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agence nationale de sécurité sanitaire
alimentation, environnement, travail

Connaître, évaluer, protéger

ANSES 2020 work programme

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I. General orientations

ANSES's work programme for 2020 is in line with the strategic orientations drawn up in late 2018 for each of the Agency's fields of activity, and consistent with the commitments made by the Agency under the 2018-2022 Goals and Performance Contract (COP in French):

- food safety and nutrition;
- animal health and welfare;
- environmental health;
- plant health and protection;
- occupational health.

These orientations are also based on the national plans in which ANSES has a leadership role or to which it contributes (PNSE3 – transitioning to the PNSE4, SNPE2, PST3, PNNS, EcoAntibio, Ecophyto+, etc.).

The establishment of cross-functional scientific departments in 2017 has helped strengthen the coherence and efficiency of the Agency's work in each of these spheres of action. It has also fostered a strong, cross-cutting dynamic for the Agency's research, reference and surveillance activities, and enhanced synergies with the Risk Assessment and Regulated Products Departments. ANSES's organisation into four divisions has enabled it to capitalise on better coordination and greater clarity of its activities, missions and responsibilities.

The 2020 work programme must enable the Agency to address pivotal challenges across all its missions and activities, ensuring that it is both a reference and a source of ideas, and can respond effectively in support of the public authorities:

- **Continue acquiring knowledge to support expert appraisal work** by improving understanding of exposure to risks, especially cumulative exposure or exposure related to uses and consumption and how they change, by taking better account of vulnerabilities, and by enhancing assessment of the impact of active substances, products and physical agents. This will enable the Agency to better anticipate emerging risks to populations or workers and improve control and prevention.

- **Contribute to the development of scientific methods and tools that improve risk detection and assessment** (particularly cumulative risks associated with chemicals), refine expert appraisals and reduce uncertainties (for example on identifying and attributing pathogen sources), or integrate new approaches, particularly socio-economic ones.

- **Anticipate, identify and characterise health risks, including during crises**, by continuing to develop the surveillance system and strengthen all the vigilance schemes, and in particular by ensuring that emerging risks are properly understood.

- **Develop an integrated approach to risk assessment**, especially as part of a "One Health" approach in the field of antimicrobial resistance for example, or "One Welfare" in the fields of animal welfare and occupational health for example, and take the complexity of the approaches into account, particularly on subjects being debated in society. The Agency will also remain strongly committed to risk reduction policies, particularly regarding antimicrobial resistance, food safety, plant health, animal health and environmental risks.

- Demonstrate the Agency's commitment to greater efficiency through **better management of deadlines for regulated products**.

All these actions are increasingly taking place in a European and international context, whether they concern reference activities, taking responsibility in European bodies (as in the case of veterinary medicines), participating in major European "Horizon 2020" projects, or contributing to discussions to prepare "Horizon Europe", the European Commission's 9th Framework Programme for Research and Innovation. In 2020, therefore, ANSES will maintain its active involvement in European and international initiatives in all its areas of activity (risk assessment, regulated products assessment, research, reference, monitoring, vigilance and surveillance, etc.) and thematic fields (animal health and welfare, plant health and protection, environmental health, occupational health, food safety and nutrition), in particular through its efforts to build networks and partnerships with ANSES's counterparts in the EU Member States (Germany, Denmark, Netherlands, etc.), as well as with EU agencies (especially ECHA, EFSA and EMA), its partners outside Europe (Canada, United States, Japan, etc.) and with international organisations (OIE, FAO, WHO, EPPO, etc.).

In 2020, ANSES will also continue the actions already undertaken to:

- share the conclusions and recommendations resulting from its scientific expert appraisals with stakeholders and decision-makers, as well as the with general public;
- explain the approaches it has adopted in the area of ethics and collective adversarial expert appraisals, and to provide insights on its methodological principles, especially those relating to levels of evidence and taking uncertainties into account.

In particular, in accordance with its mission to contribute to public debate, the Agency needs to fully integrate its scientific and societal expertise into the work and discussions taking place in its areas of competence.

The tenth anniversary of ANSES in 2020 will be an opportunity to give some perspective to the Agency's work in its areas of activity, in particular by organising a scientific symposium on the link between scientific expert appraisal and public decision-making, bringing international researchers together.

II. 2019-2021 strategic orientations

1. ***Food safety and nutrition***
2. ***Animal health and welfare – Animal nutrition***
3. ***Environmental health***
4. ***Plant health and protection***
5. ***Occupational health***

1. Food safety and nutrition

Food safety and **nutritional issues** are now more than ever before a major societal challenge, due to the economic and health consequences and the high expectations of many citizens for healthier and more sustainable food.

The debates during France's national consultation on the food sector over the past year have shown **the importance attached to improving the quality of our food, at the highest level of the State**. This includes a **symbolic scope** ("I am what I eat"), which has been clearly defined by sociologists and **which goes beyond the health and environmental aspects,** but also other **values,** particularly **ethical** ones (fair remuneration of the players in the production sectors, animal welfare, etc.).

In an increasingly urban society (more than seven out of ten French people live in towns and cities) that is sometimes out of touch with knowledge of production methods, our fellow citizens are increasingly demanding transparency and ethics, whether this concerns animal welfare on the farm, during transport and slaughter, production methods (intensive, extensive, indoor, etc.), exposure attributable to agricultural practices (including for farmers), respect for the environment and sustainability of practices, food safety, nutritional quality, etc. This external view of production practices has helped promote **the notion of "healthy, safe and sustainable" food, an integrative concept of all the different dimensions covered by food.**

In addition, **new consumption trends are emerging** and the link between health and nutrition is being questioned more than ever before, to the point of sometimes becoming an almost existential quest. Food therefore remains an essential and very particular social subject about which everyone wants a say, because it affects us all, being vital by definition.

In these complex debates, ANSES has the scientific capabilities – including in human and social sciences – and tools for **shaping an objective and recognised source of information** in a societal context where false and often dangerous statements flourish and spread via social media, etc. To maintain this, an essential challenge that ANSES is striving to meet is to **remain a credible scientific player in assessing the health and nutritional risks of food,** through an appropriate level of rigour, a strong forward-looking and integrative capability, assertive dialogue with stakeholders, and active participation in **European and international** work.

THEME 1 – Strengthen control of hazard-related health risks to ensure safe food

The recent crises *(Salmonella* in powdered infant formula milk, in particular) on which ANSES continues to deploy considerable efforts are a sign that **controlling health risks associated with foodborne hazards, even when well-known, remains a fundamental challenge** for public authorities and consumers.

- **Documenting hazards[1]: identifying and characterising hazards using state-of-the-art techniques**

ANSES will therefore be actively pursuing its **analytical reference** missions, with 18 mandates in food safety, including drinking water. A **robust strategy for the deployment of new analytical techniques will be pursued and expanded**: these include **genomic** techniques such as whole genome sequencing (WGS) but also high-throughput sequencing (HTS) for biological hazards, and high-resolution and **multi-residue** techniques for chemicals. This will enable ANSES to actively contribute to identifying and characterising hazards (data on prevalence or contamination, etc.) through the **constant improvement of analytical methods,** in terms of their performance (specificity, reducing limits of detection and quantification – LOD and LOQ, speciation in chemistry, etc.) and adaptation to the identification of **all hazards, particularly new or emerging ones** (foodborne viruses[2], non-regulated substances in water such as metabolites of drugs or plant protection products, etc.) and to new food matrices.

[1] **NB: The detailed actions of the laboratories and their scientific strategies are also described in more specific notes that have been included in the laboratory work programme**

[2] Including since 2018 the new National Reference Laboratory (NRL) mandate on foodborne viruses carried out in partnership with Ifremer and the SCL (DGCCRF/DGDDII)

ANSES will also be documenting the **characterisation of hazards** through studies of **virulence factors** or **pathogenicity elements** (toxin characterisation, infectivity in virology, virulence factors of EHEC *E. coli*, etc.) or by acquiring data on host-pathogen relationships through the laboratories' research activities. Acquiring knowledge on antimicrobial resistance (through surveillance data acquired at the Agency and research on acquisition mechanisms) is a major avenue of research. The Agency's work in *in vivo*, *in vitro* and *in silico* toxicology will also help shed light on dose-responses, and establish toxicity reference values (TRVs) and other safety factors (benchmark dose levels – BMDLs).

- **Structuring effective surveillance and data collection**

The structuring of epidemiological surveillance, with the deployment of the SCA Platform (surveillance platform for the food chain) and the associated epidemiological methodologies (source attribution of infectious food diseases, comparison of strains, phylogeny, etc.), will facilitate the description of the **prevalence and development of various hazards**, including emerging ones. With the help of its partners, the SCA Platform will contribute to the production of data (descriptive epidemiology, especially prevalence data, or analytical data, with the identification of risk factors) that can then be used in all food risk assessments.

This structuring will also involve strengthening effective data storage methods (format, validation) in order to make them available for assessments. The consolidation of ANSES's role as the **interface with EFSA** (European Food Safety Authority) and the **data quality** missions will remain essential actions (maintaining and extending the scope of the CONTAMINE database; QUALIPLAN project and long-term follow-up; participation in EFSA's ad hoc scientific networks).

- **Documenting exposure and assessing risks[3]**

Total Diet Studies (TDS), conducted at regular intervals (approximately every six to seven years) with a specific approach each time (new hazards, particular populations, etc.), are designed to **estimate dietary exposure to numerous chemicals** in foods (numerous PPP[4] residues, FCM[5] migration products, etc.). These studies are essential for documenting hazards, exposure and risks. ANSES will therefore continue to consolidate its achievements in this area by proposing an innovative TDS3 (inclusion of previous results, new hazards, at-risk populations, etc.). The conceptual framework for this new TDS3 has now been finalised.

In addition, a highly innovative forward-looking analysis on the possibility of **adapting the TDS construction methodology to biological hazards** will be carried out.

Supported by preparatory symposia, an in-house debate will be held on food risk assessment issues correlated with bacterial antibiotic resistance (documenting the hazard, issues of exposure, methodology for understanding the associated risks, etc.).

- **Ranking hazards and foods presenting a risk**

The recommendations of the Interministerial Committee for the modernisation of public administration (CIMAP) highlighted the need to better inform public decision-makers by proposing a **ranking of risks and hazards, in order to rationalise control and surveillance priorities**. To this end, ANSES is undertaking extensive work which, based on all the food hazards, should lead to creation of a system for ranking hazards and their food vectors, and taking very different hazards into account in an integrated way (dioxins versus *Salmonella*, for example). This presents a major methodological challenge, particularly because it involves comparing hazards with different actions (essentially acute actions for biological hazards and chronic actions for chemicals). A multiple-criteria decision analysis (MCDA) will be used to address this challenge.

[3] NB: To carry out all these actions, as well as those of Theme 2, it is essential to maintain measures to document food consumption. These are presented in the elements of Theme 3: Individual and National Consumption Studies (INCA).
[4] Plant protection products
[5] Food contact materials (packaging, etc.)

THEME 2 – Document the food supply and nutritional risks for a healthy diet

The increase in the incidence of diet-related non-communicable diseases (diabetes, cardiovascular diseases, some cancers) is a reminder of **the crucial importance of nutritional issues in public health**. The obesity epidemic remains a particularly worrying warning sign. In this area, ANSES has offered a variety of measures and proposals.

- **Documenting food composition and the food supply: OQALI and CIQUAL**

A balanced diet requires the right individual habits but also that the foods offered to the consumer have an adequate nutritional composition. **Improving the quality of the food supply is therefore an essential part of nutrition policy**.

To achieve this, **strengthening the Food Quality Observatory (OQALI) jointly with INRA will remain a key challenge.** For ANSES, the aim is to sustain OQALI's activities (facilities and FTEs), and consolidate and extend them (inclusion of Nutri-Score statements in observations from 2018, study on the presence of additives, possible work on out-of-home catering or the overseas territories), particularly by regularly publishing studies on food quality for each of the major food sectors and by monitoring the deployment and influence of the Nutri-Score system.

