DiSSES cooperation, in order to characterise

situations of insecurity within and when entering employment, highlight the links between health and insecurity, and prepare an overview of the health monitoring measures for economically vulnerable populations identified as priorities. In the hospital sector, following requests from various stakeholders (UNAIBODE, SNIBO, SF2H and SFCO), the DER is preparing to launch an expert appraisal on the potential occupational health risks posed by surgical fumes in hospitals (Sheet 4.3.2).

Lastly, in terms of support with societal challenges, the work programme includes a series of actions that reflect ANSES's efforts to support the French Caribbean population, who are faced with persistent chlordecone contamination. The work carried out in various units of the DER (food risks, methods and studies) and the DiSSES will be completed (for ChlorExpo) or continued in 2025. The Agency notes that the management of chlordecone in the French Caribbean – besides its specificities (historical, societal, political, etc.) – is a groundbreaking situation that will generate lessons to be learned for devising new public health approaches.

Anticipating emerging threats and risks is a theme of the new 2023–2027 COP (Theme 2), which is being supplemented by a section on preparedness for emergency or crisis situations. The past year was exceptional, with the establishment of a specific scheme to prepare for the 2024 Olympic and Paralympic Games, which fortunately was little used. Besides analysing and integrating the corresponding feedback, the main source of identification of emerging threats is the data collected by the various vigilance schemes coordinated by ANSES, under the aegis of the DAVS and through the activities of the epidemiological surveillance platforms to which the Research & Reference Division's laboratories contribute. For 2025, the division highlights the start of temporal analyses of work-related diseases based on data from the RNV3PE, with regard to occupational asthma (Sheet 8.1.4) and occupational psychopathologies (Sheet 8.1.5). In the field of toxicovigilance, a large-scale study of cases of poisoning by plants is under way and should be published in 2025. Lastly, the second year of ANSES's cosmetovigilance mission will mainly be devoted to developing a database connected to the reporting portal, in order to facilitate the reporting and registering of cases.

Regarding avian influenza, an expert appraisal to assess the 2024 vaccination strategy in terms of safeguarding health is scheduled for late 2024/early 2025, and feedback will also be obtained from the SAGA protocol, a scheme implemented by *Santé Publique France* and designed jointly by SpF and ANSES. The division is carrying out specific work through an internal request on "the socio-economic impacts of HPAI-type health crises" (Sheet 7.1), and by helping to identify socio-economic factors that may influence the spread of HPAI-type epizootics and the effectiveness of risk management measures (Sheet 7.4). Of course, all eyes will be on the evolution of this virus in the United States, where a new genotype (B3.13) has been responsible for transmission to cattle and even humans, although there is no indication of human-to-human transmission.

4. Contribution to communication measures and institutional relations

Communication and institutional relations are generally addressed at Agency level, but some actions are managed by the division's entities or call heavily on their resources, in accordance with the general orientations for this field. For 2025, this mainly involves the following:

1. Continuing to support and contribute to the in-depth reflection and actions on risk information of the Department of Communication and Institutional Relations (DICORIS), by increasing efforts in connection with more reflective work, and with scientific press such as *The Conversation*;
2. The Paris International Agricultural Show (SIA), in early 2025, will engage the division's teams;
3. In conjunction with the DICORIS, continuing to promote PNR EST-funded work in order to maintain its visibility and attractiveness: the next day of scientific conferences for 2025 will be devoted to research funded by the programme in the area of occupational health, although its organisation has been postponed by six months and there will only be one day of scientific conferences this year.

Concerning institutional relations, the specific points on partnership agreements in 2025 relate to implementing agreements with other key players – including BRGM and InCA – to support the "One Health" approach, and defining how ANSES will contribute to the "One Health" Institute in the area of support with training. Lastly, closer ties with the CNAM have been initiated, as part of discussions on ANSES's contribution to accelerating prevention.

5. Europe and international

These actions are generally coordinated within ANSES by the European & International Affairs Department (DAEI) and are in line with Theme 4 of the 2023–2027 COP goals. Some of them are managed by the division's entities or call heavily on their resources, in accordance with the general strategic orientations. The specific features of European action in 2025 are set out below.

In more generic terms, the division's European and international activities are reflected in three main types of work: (i) joint work combining the efforts of ANSES with its European counterparts in a specific field; (ii) research in which the teams may be leaders or contributors; and (iii) recurring work with the major European agencies in line with the scope of our national missions.

After the change of mandate at the European Parliament, 2025 will see the relaunch of various regulations and directives that have been suspended or paused, for example concerning NGTs, or the plan to develop the REACH Regulation, etc. Each time a draft text falling within the

Agency's remit is prepared, ANSES's scientific teams are called on – together with the French authorities – to analyse the relevance of the proposed provisions with regard to health issues. One of the key points requiring attention, in relation to the **development of the REACH Regulation**, concerns the **conditions under which *in vivo* tests can be replaced by *in vitro* tests, in line with the 3R approach** (replace, reduce, refine) seeking to reduce tests on laboratory animals. The European Commission is preparing a roadmap on this subject to supplement its communication of July 2023. While it is entirely legitimate to optimise the use of animal testing, increased expectations for **reliable characterisation of substance hazards** and the complexity of new hazard classes (such as endocrine-disrupting substances) mean that substitution is not possible without verification. The division will contribute to cross-cutting work within the Agency, and will also seek links with the other agencies/institutes concerned, both in France and in other European countries, to distinguish relevant changes from those needing further validation.