At the same time, ANSES will consolidate its medium- to long-term vision of the work priorities related to the **CIQUAL** table, which provides information on the average nutritional composition of the most widely consumed foods in France. This will include the following development areas in particular: maintaining representativeness with regard to the French food supply by **including new consumption trends (organic, gluten-free, vegan foods)**; opening up to **new types of data (free sugars, amino acids, etc.)** assessed by modelling tools (new methodological developments); supporting partners (*Santé Publique France*) in the dissemination of tools or **educational materials** for the general public, as well as for dietitians and nutritionists.

- **Documenting the influence of cultural behaviours and determinants**

The quality of the food supply is a determinant of nutritional quality, but other factors are equally essential. ANSES will help document the extent to which **physical activity or the level of sedentary behaviour are in line with the health guidelines in this area**. It will also work on burning issues relating to the **rate and quantity of food intake** and their influence on health parameters. Contributions from the human and social sciences (HSS) are often essential here.

- **Documenting intakes and inadequacies: assessing risks and contributing to the PNNS**

ANSES will continue to document and update data on adequate and inadequate nutrient intakes using the latest data from its INCA3 study (Individual and National Study on Food Consumption). This is a recurring activity based on the available data updates.

In addition, as part of the French National Nutrition and Health Programme (PNNS), ANSES will facilitate the exploitation of its conclusions on **consumption guidelines** for all populations, especially children, pregnant and breastfeeding women, and the elderly. This provides the public authorities with invaluable support and a scientific basis for the messages developed and then relayed by *Santé Publique France*.

THEME 3 – Anticipate new risks and trends to ensure evolving and integrated assessments

- **Developing tomorrow's risk assessments (RAs): constantly improving the methodology**

Scientific questions are constantly emerging, even for well-documented hazards: taking aggregate exposure into account (consideration of different routes of exposure), exposure to mixtures (cumulative exposure); suitable toxicological consideration of endocrine disruptors, etc. New scientific questions are increasingly being added to purely nutritional ones, particularly on the role of the "**exposome**" in the development of chronic diseases and certain metabolic diseases. ANSES will therefore also place its activities in a **methodological and scientific framework** with major developments that will contribute to a better characterisation of exposure to health hazards and more appropriate RAs:

- Continuation of **methodological advances on mixtures and their practical application to RAs**;
- Continuation of assessments of **endocrine disruptors** (EDs); involvement of ANSES in the SNPE2[6] and the PNSE4[7];
- Involvement in **biomonitoring** issues (definition of relevant markers and meaning, including the issue of "omics", and setting critical blood concentration values, etc.), with a leading role in the European HBM4EU[8] project;
- Development and improvement of **physiologically-based toxicokinetic (PBTK) models** in order to refine RAs;
- Methodological work on **exposure factors** (space-time budget, weight, sex, etc.);
- **"Multi-hazard"** approach **by production sector** (biological hazards);
- **Source attribution** of infectious diseases;
- **Proportionate consideration of uncertainties and levels of evidence in RAs;**
- Differential identification of risks to **specific populations:** consideration of specific sensitivities (link with toxicology: sensitivity window for reprotoxic effects/pregnant women or neurotoxic effects/children, etc.).

- **Understanding new risk factors and adjusting the RAs**

The INCA studies provide consumption data essential for the assessments in Themes 2 and 3. In addition, particularly since the most recently published study (INCA3, 2017), they have also enabled information to be collected on **new consumption or lifestyle habits and patterns that influence diet**. In conjunction with *Santé Publique France*, ANSES is considering the approach to be taken for a **new INCA4 study that responds to the recommendations** made during previous expert assessments, particularly on the **specific consumption characteristics of certain population groups**, including **inhabitants of the French overseas territories**, vegetarians, vegans, etc.

ANSES is identifying new practices or growing trends needing RAs to be adjusted to better factor them in and **verify their possible health implications, and maintain effective vigilance mechanisms**.

The INCA3 study identified practices that represent new risk factors, such as a marked increase in the **consumption of raw animal foods** and a tendency to consume food **after the recommended consumption dates**. Similarly, there is a noticeable trend towards **new products or ranges** (from organic farming) or towards **specific diets** (vegetarian, vegan, "free from...", etc.). ANSES will continue to focus on new products, new technologies, new recipes and consumption patterns: **novel foods** within the meaning of the legislation, **GMOs**, by adopting an approach that focuses particularly on RA methodologies rather than on individual applicants' dossiers, "**nanos**" used in foods, and **food supplements**, whose consumption is increasing very sharply.

[6] **National Endocrine Disruptor Strategy**
[7] **National Environmental Health Action Plan**
[8] **See the environmental health orientations**

- **Vigilance and emerging threats**

ANSES will maintain a high level of alertness with regard to certain foods **through its Nutrivigilance and vigilance scheme** (coordination of the CAP-TVs[9]) and the competence of its working group (WG) of experts on plants. The recently established Phytopharmacovigilance **(PPV) scheme** will remain a key tool for the post-MA management of **plant protection products** and the identification of their possible impacts, particularly in the food sector.

- **Moving towards integrative assessments: "healthy, safe and sustainable" food**

A forward-looking analysis (feasibility, priority topics) on taking the **overall impact of food practices** into account, particularly in terms of **sustainability**, will be launched, with the involvement of key partners. This highly integrative work will be expected to address a number of issues: societal (consumer expectations and behaviour, outlook for food in the face of climate change), nutritional (balanced diets), health (food safety, occupational exposure), environmental (sustainability of production methods and practices), and even ethical (animal welfare, special diets, etc.).

The issue of documenting the influence of the microbiota at different levels (influence on antimicrobial resistance, interaction with digestive pathogens, interactions between nutritional quality and health-promoting microbiota, etc.), as well as its inclusion in the Agency's work on food risks, is expected to be discussed during an internal preparatory debate.

THEME 4 – Participate in national, European and international exchanges and cooperative projects to ensure the quality of expert appraisal

Cooperation with ***Santé Publique France*** (foodborne illness outbreaks, PNNS, studies[10], biomonitoring, particularly in the context of polluted sites and soil, etc.) is essential and will be strengthened. It will be useful to obtain updated epidemiological information on food topics (issue of the share attributable to exposure in chronic diseases, etc.). This cooperation will ensure **effective synchronisation of the missions** of the two agencies without any risk of redundancy.

The ANSES NRLs will also focus on **working closely with the NRCs**, particularly on epidemiological surveillance issues and during foodborne illness outbreaks and crises.

ANSES will take care to maintain its **highly specific support for the public authorities on threats** (action on CBRN risks and the Biotox and Piratox plans). The agreements signed with its main counterparts **(CIRAD, CEA, Ifremer, Inserm and INRA** in particular) will be implemented through joint research work. A more general debate on areas for future research may draw on useful developments within the framework of the AllEnvi Alliance.

Scientific exchanges (strains, sequences, contamination data, RA models and methodologies, scientific personnel, etc.) will be promoted and targeted at partners with **similar functions** and with whom ANSES has forged regular and close relationships. Some of these have been formalised by **partnership agreements**, particularly in Europe with the BfR, DTU-Food, and RIVM[11] and internationally with the FDA, CFIA, Health Canada and the NIFDS[12]. Targeted cooperation actions with third countries that are strategic for France and Europe (neighbouring countries, India, China, etc.) will continue. The **ongoing collaboration with EFSA** will contribute to research and RA work, and focus on strengthening exchanges and reducing divergences where necessary. An international strategy will need to be established for French contributions in the area of WGS in food, particularly to follow up the international symposium being organised jointly with the partners BfR, DTU-Food and the NIFDS for spring 2019.

[9] French Poison Control and Monitoring Centres
[10] **Discussions on Esteban – INCA**
[11] BfR (Federal Institute for Risk Assessment, Germany), DTU-Food (Danish Technical University, National Food Institute), RIVM (National Institute for Public Health and the Environment, Netherlands)
[12] FDA (Food and Drug Administration, United States), CFIA (Canadian Food Inspection Agency), NIFDS (National Institute of Food and Drug Safety Evaluation, South Korea)

Lastly, ANSES will endeavour to play a part in **pivotal research projects**, both for the laboratories and for risk assessment. Following the example of the European Joint Programme (EJP) on One Health coordinated by ANSES and covering food zoonoses, antimicrobial resistance and emerging risks, these will engage the Agency in a process of networking, exchanges of research equipment and scientific developments, **on the topics of interest in the three previous themes**.

2. Animal health and welfare – Animal nutrition

Preamble

The details below present the main policy orientations proposed by ANSES in the area of **animal health, welfare and nutrition**. This section also reviews some of the major work completed by the Agency in 2019 and proposes a few key themes for the 2020 work programme of the Agency's laboratories, French Agency for Veterinary Medicinal Products (ANMV) and assessment departments with regard to animal health, welfare and nutrition.

Outlook for 2020

The next twelve months will be the first full year in which the laboratories operate under their new organisation. This includes the mergers of the Dozulé Laboratory with the Maisons-Alfort Laboratory for Animal Health, and of the Niort Laboratory with the Ploufragan-Plouzané Laboratory. In 2019, the laboratories' teams quickly demonstrated the relevance of these groupings, which promote synergies between the entities and are supported by the cross-functional programmes set up and funded by the Strategy and Programmes Department.

A. Activity in 2019 mainly characterised by the consequences of previous health events

Previous (avian influenza, bluetongue, tuberculosis, brucellosis, etc.) or current (African swine fever – ASF, in Belgium) health crises have been keeping our teams busy. They have concentrated on producing models to improve our understanding of past or current events, in order to better anticipate the preventive measures that could be implemented if these diseases re-emerge in the near future. These crises have been mobilising our teams in risk assessment, research and surveillance. The work concerns both upstream research on vaccines against ASF, for example, and finalised research to implement health indicators for the cleaning and disinfection of trucks transporting live animals. Our teams also focused on intervention epidemiology, where we recently assisted the Departmental Directorates for the Protection of Populations (DDPP) with cases of H3N1 influenza virus (which, despite being of low pathogenicity, is nevertheless of concern in northern France) and equine infectious anaemia in the south-west.

B. Surveillance

The establishment of a scientific department for epidemiology and surveillance that cuts across the Agency's different policy areas, by bringing together the Agency's teams responsible for reference activities, its epidemiology units and the entities in charge of risk assessment, should be a key element in the definition of a reaffirmed Agency strategy for epidemiology research and contribution to surveillance.

Along with its partners and through its strong commitment to coordination of the ESA Platform, ANSES will contribute to the effective functioning of a system that is vital to epidemiological surveillance of animal diseases in France.

In addition, surveillance activities in 2019 were profoundly marked by changes in personnel (retirement or change of career path). Despite this, ANSES has maintained its course in terms of coordinating the surveillance platform for animal health, with a new team that quickly managed to grasp the challenges.

C. Analytical reference

Work in support of the DGAL by the teams at ANSES, GDS France and regional laboratories should in the short term lead to a strong regulatory framework for the **control of reagents and diagnostic kits by the NRLs**. In particular, for each disease, this new framework will define the role played by the NRLs in the initial verification of diagnostic kits and in their possible batch-by-batch verification, and will enable a debate to be initiated on optimising the scheme in France and Europe. As such, the Niort Unit was recently appointed National Reference Laboratory for bovine viral diarrhoea (BVD) in support of the surveillance and control plan put in place by the DGAL and professionals.

D. Antimicrobial resistance

We will continue our work on monitoring antibiotic use in animal production sectors and on antibiotic resistance of pathogenic and commensal bacteria, and our activities on this subject in 2020 will be marked by the continuation of EcoAntibio 2 and publication of the results from the research programmes funded by the EcoAntibio 2017 plan. The work of the Scientific Department for Antimicrobial Resistance will be especially dependent on implementation of this plan. Programmes will be developed to increase our knowledge of the mechanisms supporting resistance and their transfer between bacterial species, and support for therapeutic decisions will be improved through the validation of tools for the rapid detection of antimicrobial resistance on farms. In addition, in 2020, the NRL is expected to examine the first applications for validation of rapid antibiogram methods in food safety and animal health.

The ANMV will continue its European work, in particular, on tools for monitoring the use of antimicrobials (ESVAC) and by chairing the AMEG (Antimicrobial Expert Group), which has been mandated by the European Commission to review the categorisation of antibiotics according to their importance for humans and the risks of transmission of antimicrobial resistance from animals to humans. This work is particularly important because it has a clear impact on European policies for the use of antibiotics. In the international arena, the ANMV will continue providing its expertise as an OIE Collaborating Centre for the establishment of the OIE's global database. On a national level, the ANMV will be pursuing its IT work to improve surveillance tools and their necessary adaptation to the various animal sectors (swine, veal, poultry and domestic carnivores).

E. Animal welfare

Reference work in the field of animal welfare will take a decisive step forward in 2020 with the launch of the **European Union Reference Centre** (EURC) for the welfare of poultry and other small farmed animals, which ANSES has been tasked with coordinating with the support of Spanish, Italian and Danish research units. ANSES will lead the consortium and perform most of the reference activity on poultry welfare. Awarding this first EURC mandate to France is the first official recognition of ANSES's involvement in this area.

ANSES's research and expert appraisal work on animal welfare relies on a research unit within the Ploufragan/Plouzané/Niort Laboratory (EPISABE, from the merger of the EBEAC and EBEP units), as well as a scientist within the PEBER Unit (Niort) of the same laboratory, the national animal welfare coordinator in the Strategy and Programmes Department and the Expert Committee on Animal Health and Welfare (CES SABA). The coming year should see the start of the first tests in our poultry barn of the future (for broilers) and the renovation of our aviary for rearing layer hens. This fundamental multi-year work will be performed with the partners of the planned regional innovation laboratory (LIT Ouestérel: PIA3 TIGA call for projects), to enable shared use of this equipment, which has been funded by the CPER (State-Region plan contract).

Since September 2018, the risk assessment part of formal requests relating to animal welfare has been integrated into the CES SABA at the same level as formal requests concerning animal health, thereby fostering a holistic approach to animal welfare and health. Consideration of this issue by society has given rise to numerous initiatives in the animal production field, which will be able to take advantage of the scientific guidelines drawn up by ANSES and will have a positive impact on the welfare of farmed animals. The expert appraisal on the guide to good practices for Equidae welfare will also be finalised in 2020.

F. European partnerships

At **European level**, 2020 should see the continuation of the previously mentioned **European Joint Project (EJP) on One Health**, and a number of research programmes are expected to emerge very soon from its second internal call for projects.

Besides responding to calls for European projects on specific themes (preparation for Horizon Europe), our laboratories maintained close relations with their European counterparts. These include PIWET in Poland on wildlife, and Sciensano in Belgium, with whom we have been sharing the EU Reference Laboratory (EURL) foot-and-mouth disease mandate since 2019. Similarly, our active participation in the Joint Programming Initiative on Antimicrobial Resistance (JPI-AMR) and our future FAO Collaborating Centre on Antimicrobial Resistance deserve to be highlighted.

G. Outlook regarding veterinary medicinal products

A major event in 2019 will probably be the effective exit of the United Kingdom from the European Union. The ANMV will therefore continue implementing its roadmap in order to affirm its position in Europe in the new agencies network model that is likely to emerge. It will be a driving force in the network of heads of agencies, where it participates in the Management Group, now as the only agency with a purely veterinary activity.

It will continue managing the task force set up to prepare for the entry into force of the new regulations, with particular emphasis on the reform of European database management (SPOR project) and the work needed in France to adapt its activities to the new regulation and amend national law accordingly.

The ANMV will also be pursuing its work in the area of new therapies and alternatives to antibiotics, to achieve better regulatory visibility and define the content of the data to be provided.

Work will continue on developing the IT tools essential to the ANMV's activity and performance; the VIGIE project, which involves setting up a new long-term scalable national pharmacovigilance database, will help optimise the operations needed for managing reports to the pharmacovigilance scheme. Similarly, the ANMV will continue to examine the digitisation of processes and data within ANSES.

Lastly, the ANMV will continue **its international activities**, particularly with Morocco, Thailand and China, as well as its expert appraisal work as an OIE Collaborating Centre, participating as a trainer in the 6th cycle of focal point training, whose main themes – besides combating antimicrobial resistance – are autogenous vaccines, veterinary drug quality and pharmacovigilance.

H. Risk assessment

Risk assessment activities in animal health will target threats to France due to certain health hazards spreading across Europe. African swine fever (ASF) and *peste des petits ruminants* are getting closer to France and require preparatory measures. Our teams have been working intensely on the emergence of ASF in wild boars in Belgium. The state of emergency that has prevailed since September 2018, with many formal requests to be addressed, will make way in 2020 for more fundamental issues raised by the ASF action plan established by the French authorities. Our teams have also needed to maintain a high level of readiness to assess any **risk of introduction** or spread of urgent health hazards.

France is also combating major animal diseases on its territory. This is the case with bovine **tuberculosis**, which is the subject of an eradication action plan. The fight against bovine tuberculosis touches on many scientific fields, from diagnostic methods and their use in screening through to future-oriented vaccination issues, in a particularly complex multi-host epidemiological context involving both domestic animals and wildlife.

The question of the interface between **wildlife** and domestic animals recurs repeatedly in formal requests on animal health, requiring an **integrated approach** to risk assessment and calling on many complementary scientific disciplines in order to combine epidemiology, ecology and infectiology. Environmental considerations are increasingly being taken into account in risk assessment and the analysis of animal health management options, whether for purely animal diseases or zoonoses. This development, which has been noticeable for several years now, opens up wider prospects for questioning how **biodiversity** can be taken into account in ANSES's work. Incorporating the **One Health** concept into the collective expert appraisal approach requires close attention to be paid to interactions, not only between humans and animals, but also between humans, animals and the environment.

The recent integration of the **Vectors** mission into ANSES's activities is a further opportunity to apply the One Health concept in the risk assessment process.

Bee health also requires an integrated approach to risk factors. It is with this in mind that in 2020 ANSES will have to assess appropriate measures for combating the Asian hornet.

Lastly, animal botulism, a potentially zoonotic disease affecting many animal species related to the environmental reservoir, will be the subject of an updated risk assessment in 2020. The subject symbolises the Agency's cross-cutting work between its research, reference and risk assessment units in the fields of animal health and food safety.

In animal nutrition, the Agency's work will be characterised by the assessment of risks associated with practices reusing downgraded foodstuffs from the agri-food industries as animal feed. This is in line with a political will to develop the circular economy, which is demonstrated, for example, by the requirement for companies to sort their biowaste in order to reuse it. The Act of 11 February 2016 on combating food waste explicitly imposes "*reuse for animal feed*" as one of the actions to reduce waste from "**old foodstuffs**". This reclassification of products raises a number of risk assessment questions, which will constitute a major part of the animal nutrition work programme.

In addition, the global movement in which animal production sectors have committed to **reducing the use of antibiotics** is taking place alongside the emergence of new alternative products and new claims that will lead to formal requests by the authorities for assessments of the **scientific relevance** of certain claims, or applications for authorisation of tests for additives.

Lastly, one of the specificities of animal nutrition, due to its positioning near the start of the food chain, is that it is included in many **cross-cutting formal requests**, such as toxicological risk assessments related to **polluted sites and soil**, requests associated with the presence of pathogens in livestock farming, and assessments of Guides to Good Hygiene Practices in the food sector Food.

All these activities are in line with the constant development of collective expert appraisals, reflected in research and implementation of **new methods**, combined with the characterisation of uncertainties and the weight of scientific evidence, to enable ANSES to issue ever more transparent opinions on the state of available knowledge.

3. Environmental health

Health and environment issues for 2019-2021: what are the challenges facing ANSES?

The state of knowledge on the environment's influence on human health is constantly evolving: some risk factors are well known and avoidable in relation to pollution of air, water and soil, noise, exposure to harmful chemicals, etc. However, there are many challenges, both long-standing and emerging, that are unresolved due to environmental changes that may affect human health, the environment and economic activity. These include the consequences of unsustainable consumption, demographic growth and its territorial distribution (urbanisation and ageing of the population), uncontrolled industrial and technological changes, and development of the circular economy. These factors interact and their impacts are multiplied on the environment, on plant and animal species and humans. All this is aptly summarised by the concept of "One Planet, One Health". The influence of human activities on the environment also continues to grow and have a negative impact on the climate. Climate change in turn influences the environment, leading to changes in ecosystems and biodiversity.

In this context, there are numerous uncertainties due to a lack of knowledge on the effects of many agents: chemicals found in the environment (carcinogenicity, endocrine disruption, effects on immunity, metabolism, etc.), biological and/or physical agents, and their interactions with living organisms. Data on environmental contamination and exposure are uneven: they are abundant on water in the environment and on drinking water and food. However, they are far less numerous when it comes to soil, air (outdoor, indoor), dust, consumer products, discharges and waste. The combined or cumulative health effects of various agents, particularly chemicals, simultaneously or over successive periods of life, are covered by the concept of the "exposome". They pose a major challenge to knowledge.

Situations and modes of exposure and vulnerability to the effects of agents need to be identified and characterised (prenatal and postnatal development periods: pregnant women, young children, peripubertal period) along with situations where certain population groups are overexposed (work environment, residents of areas impacted by multiple pollutant releases, etc.). Similarly, the various determinants of exposure must be identified in order to shed light on sources of social and environmental inequalities and identify courses of action. Special attention should also be paid to contaminants/agents potentially associated with serious or common diseases such as cancer and allergies, and health effects related to endocrine disruption.

Expert appraisal work and support for research on risks that have generated strong scientific and social controversy should continue to feature prominently in the Agency's activities. These include health risks associated with endocrine disruptors, nanomaterials and pesticides, as well as risks potentially associated with certain emerging technologies. Dialogue with the stakeholders involved in some of these themes will continue in forums, to fuel discussions on the Agency's work.

The environmental health actions to be developed over the next three years should take advantage of these findings and be consistent with the national plans that determine ANSES's priority expert appraisal and research needs, with European and international orientations (regulatory and research), the Agency's monitoring activity, and optimised use of vigilance and research data. **These actions should therefore be in line with the various other plans**, such as the National Public Health Plan (PNSP), the National Endocrine Disruptor Strategy (SNPE2), the Ecophyto2+ Plan, the future National Environmental Health Action Plan (PNSE4) which is expected to follow on from PNSE3 2015-2019, the Occupational Health Plan (PST3), the Cancer Plan, the Biodiversity Plan, the National Climate Change Adaptation Plan, the National Nutrition & Health Plan (PNNS), the Micropollutants Plan, etc.

Safety in terms of the environment and health should therefore be structured around several themes:

1. **Anticipate emerging threats and risks** associated with changes to the environment and climate that are sources of scientific and societal controversy (scientific, technical and societal monitoring, coordination of vigilance schemes);
2. **Improve/refine expert appraisal practices** to more effectively contribute to public decision-making, particularly by seeking to:
    - identify vulnerable populations and critical exposure situations (exposure windows, overexposure situations, etc.) including foetal/embryonic development and the first few years of life;
    - identify collective and individual uses and behaviours, socio-economic determinants that dictate the circumstances and modes of exposure, sources of social and environmental inequalities;
    - use methodological guides on assessing levels of evidence and uncertainties in expert appraisal work (ANSES, 2017).
3. **Develop the risk assessment tools** (cost-benefit studies, socio-economic studies, etc.) needed to ensure that risk management recommendations are better taken into account;
4. **Develop interdisciplinary methodological tools** to enable integrated risk assessment (exposome): cumulative risks, aggregate risks, human/animal/plant interfaces, use of biomonitoring and vigilance data;
5. **Support research in environmental health**, particularly to obtain data that will provide insights on the exposome, and develop research to forecast the risks of the future. This will be pursued through support for the National Research Programme for Environmental and Occupational Health (PNR-EST) and its calls for projects;
6. **Develop European and international collaborations** (participation in research consortia, strengthening bilateral relations with our counterparts, contribution to the work of international organisations such as the WHO, etc.).