In the area of ECHA's activities on materials in contact with water (Sheet 1.6.3), the division will provide scientific and technical support for the work of ECHA's RAC Drinking Water Working Group. This should enable ECHA to fully resume in January 2026 the activities previously carried out under the "4MSI Group" (a non-legal initiative of four Member States cooperating on a harmonised assessment of materials in contact with water). In the meantime, to meet regulatory requirements in France, 2025 will be the last year in which the division continues to support the assessment of certain substances, based on health issues. ANSES's involvement beyond 2025 has yet to be defined.

In the area of food safety and nutrition, a number of projects are either under way or about to begin. In particular, there is the **assessment partnership under the aegis of EFSA, relating to the risk assessment of food enzymes, food flavourings, and food and feed additives**, which will continue in 2025 (Sheet 1.3.10). It involves supporting EFSA in the preparation of its scientific opinions on certain chemicals regulated at European level. The project has been organised by EFSA in the form of a Framework Partnership Agreement (FPA). The **consortium includes various European partners**: the Austrian Agency for Health and Food Safety (AGES, Austria), National Food Institute – Technical University of Denmark (DTU, Denmark), German Federal Institute for Risk Assessment (BfR, Germany), University of Thessaly (UTh, Greece), National Institute for Public Health and the Environment (RIVM, Netherlands), Norwegian Institute of Public Health/Norwegian Scientific Committee for Food and Environment (FHI/VKM, Norway), Norwegian Institute for Marine Research (IMR, Norway) and the Swedish National Food Agency (Livsmedelsverket) (SFA, Sweden). Initial feedback will be given on the scientific viability and financial sustainability of the partnership model designed by EFSA.

Still on the topic of food safety and nutrition, the safety of food supplements containing ingredients other than vitamins and minerals has often raised concerns at European level. EFSA's Emerging Risk Exchange Network (EREN) has called for the launch of a project to proactively identify emerging risks associated with food supplements. ANSES is leading a project group of eight countries (France, the Netherlands, Belgium, Italy, Portugal, Denmark and Sweden) set up to respond to this. This project (Sheet 1.2.8) is supported by EFSA as part

of the tailor-made activities of the EFSA national focal points. It will also provide input for the discussions of the "Food Supplements" Working Group of the European Heads of Food Safety Agencies (HoA WG FS), which is drawing up a list of substances to be assessed by EFSA as part of a procedure under Article 8 of Regulation (EC) No 1925/2006 on food fortification.

Lastly, concerning nutrition and reference data, the unit responsible for the food observatory will maintain Ciqual's commitment to the European EuroFIR network. Within this partnership, it is contributing to EFSA's "EU Open Food" project to create an open-access database on food composition. To this end, the foods in the Ciqual database will first be coded according to the Foodex2 nomenclature, then the food composition data will be documented and formatted so that they can be added to the EFSA database currently under construction. This work is part of a wider effort to streamline data repositories at European level.

The Partnership for the Assessment of Risks from Chemicals (PARC) is a long-term project, designed to run for seven years. Launched in May 2022 following its validation by the European Commission, its goal is to provide chemical risk assessors and risk managers with new data, knowledge and methods, and to develop the network of specialist players and the scientific skills required to address current, new and emerging challenges in chemical safety. The Science for Expertise Division, and in particular the DER, will be involved in different work packages as WP/task leader or contributor, and will also seek to inform the project's governance body of any strategic needs and priorities for the development of methods or knowledge (Sheet 5.7.2). The new scientific projects launched within this partnership (subject to approval of the Management Board) include one on the bioaccumulation of microplastics, and another on so-called New Approach Methodologies (NAMs), aimed at reducing and replacing animal testing, particularly with a view to their eligibility to meet regulatory readiness requirements. Concerning ANSES, the 2023–2027 COP requires an interim assessment of PARC's contribution to the Agency's missions and work, which will be prepared in 2025.

Regarding work in partnership with our European counterparts, ANSES is coordinating the "Support public policies to promote food reformulation" sub-task in Work Package 5 (Regulation and taxation) of the European joint action "Prevent Non-Communicable Diseases" (Sheet 1.9.5).

Lastly, the division actively contributes to structured cooperation with the European agencies in its field of activity, i.e. EFSA, EEA and ECHA. With regard to contributions to ECHA, the programme of work carried out under the REACH and CLP regulations is part of a specific schedule with the Ministries of Labour and the Environment to prepare dossiers on the different regulatory tools: substance assessment, classification, restriction projects, document on the analysis of management options (Sheets 5.2.2 to 5.2.10). To ensure that the Board of Administrators is fully informed, the work planned for 2025 is set out in these same sheets.

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