Main challenges relating to chemicals

In line with various European chemical regulation policies, and in particular to support the objectives of the strategy to limit the use of chemicals, the Agency will be providing scientific assistance to the authorities through the following work:

- **Endocrine disruptors (EDs)**

The adoption in 2019 of the National Endocrine Disruptor Strategy (SNPE2), signed at ANSES on 3 September, will guide the Agency's work on the ED substance assessment programme. A consultation will be held on a list of substances to be examined by the Agency with a view to submitting them at European level (European REACh and CLP Regulations, etc.) on an annual basis, within the framework of an annual meeting involving several Thematic Steering Committees (interCOT). A methodology for prioritising substances with ED potential will be developed. A method for categorising these substances to discriminate between "known", "presumed" or "suspected" EDs will be developed and applied to the assessment of substances assigned to the Agency in this context. Substances with ED potential will be identified in various media, including outdoor air. As part of its assessments of plant protection and biocidal active substances (respectively under Regulation (EC) No 1107/2009 and Regulation (EU) No 528/2012), the Agency will be implementing the "Guidance Document for the implementation of the hazard-based criteria to identify endocrine disruptors (EDs) in the context of Regulations (EC) No 1107/2009 and (EU) No 528/2012" adopted at European level. It will also assess this document's applicability in contexts other than for biocidal and plant protection substances, identifying any necessary adjustments for these situations where appropriate. Health reference values (TRVs, OELs, IAQGs, etc.) will be produced, as well as critical concentration values in biological media (see below).

➢ Nanoparticles

The Agency will provide scientific and technical support to the authorities, particularly by responding to the public consultation on the definition of nanoparticles, which should be harmonised at EU level in view of the current differences between various regulations. In addition to the work on nanoparticles in food planned by the PNSE3, the Agency will continue its work to better understand the industrial sectors that use nanoparticles. After establishing an initial reference value for a specific form of Ti02, it will continue its work on health reference values for nanoparticles (TiO2, etc.) by requesting additional data from reporters of these substances, in particular under the European REACh Regulation[13]. It will continue to manage the national mandatory reporting portal. In 2020, ANSES hopes to bring together various studies on the risks associated with nanomaterials.

➢ Chemical mixtures and the exposome

Building on its own work (Contalait project, aldehydes in indoor air, etc.), the European projects (EUROMIX, Acropolis, HBM4EU, etc.) in which it participates or has participated, and the international progress made in this field, the Agency's task will be to lay the methodological foundations for ranking the priority chemical mixtures to be taken into account in its expert appraisals. This will also be in line with work that the Agency will undertake to identify the methodological bases for exploring the concept of the exposome and its use in expert appraisals.

➢ Health reference values

Toxicity reference values (TRVs), occupational exposure limits (OELs), indoor air quality guidelines (IAQGs), biomarkers of exposure (BMEs) and biological limit values (BLVs) are essential tools for quantitative risk assessment. Critical concentration values in biological media must be developed in order to assess risks and guide public action in the event that there are BMEs to contaminants to which the population is exposed through multiple routes (ingestion, respiratory, dermal). This work will particularly consider the needs related to situations involving industrial sites (classified installations for environmental protection – ICPE) and polluted sites and soil. Methodological work will be carried out on developing internal TRVs, or TRVs for chemical mixtures, to take advances in toxicology into account and better meet the challenges of health risk assessment.

➢ European REACh and CLP Regulations

Work on chemicals in the framework of the REACh and CLP[14] Regulations will include the assessment of substances listed in the Community Rolling Action Plan (CORAP) and a re-assessment of those listed in past years, for which additional data have been obtained. There will also be an analysis of the best risk management options (RMOA), identification of substances of very high concern (SVHC), proposals for restrictions on use when risk situations are identified, and a response to public consultations on revisions to methodological guides. Under the CLP Regulation, the Agency will submit several new proposals for the classification of chemical substances. It is important to coordinate the Agency's work with other European agencies because of the sectoral segmentation of the substance assessment methods. One example is the circular economy, which is a major emerging issue.

[13] European Regulation (EC) No 1907/2006 of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACh) came into force on 1 June 2007

[14] European Regulation (EC) No 1272/2008 of 16 December 2008 concerning Classification, Labelling and Packaging of substances and mixtures

- **From the assessment of plant inputs to phytopharmacovigilance (PPV)**

The challenges identified for the coming years in assessing the health and environmental impacts of plant inputs, both synthetic plant protection products and biocontrol products, relate to the production of knowledge and methods to guarantee a high level of protection of human health and the environment, and ensure that products placed on the market are effective.

With this in mind, the scientists involved in assessing these products have worked hard to develop or improve assessment methodologies. This work is most often undertaken in partnership with other organisations or in the framework of national, European or international working groups. Their purpose is not only to enhance the interpretation of assays used to determine chemical hazards, but also to construct detailed exposure scenarios and models used in assessing hypothetical risks and efficacy. The Agency can also fund specific studies to encourage the production of new knowledge needed for its expert appraisal work.

Monitoring the adverse effects of plant protection products (PPPs) on humans, plants and animals and more generally on all environments, and keeping track of resistance, is the core purpose of PPV. Its actions will be strengthened to take account of biodiversity, the presence of PPP degradation products in the environment and the impact of the increasing use of biocontrol products. Work will be directed towards the identification of substances of concern, mixtures and cumulative exposure. Four strategic themes will be developed: ambient air; exposure and impacts on agricultural workers; bees and pollinators; biodiversity and environments (soil).

- **Biocides**

The issues identified for the coming years in terms of assessing the health and environmental impacts of biocidal active substances and products are similar to those presented above for plant inputs. They concern the production of knowledge and methods to ensure that a high level of protection of human health and the environment is maintained and that the solutions placed on the market – particularly regarding vector control and public health – are effective.

The scientists involved in assessing biocides will therefore contribute to a wide range of work on developing or optimising assessment methodologies, most often carried out in partnership with other organisations or as part of national, European or international working groups. Its purpose is not only to enhance the interpretation of assays used to determine chemical hazards, but also to construct detailed exposure scenarios and models used in assessing hypothetical risks and efficacy. The Agency may also fund specific studies to encourage the production of new knowledge needed for its expertise. Lastly, the Agency will continue issuing marketing authorisations for biocidal products, against the backdrop of a continuous increase in the number of applications to be examined.

- **Consumer goods**

The work carried out over the past few years on the assessment of risks associated with exposure to **consumer products** (play-mats or toys for children, textile clothing, nappies, feminine hygiene products, etc.) has highlighted the lack of knowledge on the chemical composition of many products, the presence of undesirable contaminants (skin sensitisers, carcinogens, etc.) in some of them, and more generally questions on the safety of numerous products. Work in this area is expected to focus mainly on identifying new product uses resulting from recycling, as well as the environmental dispersion of plastics in different matrices or their reuse and consequences in terms of health effects.

Ranking the chemicals (e.g. flavourings) that may be found in new **tobacco and vaping products** and taking inhalation effects into account should also identify mixtures that potentially work in synergy with nicotine or other factors to maintain addiction. Work will be conducted to document the uses and exposure models of these products, with a view to assessing the risks.

- **European and international work on chemicals**

The Agency will continue to take part in European projects such as HBM4EU 2017-2021 (co-funded by Horizon 2020): ranking chemicals of interest, defining health guidance values for biomarkers of exposure (bisphenols, perfluorinated compounds, etc.). It will pursue its involvement in the European Joint Action on Tobacco Control (JATC). As in previous years, ANSES will continue to participate in the WHO's Chemical Risk Assessment Network (WHO/IPCS), whose objective is to improve chemical risk assessment by promoting interactions between organisations.

These approaches should also be seen in the context of the Agency's desire to support the creation of an inter-agency European fund for the toxicological study of agents of public health interest, aimed at improving knowledge of the hazards and effects of a large number of agents, whether chemical (toxicological, ecotoxicological studies) or physico-chemical (nanoparticles, etc.), in addition to processes. Lastly, work will continue to take place within a European framework, particularly through ongoing participation in the European ERA-ENVHEALTH network, the work of the European Environment Agency (EEA) and future participation in the new European Horizon 2020 project "HERA (Integrating Environment and Health Research: A Vision for the EU)", coordinated by Inserm.

Main challenges relating to water

The EU project to revise Directive 98/83/EC on the quality of water intended for human consumption is an important public health issue, which will lead the Agency to continue its scientific and technical support activities with the relevant ministries on this subject. It also raises multiple questions about the assessment of past or emerging risks related to regulated or non-regulated chemical contaminants that may be present in water resources and more generally in aquatic environments, such as nanoparticles, microplastics, drug, cosmetic and pesticide residues, as well as the issue of the effects of mixtures. These questions also extend to the efficacy and safety of water processes and treatment, the safety of materials in contact with drinking water, etc. The Agency will be seeking feedback and conducting an analysis on the issue of quality thresholds for pesticide residues in water (Vmax). The development of antibiotic resistance phenomena among bacterial strains with dispersion in environmental media is also a subject of major importance justifying continued activity in this field: work on the mechanisms underlying the selection and transmission of antibiotic resistance via the environment. All these activities should be placed in the context of the impact of climate change on the various environmental media (particularly water stress), a particularly sensitive subject with regard to water resources (availability of the water resource, modification of its characteristics, etc.), the need to preserve this resource, and questions about the effectiveness and safety of wastewater reuse systems.

Main challenges relating to air

The EU's "fitness check" of the European directives on ambient air quality (Directives 2008/50/EC and 2004/107/EC) until the end of 2019 will require scientific and technical monitoring and support for the supervisory ministries. Several expert reports have been published that will provide input for this work (pesticides in air, emerging non-regulated pollutants, ambient air quality standards, etc.). Among the main issues that the Agency will have to address are mixtures of substances in the air, work on particles (ultra-fine particulate matter, nanoparticles, physico-chemical composition, and scientific and regulatory standards) and settled dust in indoor and outdoor air (risk assessment, proposed guidance values, etc.).
Health effects associated with biological agents or bioaerosols (mould, toxins, harmful plant species) are becoming better known (allergies, infections, etc.) and warrant greater emphasis when assessing health risks in the context of climate change.

This work will focus on situations involving populations that are most at risk (particularly in relation to workplace exposure) and/or vulnerable due to particular sensitivities, or socio-economic determinants that are sources of social and environmental inequalities. It will also require efforts to develop air contamination assessment studies and improve their accessibility for expert appraisals and research. The relevance of foresight studies could be discussed with a view to estimating the health risks in the medium term.

Main challenges relating to physical agents

Assessing hazards and exposure to non-ionising radiation and its determinants is a subject surrounded by scientific and societal controversy that justifies the Agency's involvement. The development of technological innovations in different frequency ranges (digital communication technologies, etc.), with their rapid spread across all economic and social activities, raises questions about their effects on health (cognitive disorders, addictive behaviour, etc.) and the environment insofar as they constitute new sources of individual and collective exposure to electromagnetic fields, modify behaviour, and can induce indirect health effects as a result of their use (e.g. sedentary behaviour, accidents). Assessing these effects and the conditions of use and exposure, particularly in the context of the deployment of 5G, is an important issue for the Agency, especially in relation to situations of overexposure or vulnerable populations (children). The Agency will also continue to support the Cosmos-France study run by the International Agency for Research on Cancer (IARC), as part of the French contribution to the creation of a large cohort in order to collect data on exposure of the population to electromagnetic waves and on their health.

The extra-auditory effects of noise are becoming better known (diabetes, etc.) and justify the updating of the expert appraisal carried out by the Agency in 2013, with an update of the methodology for assessing effects, particularly those related to interactions with other exposure (chemicals). A debate should also be undertaken on changes in sources and modes of exposure to noise with a view to assessing the health impacts in light of specific territorial characteristics (typology of housing and its changes, social environment, etc.).

On the question of stereoscopic vision, work will continue on virtual and augmented reality, particularly through the use of virtual immersion headsets, both for domestic and professional use.

Main challenges relating to vectors

On 1 January 2018, the Agency was entrusted with the expert mission for risk assessment in the field of vectors and vector control (VC) for human, animal and plant health. A dedicated working group has been set up and ANSES has carried out some initial urgent expert appraisals on vector control in the context of a dengue epidemic on Réunion Island.

Assessing the effectiveness of VC strategies is an essential challenge for the Agency in a context of spatio-temporal extension of insect vectors of pathogens for humans, animals and plants, development of resistance of vectors to conventional biocidal treatments, preservation of biodiversity, benefit-risk balance of approaches integrating the various related issues, etc. This mission will entail the development of work on expert appraisals, methodological approaches and guides, coordination and monitoring, and information.

Continued support for research by the National Research Programme for Environmental and Occupational Health (PNR-EST) is essential to address challenges relating to knowledge.

4. Plant health and protection

Plant health and protection issues: what are the orientations for ANSES for the period 2019-2021?

This challenge is being addressed by two ANSES laboratories: the Plant Health Laboratory (LSV) and the Lyon Laboratory, and by three of the Agency's assessment and decision-making departments: the Risk Assessment Department (DER), the Regulated Products Assessment Department (DEPR) and the Market Authorisations Department (DAMM), which are all involved in the field of plant health and protection.

A. General points on context and internal organisation

France's agricultural and forestry plant health situation is affected more and more by the increased frequency and volume of world trade in plant products, the impacts of global climate change, and changes in farming practices and crop management techniques, particularly in the context of promoting the application of agro-ecology. Greater awareness of the corresponding issues has led to 2020 being declared the International Year of Plant Health by the United Nations General Assembly (https://www.ippc.int/en/iyph/)

In addition, changes to the regulatory context that primarily aim to promote the use of biocontrol products and reduce the number and quantity of plant protection products (PPPs) used, which are the consequence of growing concerns about the impact on health and the environment of treating crops, forests or non-agricultural areas with PPPs, also have a major impact on the emergence of new problems associated with harmful organisms.

Some of these factors may increase the risk of introducing new pathogens and pests into France, while others may potentially lead to the emergence or re-emergence of new plant health issues. It should also be emphasised that France possesses considerable overseas territories, which are ecologically fragile and particularly exposed.

With regard to the laboratories within the Research and Reference Division, the LSV carries out national reference (as the NRL) and research missions in plant health within its thematic and technical units (mycology, bacteriology, virology, GMOs, nematology, quarantine, entomology and invasive plants, pests and tropical pathogens) on phytopathogenic agents and pests (particularly quarantine pests), invasive plants, and on the detection of GMOs. The Lyon Laboratory studies the emergence and development of resistance to PPPs in plant pest populations through its Contracted Unit for Characterisation and Monitoring of Phenomena of Pesticide Resistance Development (CASPER USC) in partnership with INRA. In addition, part of the work of its Unit for Epidemiology and Support for Surveillance (EAS Unit) involves providing assistance with the development of activities relating to epidemiology and contributing to national surveillance in the area of plants.

Regarding the departments involved in expert appraisals for risk assessment, **the DER belongs to the Science for Expertise Division**. Its scope encompasses the work of the Expert Committee (CES) on "Biological risks for plant health", with scientific and technical support from the LSV, and the work of the Phytopharmacovigilance and Observatory of Pesticide Residues Unit (UPO), which manages a scheme for detecting and monitoring resistance and the adverse effects of PPPs on human health, fauna, flora and the environment (phytopharmacovigilance). **The DEPR, part of the Regulated Products Division,** assesses the hazards and risks to humans, animals or the environment, as well as the agronomic benefits, of PPPs and substances, fertilisers and growing media, and non-indigenous macro-organisms beneficial to plants that are introduced into the environment, in accordance with European and national regulations. Lastly, the **DAMM**, part of the Regulated Products Division, is responsible for marketing authorisations and permits (for parallel trade and experimentation) relating to PPPs, fertilisers, growing media and their adjuvants. It receives the application dossiers and reviews the draft decisions. It also manages declarations of product testing and experimentation, the operation of the Marketing Authorisations (MA) Monitoring Committee, and product control and inspection activities.

A comprehensive approach to plant health and protection, which involves studying pest interactions with the plant and its environment, therefore helps position the Agency's activities in the general health, economic and societal context. The Agency's mobilisation and active contribution will continue in Europe and internationally, whether in risk assessment, research and reference, or monitoring, surveillance and vigilance. It will be pursuing its involvement in the work of European and international institutions (mainly EFSA, ECHA, EPPO and IPPC), as well as with its counterparts and partners in Europe and elsewhere in the world (Canada, United States, the countries of the Maghreb, etc.).

B. Main outlook for 2020-2021 in plant health and protection

➢Plant health: from risk assessment to national surveillance

Three pests will receive particular attention in the current French plant health landscape: the *Xylella fastidiosa* bacterium, the bacterium responsible for yellow dragon disease (also known as huanglongbing (HLB)), and the pine nematode. With regard to insects, the *Bactrocera dorsalis* species complex has also been identified.

Assessment, ranking and anticipation of risks

Within the LSV's Expert Assessment of Biological Risks (ERB) Unit, which reports functionally to the DER, the formal requests that are planned give an indication of the major issues to come. These issues mainly concern forest woody species (*Phytophthora ramorum*, pine wood nematode: *Bursaphelenchus xylophilus*), fruit trees (leaf spot disease caused by *Alternaria* on apple trees) and ornamental trees (red palm weevil: *Rhynchophorus ferrugineus*, canker stain of plane trees: *Ceratocystis fimbriata platani*). Another area affected will be tropical and/or Mediterranean plants and crops, with the red palm weevil again, the huanglongbing bacterial disease of citrus fruit: *Candidatus Liberibacter* sp., and the emerging strain of the fungus responsible for Panama disease in banana crops (*Fusarium oxysporum* f. sp. *cubense* strain Tr4).

These assessments will encompass:

- very early-stage preventive approaches on quarantine pests;
- management strategies for trade flows of materials potentially posing a risk;
- and control strategies.

The plant pest ranking work that enabled the DGAL to categorise these pests into three health hazard categories required the design of an automated tool for identifying the necessary information within existing databases, websites and scientific documents, gathering it all in a new database and analysing it using a multicriteria approach in order to prioritise the pests. This tool (named BiOR2) and the associated data are also providing a ranked list of pests for the French overseas territories. The database will serve as a resource for analysing future plant health risks, anticipating unforeseen events and modelling invasions.

A new major orientation of our assessment mission will be the deployment of an approach to anticipate emerging risks, through participation in an EFSA-funded European research programme designed to conduct a prospective analysis by monitoring the media and scientific literature in order to identify new emerging plant pests. It will aim to identify relevant information on pests that could be a source of concern for the territory of the European Union.

Reference: integrating technological developments while preserving skills that have become rare

The LSV's reference mission will remain its structuring activity. To continue to respond promptly to the authorities' needs regarding biological monitoring of the country, including for emerging threats, and provide identification services to the agricultural profession more broadly, the LSV will:

- propose in-house or tailored methods;
- characterise them according to standards defined at the Agency (method validation guide) or at European level (EPPO);

- improve existing analytical methods by integrating technological innovations where necessary, particularly molecular innovations (NGS and third-generation sequencing, metabarcoding), to improve their performance (e.g. on new complex matrices) while optimising their cost;
- support the transfer of these methods to accredited laboratories as necessary. The corresponding methodological support could include kit validation.

However, analytical methods and identification tools using morphological or morphobiometric techniques (more specifically in nematology, entomology and weed science) will be promoted because:

- they have become rare in the national and European scientific landscape;
- in a more generic integrative taxonomy approach, they make it possible to validate pest sequences from the flow of interceptions or entries, in molecular databases.

In general, the LSV aims to ensure that the taxonomy skills used for its reference mission are maintained at a high level. It will confirm its ability to organise inter-laboratory proficiency tests (ILPTs) by continuing their international implementation, and to monitor the network of accredited French laboratories following recognition of its unique organisation obtained through the corresponding accreditation (ISO17043 standard).

In Europe, this period will see the continuation of the H2020 VALITEST project, coordinated by the LSV's Reference Coordination Unit (UCR), which will produce validation data through two series of diagnostic test validation studies, including different combinations of pests/plants/matrices.

In addition, 2020 will see our reference and analysis activities expanded within the framework of EURL mandates for fungi and oomycota, insects and mites, and nematodes.

Research: gaining visibility

The LSV's analytical capacity will be maintained at a high level while it participates in research and development programmes that will provide the reference mission with knowledge and innovations.

To achieve this, the research questions addressed in responses to calls for tenders for national (CASDAR) and international (H2020, PRIMA, ERA-NET EUPHRESCO) collaborative projects will concern:

- the biological characterisation and phylogeny of emerging pests or those considered to pose a risk;
- the study by molecular typing (MLSA, MLST) or sequencing (metabarcoding, WGS) of the genetic diversity, structure and adaptive potential of populations of these pests;
- the possible vector organisms of these pests and their geographical distribution.

In addition, due to its involvement in the "Epidemiology and surveillance" strategic theme, the LSV will develop its participation in the study of pest dispersion, for example by improving sampling techniques, characterising biological cycles and identifying factors determining the success of introduction and establishment.

Surveillance: contribution to surveillance schemes and active participation in the epidemiological surveillance platform for plant health

This concerns:

- national surveillance plans drawn up by the supervisory ministries;
- epidemiological monitoring carried out as part of projects with the production sectors;
- its contribution to the epidemiological surveillance platform for plant health (ESV) in conjunction with the Lyon Laboratory's EAS Unit. To kick off its activities, this platform will be aiming to improve official surveillance schemes, develop health reports based on surveillance data, establish monitoring of plant health hazards and improve the quality of surveillance data (a theme that cuts across the three epidemiological surveillance platforms). In addition to these cross-cutting themes, several working groups are looking to improve the surveillance of specific plant pathogens: *flavescense dorée* and vine wood diseases, the polyphagous bacterium *Xylella fastidiosa,* and the pine wood nematode. The Lyon Laboratory's EAS Unit will be involved in the cross-cutting support for this platform, meaning that ANSES will participate in its coordination;
- coordination of the LSV's in-house epidemiological surveillance working group.

Its most significant activities for the period 2020-21 will therefore include:

- validation by the LSV of updated or innovative analytical methods for identifying and characterising emerging pests;
- joint coordination of the platform by the Lyon Laboratory's EAS Unit;
- participation in and/or facilitation of the platform's working groups by both laboratories, as well as other Agency entities, in order to improve the specific surveillance schemes and provide cross-cutting expertise in surveillance engineering;
- research conducted to improve surveillance;
- expert opinions on the basis of formal requests in order to define certain surveillance plans via ad hoc recommendations.

This surveillance mission is also intended to evolve and innovate in terms of methodology and research questions. It will capitalise on the existing networks involved in plant health organisation (sectors, interprofessional organisations, FREDON and FDGDON, etc.) in order to alert the official services to the development of risks in the different geographical areas: Metropolitan France, EU Mediterranean countries, French overseas territories.

The surveillance mission may also concern the LSV and the Lyon Laboratory's EAS and CASPER units in the context of phytopharmacovigilance (PPV, see below) and the emergence of resistance to PPPs in pest populations.

Overall, expanding LSV missions and an evolving context for plant health

In addition to obtaining the three EURL mandates mentioned above, the activities of the LSV will also be impacted by the introduction of new standards such as the new version of ISO 17025, and new European regulations, which will (i) result in the French overseas territories being regarded as third countries in relation to the EU from the end of 2019, (ii) concern official controls on plants and their health status via Regulation (EU) 2017/625 and (iii) result in Regulation (EU) 2016/2031 being applied within the framework of the new Plant Health Act. The coming years will provide room for debate and the corresponding actions.

➢Plant protection: from the assessment of plant inputs to phytopharmacovigilance

Continual improvement in assessment methodologies for plant inputs

The challenges identified for the coming years in assessing plant inputs, both for synthetic PPPs and biocontrol products, lie in the production of knowledge and methods to ensure that a high level of protection of human health and the environment is maintained and that the solutions placed on the market are effective.

To achieve this, the scientists of the DEPR involved in assessing PPPs, fertilisers and growing media are participating in numerous studies aimed at developing or optimising assessment methodologies, particularly with regard to cumulative or "cocktail" effects. This work is most often undertaken in partnership with other organisations or in the framework of national, European or international working groups. Its purpose is not only to enhance the interpretation of assays used to determine chemical hazards, but also to construct detailed exposure scenarios and models used in assessing hypothetical risks and agricultural benefits (taking into account the resistance phenomena that have been identified or are liable to develop – see the section on phytopharmacovigilance). ANSES also funds specific studies to encourage the production of new knowledge needed for its expert appraisals.

In addition, the importation into France and release into the environment of any non-indigenous macro-organism beneficial to plants requires prior authorisation, issued on the basis of a dossier provided by the applicant, which should provide the information needed for a risk analysis. The LSV and the DEPR will continue to contribute to the development and interpretation of these risk analyses. The LSV will be in charge of examining applications for the importation into France of macro-organisms used in work carried out for scientific purposes in contained conditions without introduction into the environment. The DEPR will remain in charge of examining applications for the importation into France of macro-organisms for use in non-contained conditions.

Issuing of marketing authorisations: facilitate the submission of applications, optimise their processing and allow easier access to information

The Market Authorisations Department (DAMM), while ensuring that authorisations and permits are managed as closely as possible to the ever-changing national or EU regulatory requirements, will continue to implement processes and procedures to facilitate the various stages of managing a dossier, from start to finish.

This facilitation will take place in a context where the new conditions for re-approving some active substances and not renewing approval for others will lead to a restriction of the scope of authorisations, a strengthening of the conditions for use of products, and measures to protect human and animal health and the environment.

ANSES has introduced the management of applications in electronic format and made revised application forms available to holders, enabling dossiers to correspond more closely to the new requirements and optimising the submission and processing of applications. Forms for fertilisers and growing media will also be offered. The continuation of work on the D-Phy project for the digitisation of applications will eventually lead to simplified management.
An action plan to improve the timeliness of MA decisions was developed and implemented in 2017. The effects of these measures, particularly on the processing of the oldest applications and those relating to biocontrol, and on the simplification of processes, have now been noted.
An updated version of the dedicated website page now includes several notes specifying ANSES's management procedures, and changes to the E-Phy website will facilitate access to the products' characteristics and their conditions for use.

The MA Monitoring Committee, set up in late 2015, continues to support the General Directorate, particularly with regard to the management measures proposed in the decisions. It extended its remit to biocidal products in 2018, and also renewed its members in December 2018 for another three-year term.

Lastly, as part of the platform for dialogue with stakeholders set up by ANSES in late 2017, a monthly newsletter on MAs for plant protection products, posted on the website, has since December 2018 offered a summary of the main decisions taken by ANSES in a way that facilitates access to information. A bulletin devoted to fertilisers is expected to be launched before the end of 2019.

Characterisation and monitoring of resistance: aiming for more upstream anticipation through new technologies and more downstream integration in the agricultural and economic landscapes

The task of INRA's CASPER USC is to study emerging resistance phenomena in the main plant pests (fungi, insects, bacteria, weeds) to plant protection products. It helps establish and implement the DGAL's surveillance plans concerning the "Resistance" component of the monitoring of unintended effects (UEs) of plant protection products. It provides its expertise to risk assessors (examination of MA application dossiers for the DEPR) and managers (participation in the drafting of joint technical notes on "Resistance" with the DGAL, INRA and technical institutes). Its research on the mechanisms involved in resistance phenomena is mainly carried out with the partners of the four INRA units specialising in this field from the Pesticide Resistance Forum and Research (R4P) network. The CASPER Unit is mainly involved in the cross-cutting strategic themes "Plant health" and "Epidemiology and surveillance". Secondarily, scientific issues and those related to surveillance of the topics addressed may find points of convergence with the "Antibiotic resistance" strategic theme.

In a context where there are calls for a reduction in the quantity and diversity of authorised active substances, resistance of pests and diseases to plant protection products becomes a key issue: each treatment must be as effective as possible and its use reasoned in order to limit the evolutionary response of the target organisms. With this in mind, the Unit develops methods and tools for detecting resistance through both biological and molecular approaches. The scientific orientations of the CASPER USC for the period 2020-2021 will be:

- monitoring of emerging topics in relation to feedback from the field and in conjunction with the DGAL as part of the annual PPP resistance surveillance plan;
- adaptation of high-throughput sequencing methods for more accurate surveillance and monitoring of the development of resistance phenomena in pest populations;

- assessment of the cost (or lack thereof) of resistance in pest populations. This parameter is essential in terms of understanding and managing resistance phenomena in the field;
- studying the effects of landscape and cropping practices on changes in the occurrence and frequency of resistance in pest populations.

Phytopharmacovigilance: collect and analyse data, identify the health or environmental signals

Created under the French Act on the future of agriculture, food and forests, the phytopharmacovigilance (PPV) scheme is designed to collect data on adverse effects occurring following the use of PPPs and to identify any health or environmental signals among these data. The scheme's scope covers effects on humans, livestock animals including honeybees, cultivated plants, biodiversity, wildlife, water and soil, air quality and food. It enables the continual reporting of information for the benefit of risk assessment, the placing of PPPs on the market and the risk management missions performed by ANSES and its supervisory ministries.

The main source of information reporting is the network of partner surveillance and vigilance schemes. Some twenty partners regularly forward surveillance or vigilance data on adverse effects of PPPs. This network's contribution is supplemented by reports that can be sent directly to ANSES via a reporting portal on the ANSES website. Lastly, the scientific literature, along with the technical literature and the press, are another complementary source of information. These sources do not all yet fully meet the expectations of the PPV scheme, so efforts are needed to improve this.

Once the data have been collected or sent to ANSES, they are analysed to single out those regarded as health or environmental signals, on the basis of criteria relating to the seriousness of the effect, its causality regarding PPPs, and the risk of the effect's recurrence. ANSES still needs to consolidate the signal identification processes.

Lastly, ANSES can initiate ad hoc studies on the adverse effects of PPPs when the information is incomplete or to further examine a report on an adverse effect. In contrast to more open research questions, these studies should help answer specific questions and produce results that can be used quickly, for example to adapt the conditions of an MA or define cross-cutting management measures. These studies are funded through a tax paid by MA holders to ANSES on the revenue from sales of PPPs.

For the period 2019-2021, the Agency has adopted a strategy for phytopharmacovigilance, broken down into four areas, which will provide overall guidance for its work:

1/ Collect signals: focus on increasing the number of relevant signals sent by the network of partners that contribute to PPV;

2/ Consolidate signal characterisation and processing, and supplement these processes with the detection of emerging phenomena;

3/ Formulate summaries and recommendations on completion of the PPV analyses, and ensure they are adopted by all stakeholders;

4/ Continue consolidating the "Studies" component of PPV through implementation of the priority themes defined for the period 2018-2020:

- exposure of the general population to PPPs, particularly via ambient air, and of specifically exposed populations, for example residents in cultivated areas;
- exposure of agricultural workers to PPPs;
- the presence of PPPs in soil and the effects of PPPs on biodiversity;
- the effects of PPPs on bees and other pollinators.

5/ Enhance the "Reporting" of PPV actions to all stakeholders in France and encourage the emergence of similar mechanisms at the international level.

5. Occupational health

Background

Occupational health is in the spotlight now more than ever. The French National Assembly's Parliamentary Investigation Committee on occupational diseases and pathologies issued its report in July 2018 making several recommendations for improving the system of compensation for occupational diseases, improving the prevention system and supporting research. Along with the publication in late August 2018 of the report on the mission led by French MP Charlotte Lecocq on the evolution of the occupational risk prevention system and the report by Professor Paul Frimat on exposure to hazardous chemical agents, these various contributions will provide input for the discussions to be held between the government and the social partners on several subjects including occupational health. These discussions are likely to lead to significant, if not major, institutional changes. This provides the background to the orientations presented here, on the eve of the final year of implementation of the third Occupational Health Plan (2016-2020), in which ANSES is playing an active role. In a new approach compared to previous years, these orientations develop the main themes to be implemented on the topic of occupational health over the next three years, along with various actions that will be initiated or completed at the same time. They are based on the work programme sheets currently being finalised and are fully in line with the principles of ANSES's goals and performance contract (COP, 2018-2022).

Reinforce monitoring and vigilance work in order to anticipate emerging risks to workers as early as possible

The detection of emerging or re-emerging occupational health risks is a fundamental mission that relies on monitoring, research and vigilance work. Thus, while continuing its routine work in producing data and knowledge to support expert appraisal or developing tools for detecting emerging cases of new occupational diseases, the National Network for Monitoring and Prevention of Occupational Diseases (RNV3P) will hold discussions on optimising the scheme, taking better account of career histories, and developing the occupational exposure thesaurus. On this last point, ANSES is now coordinating a working group bringing together the network's regular partners, whose work will help harmonise the coding of occupational exposures in order to improve the interoperability of databases, particularly those set up and maintained routinely by occupational health services for their own needs. ANSES also manages or leads other vigilance schemes, such as toxicovigilance and phytopharmacovigilance (PPV), whose functions and collection methods differ but which are also used to identify emerging adverse effects on worker health. These vigilance data increasingly provide exposure information and reports of cases to supplement risk assessments. In accordance with the COP, work is being carried out to ensure the consistency and coordination of these vigilance schemes. It will help strengthen and improve each scheme's effectiveness in identifying relevant signals, particularly regarding the detection of emerging occupational diseases.

Contribute to improving risk control and prevention through the production of knowledge on hazards and exposure, and risk assessment

The production of knowledge on hazards and exposure, as well as the assessment of health risks, are central to the Agency's activities and expertise and are therefore key areas to be maintained in the coming years, especially in the field of occupational health. In line with the implementation of national plans and EU or French regulations on the assessment and management of chemical products, the Agency will provide scientific input to the authorities on the work described below.

First of all, the Agency will maintain a high level of support for the implementation of expert appraisals within a European regulatory framework **(CLP, REACh, PPPs, Biocides)**. Most of these regulations include a component on occupational exposure and risks. One of the Agency's major challenges regarding risks to workers is to identify substances to be assessed as a priority, in order to maximise the impact in terms of risk prevention and worker health protection. European work on exposure assessment and the development of technical standards due to advances in scientific knowledge will be monitored to ensure overall consistency and harmonisation of practices among the various regulations. This will be facilitated by the diversity of regulatory fields within the Agency's missions.

As part of the Second National Endocrine Disruptor Strategy (SNPE2), ANSES will define a method for prioritising **endocrine disruptors (EDs)** in order to establish a list of substances that have known, presumed, or suspected ED properties, after consultation with stakeholders. Management recommendations geared to the level of evidence will be put forward. ANSES will also continue to support the action of the PST3 to enhance knowledge of occupational exposure to endocrine disruptors.

Besides the ongoing expert appraisal on **nanomaterials** in food, which includes a component on occupational exposure, the Agency will continue its work to identify and characterise other industrial sectors that use them. Improving knowledge of uses of and exposure to nanomaterials has a direct impact on the Agency's ability to manage and exploit the mass of data it oversees through the R-Nano register. As the organisation responsible for managing the register, ANSES needs to quickly ensure that the quality and usefulness of the data contained in this database are assessed through detailed analyses and consultation with the various users. These data should also be used to document questions about emerging risks or specific industry sectors, linked for example to hazard alerts for certain substances or the increase in specific uses. Work on this subject has already begun but needs to be stepped up. Lastly, the Agency will provide scientific and technical support to the authorities on harmonising the definition of nanomaterials in EU regulations. It will continue work on the feasibility of developing health reference values for nanoscale forms (TiO2, etc.) and the assessment of substances in nanoscale form under REACh.

The identification and assessment of risks associated with **CMR** agents (carcinogens, mutagens and/or reprotoxic substances) will remain a major focus for the Agency, both as part of expert appraisals in response to formal requests and in the application of expertise to support chemical regulations (CLP, REACh, Biocides, PPPs, OELs). Besides a substance-by-substance approach, the objective and major challenge for the Agency in the coming years will be to develop new knowledge and robust methodologies to take into account the cocktail effects of chemicals, including CMRs. ANSES will have the opportunity to identify and test these scientific and methodological challenges in particular through the long-term study undertaken recently at the request of the Directorate General for Labour (DGT) to develop a method for classifying a mixture or process as "carcinogenic" under the 1993 Ministerial Order[15] and the drafting of a list of processes causing exposure to complex mixtures (e.g. those produced by welding fumes) that could be included in it. Following on from its expert appraisals on the identification and assessment of CMRs and its latest work to assess the benefits of formaldehyde regarding its use in certain industry sectors (pathological anatomy and cytology, embalming, etc.), the Agency will continue to work on **promoting substitution** and managing the substitution-cmr website. A thorough examination of the need for greater coordination of ANSES's various work on substitution of hazardous products (CMR, PPPs, biocides) is necessary. It is important both at national level, where the role and coordination of the various parties involved in prevention should be clarified, and also at European level, where the European Chemicals Agency wishes to work with the Member States on this subject. Discussions on this subject may take place within the framework of the PST3's Action 1.10 on substitution, which is being led by the Agency.

With the recent signature of a memorandum of understanding with the DGT specifying the signatories' role and tasks in implementing the work programme on occupational exposure limits, the Agency will continue its scientific expert appraisal work with a view to making recommendations for atmospheric **(OELs)** and biological **(BLVs)** limit values, as well as its contribution to European work (ECHA). The challenge for the Agency lies in identifying priorities regarding the substances to be assessed in order to maximise the impact of its expert appraisals in terms of protection and risk prevention. Furthermore, in the coming years it will be necessary to increase ANSES's ability to develop biological limit values, which will help in particular overcome the

[15] Ministerial Order of 5 January 1993 listing the carcinogenic substances, preparations and processes within the meaning of the second paragraph of Article R.231-56 of the French Labour Code

uncertainties associated with the inhalation exposure route alone. This work on occupational exposure limits will take place in conjunction with the European human biomonitoring project HBM4EU and the *Santé Publique France* project carried out as part of the "biomonitoring" sub-action of Action 1.10 of the PST3. Lastly, ANSES will consider the lessons to be learned from the results of the study conducted with ANACT and the INRS on exploring the conditions under which OELs are implemented.

The issue of **fibres, dust or particles** is a topic in which ANSES is particularly involved and on which it has produced a great deal of work in recent years. ANSES will continue devoting significant resources to this issue, besides the continuous production of methodological standards and the characterisation of particles in ambient air or workplace atmospheres. With regard to workers, the Agency will focus on studies to acquire knowledge on elongate mineral particles, for example, or on assessing the relevance of the particle size fractions used in "environmental health" and "occupational health" standards to characterise airborne particles. The publication of ANSES's expert appraisal on air pollution in underground railway areas has raised the question of the difference in risk management standards applied to the general population and to workers, the relevance and justification of this difference being increasingly challenged. This work will therefore enable the public authorities and social partners to consider the need to change the regulatory framework for risks to workers associated with dust and particles.

The Agency's work increasingly focuses on health effects related to **biological agents** or bioaerosols (e.g. mould), including a component on risks to workers. Recent work on the health impact of mould in buildings included a number of recommendations for prevention professionals. In addition, the conclusions and recommendations resulting from the Agency's work on risks to workers associated with climate change justify it devoting more attention to assessing the health risks of biological agents in the workplace in the coming years. It is all the more justified since scientific and technological developments related to the increasingly important role of biotechnology in our society raise questions about its consequences on the health of workers in this sector, a subject that is the focus of ongoing work at ANSES.

Assessing hazards and exposure to **electromagnetic fields** and their determinants is a subject still surrounded by scientific and societal controversy that justifies the Agency's continued involvement. Several expert reports have been published on the subject. These have highlighted growing concerns about exposure indicators and limit values, which are currently being reviewed by some international bodies. The Agency's experience and expertise on the subject argues for its involvement in the work, which could be carried out in association with other national or international bodies, with a view to adapting or developing exposure indicators that are relevant in view of the changes in uses and technologies, and proposing exposure limit values in line with the conclusions of the Agency's expert appraisals on the health effects of exposure to electromagnetic fields. This work also requires mapping the risks to workers associated with electromagnetic fields, which would help identify priorities for action. A formal request from the public authorities would enable ANSES to take on this work as a priority.

The extra-auditory effects of **noise** are becoming better known (diabetes, etc.) and may justify an update of the expert appraisal carried out by the Agency in 2013, especially on the methodology for assessing effects and in particular those related to interactions with other types of exposure (chemicals). The statistics on claims (accidents at work and occupational diseases) concerning hearing disorders among workers demonstrate the importance of developing knowledge and improving prevention in the workplace. A strong stance by the supervisory ministries through a formal request to the Agency would ensure that this work was given greater priority.

Lastly, ANSES will continue its work and discussions on the health risks associated with **organisational factors** by completing the second phase of its expert appraisal work on atypical working hours. It is clear that the development of new information and communication technologies and new forms of work organisation linked to the digitisation of the economy will lead to more knowledge and risk assessments being required as part of the public authorities' support for this development, which is liable to have harmful effects on worker health.

Continue developing complex expert appraisals involving multiple exposure situations in order to make progress on scientific and methodological issues

For the past few years, the Agency has had to conduct complex expert appraisals in occupational health related to a specific profession or industry sector, or to the particular ways in which work is organised. In this approach, the assessment of cumulative risks or **multiple exposure** is a central and recurring issue. Current approaches rarely integrate workers' exposure to different hazards at a wide range of exposure levels. However, numerous studies show that this represents the reality of almost all occupational situations. In late 2019, therefore, ANSES will publish the first phase of its work on health risks to workers associated with waste recycling activities. A debate was recently initiated on the occupational health of workers in the cleaning and sanitation sector. These workers are subject to multiple risk factors, whether physical, organisational, biological or chemical. In addition, their medical monitoring is complicated by the job itself, often involving multiple sites and multiple employers. This debate led to the drafting of an internal request in 2019, whose first phase consists in identifying situations or populations that need to be investigated in greater depth. In a similar vein and depending on available resources and government priorities on other subjects, the Agency will begin work on the issue of occupational risks in the livestock sector. Activities in this sector generate dust containing chemicals, involve exposure to biological agents that can be harmful to human health, and impose considerable physical and postural constraints, as well as irregular working hours. The question of multiple exposure is consequently a major challenge for all those working in the field of occupational health and prevention. A challenge firstly with regard to knowledge of exposure, and then a methodological challenge for risk assessment. Moreover, it is highly likely that in the future this question will extend beyond the occupational environment by mobilising the concept of the exposome. It should be added that, in this respect, this question also represents an opportunity for the Agency to promote and exploit the integration of its various spheres of competence. We therefore still have a great deal of scientific and methodological progress to make in this area and that is why **this topic has become central** to the Agency's approach to occupational health issues. It is also part of the PST3's Action 1.11[16] coordinated by the Agency.

Ensure successful implementation of the new mission on expert appraisal prior to creation or modification of occupational disease tables

The reform of the workings of the Special Commission on Occupational Diseases of the Steering Committee on Working Conditions (COCT) provides for the outsourcing of the expert appraisal phase prior to creating or modifying an occupational disease table, to ANSES or any other agency offering similar guarantees with regard to the independence and robustness of the expert appraisal. For the Agency, this means carrying out work that it already routinely conducts as part of its normal missions. For example, establishing the probability of a cause-and-effect relationship or documenting exposure in order to identify work involving exposure to a particular hazardous agent. However, given the medical nature of the part relating to designation of the disease in a table, ANSES's success in this field depends, among other things, on its ability to set up a multidisciplinary group of experts in which medical expertise will be consolidated. The implementation of high-quality, reliable, independent collective expert appraisal based on a robust and proven methodology should therefore help strengthen the scheme for recognising occupational diseases.

Strengthen the mobilisation and contribution of the human, social and economic sciences in expert appraisals relating to risks to workers

Assessing risks also requires the detailed characterisation of exposure, i.e. the **identification and understanding of its determinants**. It is therefore clear that an analysis of the actual work activity, closely linked to labour relations, economic imperatives, the organisation of production (subcontracting, etc.), the legal context and the wide variety of implicit and subjective representations, is necessary for a relevant assessment of uses and exposure, which are essential components of risk assessment. Consequently, in addition to "expology" (exposure assessment studies), turning to disciplines from the human and social sciences – such

[16] Action 1.11: Improve the way in which multiple exposure is taken into account and target certain occupational sectors that are particularly exposed to cumulative risks

as ergonomics, sociology, psychology – and considering socio-eco-demographic components is desirable, if not essential, in many cases. From the point of view of the company's socio-economic context, which also plays a part in current and future exposure conditions, a sector analysis is also necessary and could call on different economic trends (e.g. industrial economics, innovation economics, labour economics). An understanding and a detailed analysis of the behaviour of stakeholders – whether consumers, workers or companies – in the face of the applicable regulations, and the ability of public or private institutions to implement and enforce these regulations, are all necessary dimensions for understanding exposure situations and therefore identifying risk situations and possible means of preventing or reducing them. The Agency's efforts to mobilise disciplines in the human and social sciences (including economics) need to be supported and developed. The aim will be to identify, as clearly and as early as possible in the work to be carried out in the field of occupational health, the nature of the issues to be addressed and the skills to be mobilised to tackle them, as was the case, for example, with the preliminary work on cleaning activities.

Work for better planning, coordination and visibility of occupational health research in France

Under the National Research Programme for Environmental and Occupational Health (PNR-EST), the Agency will give prominence to actions to support and facilitate occupational health research, in order to develop the knowledge and skills needed for its risk assessment missions in the medium term. ANSES's goals and performance contract (COP) requires the Agency to ensure that it gives greater visibility at national, European and international level to research in occupational (and environmental) health. In addition, the objective of Action 3.14 of the PST, led by ANSES, is to continue standardising and reinforcing the strategic planning behind occupational health research, particularly by strengthening the coordinating role of the R31 and PNR-EST by consolidating their strategic planning. The Agency will therefore continue its discussions in this regard with the action's various partners and also with representatives of the major research funding programmes in France.

In the European arena, participation in the PEROSH[17] network for the promotion of occupational health research should also be studied. Lastly, the Agency is examining with interest Proposal 4 of the parliamentary investigation report on occupational diseases[18] and the report on the occupational health mission led by French MP Charlotte Lecocq to "create a national school of occupational health, bringing together and funding research on the consequences of exposure to occupational risks, in order to increase the visibility of occupational health research and facilitate the dissemination of knowledge." It will suggest raising the subject in this framework to the various partners of Action 3.14 of the PST3.

Strengthen European and international partnerships

ANSES has strengthened scientific exchanges with partners having similar functions, with whom it has established regular and close relationships. Some of these have been formalised by partnership agreements, whether in Europe with BAuA in Germany, RIVM, GR and TNO in the Netherlands[19], or in North America with NIOSH, INSPQ or IRSST[20]. These organisations are often consulted for contributions to expert appraisals, particularly on work undertaken or ongoing in the various countries. Relations with EU agencies (ECHA and EU-OSHA[21]) and international bodies such as the World Health Organisation (WHO) – particularly its Chemical Risk Assessment Network – should be continued, as well as participation in scientific networks such as MODERNET[22].

[17] Partnership for European Research in Occupational Safety and Health
[18] Report of the Parliamentary Investigation Committee on occupational diseases and pathologies in industry (chemical, psychosocial or physical risks) and the means to be deployed to eliminate them (National Assembly, July 2018)
[19] Federal Institute for Occupational Safety and Health (BAuA); National Institute for Public Health and the Environment (RIVM), Health Council of the Netherlands (GR), Netherlands Organisation for Applied Scientific Research (TNO)
[20] National Institute for Occupational Safety and Health (NIOSH), National Public Health Institute of Quebec (INSPQ), Robert-Sauvé Occupational Health and Safety Research Institute (IRSST)
[21] European Chemicals Agency (ECHA), European Agency for Safety and Health at Work (EU-OSHA)
[22] Monitoring Occupational Diseases and tracing new and Emerging Risks in a NETwork

III. Summary of the Work Programmes of the Scientific Divisions

1. *Research & Reference Division*
2. *Science for Expertise Division*
3. *Regulated Products Division*

1. Research & Reference Division

Introduction

ANSES's Research and Reference Division brings together nine of ANSES laboratories, along with the Strategy and Programmes Department, which is responsible for guiding 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, 12 European mandates and 26 international mandates were held by these laboratories in 2019; a 13th European mandate will be added in 2020 with the establishment of the new European Reference Centre for the welfare of poultry and other small farmed animals) and **research** activities, and **contribute to surveillance** in the areas of animal health and welfare, plant health and food safety. They also contribute to the **expert appraisal** work carried out by the Agency in these areas.

The **laboratory work programme** is drafted and proposed in the form of worksheets, which are discussed with the Agency's supervisory ministries. These sheets are now prepared once every two years and were therefore presented to the supervisory ministries in autumn 2018 for the period 2019-2020. They cover all the laboratories' reference, research, surveillance and expert appraisal activities, providing an overview of the path adopted by the various units, and can be used by managers for guidance, planning and dialogue with the supervisory ministries.

The purpose of this note is to highlight the main orientations and highlights for 2019 contained in these detailed sheets for the 2019-2020 laboratory work programme, organised according to the **six cross-cutting strategic themes** defined by the Agency (animal health and welfare; plant health; food safety; antibiotic resistance; epidemiology and surveillance; and finally exposure and toxicity of chemical contaminants). 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 between the laboratories' scientific units and with the risk assessment units, within their spheres of competence.

This note also presents the 2020 work programme of the Strategy and Programmes Department.

Strategy & Programmes Department

The Strategy and Programmes Department (DSP) is responsible for supervising construction of the scientific strategy of the Agency's laboratories for research, reference and surveillance in conjunction with the departments in charge of risk assessment and regulated products. It is also responsible for contributing to the implementation of this strategy through the coordination and management of cross-functional activities, with the support of the scientific directors. More particularly, 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 efficiency of systems and compliance with ethical standards while carrying out the work.

Efficiency

The process led by the DSP to **harmonise and consolidate the reference activities of the Agency's laboratories, with a view to improving their efficiency**, will continue in 2020, particularly through the coordination of an in-house working group tasked with proposing guidelines and tools for the convergence of reagent verification practices. Similarly, discussions will continue on the structuring of a vigilance scheme for reagents and diagnostic kits on the market ("reactovigilance"). The revision of the statistical guide for inter-laboratory proficiency tests (ILPTs) will also be finalised this year. A reference panel will again be organised in the coming year, in order to continue the dynamic of exchanging practices and experience between French laboratories responsible for reference activities at national (NRL) and European (EURL) levels, along with an in-house seminar for ILPT coordinators.

In 2020, with the support of the laboratories concerned, the DSP will also continue making proposals to decision-makers on **changes to the regulations on micro-organisms and toxins (MOT)** and adjustments in their implementation, in order to minimise the difficulties and inefficiencies currently encountered in research and reference activities.

The DSP will also focus on strengthening **sector-specific national management of various IT projects** common to the Agency's laboratories (information system for managing analytical data, information system for managing biological collections, etc.) in order to improve collective efficiency in the deployment and implementation of these tools. Work to **consolidate and streamline the internal processing of dossiers in conjunction with the Agency's other departments** will be pursued and completed (overhaul of the electronic workflow for examining letters of intent for laboratory projects, drafting of a procedure for processing expert appraisal requests from laboratories).

Major sector-specific projects

The coming year, 2020, will see continued implementation of the measures decided following the **collective audit of the scientific activities of the Agency's laboratories (ECSL)** conducted in 2016**,** as well as preparation of the information (expectations, benchmarks) needed for the next audit scheduled for 2021, with the aim of identifying with the High Council for Evaluation of Research and Higher Education (HCERES) to what extent the latter could conduct this audit.

One of the central actions resulting from the 2016 assessment, which should be continued in the long term, relates to **scientific coordination for each of the six cross-cutting strategic themes** (animal health and welfare, plant health, food safety, antibiotic resistance, epidemiology and surveillance, exposure and toxicity of chemical contaminants) promoted by the six scientific directors. This is intended to strengthen coordination and the search for synergies between the laboratories' scientific units and with the risk assessment units, by using incentives identified for each theme (seminars, funding of doctoral or post-doctoral students under co-supervision, etc.). More generally, the DSP will continue its efforts to facilitate coordination and foster closer scientific ties between the teams (some of which are currently very small) through larger and more coherent scientific groups and projects. For example, following the especially positive dynamic created by the first call issued in 2018, in September 2019 the DSP issued a second **internal call for expressions of interest in collaborative projects between Agency teams,** which will lead in early 2020 to the establishment and internal funding of cross-functional 18-month collaborative research projects between the Agency's laboratories and with the assessment units. The DSP will also continue its internal coordination of **parasitology** launched in September 2018, an inter-theme coordination initiative covering the fields of animal health, plant health and food safety.

In 2020, jointly with INRA, CIRAD and VetAgroSup, the DSP will 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. With the support of the HR Department, it will also finalise its work on improving our recruitment and monitoring processes for doctoral students.

Lastly, in 2020, the DSP will again 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 – and especially its laboratories – on subjects of importance to ANSES, the objective is to promote synergies and exchanges of information 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

In 2020, the DSP will continue to implement the **promotion and partner relations policy** formalised in 2019 to share or make available to public and private teams working on public health the research results, biological resources and data generated by the Agency's laboratories. The objective is to further the necessary development of health tools, while complying with ANSES's obligations of independence from private interests. In this respect, the DSP will further explore possibilities of partnerships with third-party structures (SATTs – accelerators of technology transfer) able to support policy implementation.

Lastly, work will continue in 2020 with the aim of proposing and deploying a shared strategy on the more widespread use of whole genome sequencing (**WGS**) in reference and surveillance activities. By adopting WGS and the associated innovative genomic techniques, the Agency will be able to carry out its diagnosis and surveillance activities faster, more efficiently and with increased robustness, in order to safeguard public health.

Communication and institutional relations

The DSP will continue to support the laboratories in **developing scientific and institutional partnerships** in an ever-changing context. It will oversee effective implementation of the framework partnership agreements signed with various research and technical organisations (INRA, CIRAD, Ifremer, ACTA, etc.) and propose new structural partnerships, with certain veterinary schools in particular.

The DSP, and more especially the six scientific directors, will support the laboratories as needed to move forward with **regional partnerships**, relying on our positioning in the various COMUEs and our laboratories' standing with the Regional Councils.

With regard to the **alliances** created at the initiative of the Ministry of Research, the DSP will maintain its participation in certain governance bodies of the AllEnvi Alliance, and will aim to consolidate its position in the Aviesan Health Alliance's bodies.

The process of **strengthening cooperation between NRLs and NRCs** will be pursued in conjunction with *Santé Publique France*, with the aim of further strengthening mutual knowledge and understanding, which is the basis for further cooperation, particularly in terms of contributing to the epidemiological surveillance of zoonoses. In particular, framework agreements to facilitate the exchange of biological materials and data will be finalised and deployed.

Europe and international

The five-year (2018-2022) EJP co-fund on One Health will continue in 2020. This partnership project, half of which is being funded by the European Commission, brings together 39 European human and animal health institutes from 19 different countries. It is being coordinated by ANSES and focuses on research in the areas of foodborne zoonoses, emerging risks and antimicrobial resistance. The DSP will continue to be closely involved in representing ANSES in the consortium within the Scientific Steering Board and coordinating our laboratories' mobilisation for the scientific activities undertaken within the EJP, in collaboration with the European and International Affairs Department (DAEI), which is coordinating the project.

Following on from the discussions launched in late 2018 regarding the future of the online journal **Euroreference**, the DSP, in partnership with the DAEI, will continue the debate initiated by ANSES with our European counterparts on the possibilities and opportunities to strengthen the **structuring of exchanges and synergies in reference activities at European level**.

In 2020, in conjunction with the DAEI, the DSP will continue the internal scientific coordination of laboratories with European and international reference mandates (OIE, FAO and WHO) in order to define common priorities, share experiences and standardise practices. The year will also be marked by consolidation of the EURL mandates for which work began in 2019 (foot-and-mouth disease and three plant health mandates), as well as the launch of the new EU Reference Centre (EURC) for the welfare of poultry and other small farmed animals. The DSP will help set up and manage the EURC, a centre that will mobilise the scientific and technical forces of the Ploufragan-Plouzané-Niort Laboratory.

Animal health and welfare theme

Animal health and welfare is an area of excellence of the Agency's laboratories and represents the essential potential of French reference and research in this field. Reference and research in animal health and welfare combine high-level scientific skills and technical equipment, animal models, field experience and expertise interfacing with the Agency's other entities responsible for risk assessment and veterinary medicinal products. This combination of skills and resources allows the Agency to be particularly responsive in supporting its supervisory ministries in the management of health crises. It enables ANSES to apply a comprehensive and systemic approach to issues of research and assessment in animal health and welfare, taking account of farming systems and their consequences on animals, on the health of professionals involved in animal production, on the safety of foods of animal origin, and on the specific health risk posed by antimicrobial resistance in veterinary medicine. It therefore provides the State with the science-based evidence that is essential for establishing and supporting the implementation of risk management measures in all these areas. 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 ANSES laboratories' 2020 work programme in the field of animal health and welfare intends to meet the scientific challenges of risk assessment and support for risk managers in the following areas:

- development of methods for detecting animal diseases for analytical reference, and methods for dispelling doubts, which can be used on farms;
- understanding the pathogenesis of zoonotic, regulated or emerging infectious animal diseases or those with a major economic impact on the production sectors;
- host-pathogen relationships and the study of the interspecies transmission barrier;
- prevention of animal diseases, particularly through vaccination approaches;
- improving animal welfare for the benefit of animal health.

Some examples of the planned 2020 implementation of these major strategic themes are highlighted here.

Strengthening our national and European positioning

The coming year will see the launch of the European Union Reference Centre for the welfare of poultry and other small farmed animals, which ANSES will be running with its Spanish, Italian and Danish partners. The European Commission's choice recognises the Agency's dedication to the welfare approach for animal health and the accompanying work carried out to build and renovate our experimental poultry welfare facility (under the Brittany CPER). Lastly, the appointment of our Niort Unit – jointly with GDS France – as the NRL for bovine viral diarrhoea will help with the implementation of France's first plan to combat this disease.

Activity in 2020 mainly characterised by the consequences of previous health events

Continuation of the activities of the major experimental programme for surveillance of **low pathogenic avian influenza** viruses, especially within the fattened duck sector, should enable the European Commission to use its findings in 2020 as input for its discussions on the scope of surveillance and the regulatory changes that should accompany it. Our teams are also involved in research programmes on the effectiveness of biosecurity measures and virus circulation modelling, among other things.

The sudden emergence of **African swine fever** (ASF) in Belgium in autumn 2018 has considerably influenced the direction of our research and reference activities, not to mention the risk assessments in this area. Our vaccinology research in this area has been supported by an internal cross-functional programme and work will continue on the detailed characterisation of an attenuated viral strain of ASF that can be used as a tool to identify protective factors in an oral vaccination model.

For **bluetongue**, besides the activity generated by our NRL mandate, which was extended in 2019, in 2020 we should be continuing research carried out as part of the European H2020 PaleBlu programme, especially on molecular mechanisms of the phenomenon of restricted replication of "atypical" bluetongue virus strains in cells from the *Culicoides* vector, on orbivirus-vector interactions and on antiviral strategies to combat orbiviruses.

The re-emergence in 2019 of outbreaks of **equine infectious anaemia** (EIA) underlines the importance of the molecular characterisation work on the EIA virus, which is expected to be the subject of a doctoral thesis in the next three years.

Lastly, our active participation in the scientific work of the EJP on One Health should help us validate a pan-viral chip for identifying emerging vector-borne diseases, and study the genetic diversity and evolution of the hepatitis E virus during chronic *in vivo* and *in vitro* infections. In addition, on the latter subject, a thesis on modelling the spread of the hepatitis E virus in the pig sector and assessing risk reduction strategies for humans will be defended as part of an "additional training through research" project supported by the Ministry of Agriculture.

Continuation of new work of major interest

Besides the ambitious real-estate plans for the reconstruction of our Lyon Laboratory, our positioning within the animal health research community should be further strengthened by the **creation of the thematic research network for animal health in the Auvergne-Rhône-Alpes region** (SAARA) with our partners at INRA and VetAgroSup. A wildlife virology unit is expected to be set up in 2020 in partnership with the Nancy Laboratory for Rabies and Wildlife and the Lyon Animal Health units.

This coming year will also see the continuation of our work on tick-borne diseases and the interaction of these arthropod vectors with the many pathogens they host.

In the field of bee health, 2020 will see the continuation of two ambitious projects on the **complex interactions between the different stress factors affecting honeybees** (PoshBee, H2020 programme) and on the comparison of results from European and American bee health surveillance systems (the "Our planet for bees" project under the "Make Our Planet Great Again" call for projects).

Our animal health epidemiology work will focus on modelling the spread of diseases in order to better prevent them or limit their consequences. ASF, avian influenza, tuberculosis and brucellosis will be among our main research topics.

Lastly, in the field of surveillance and subject to availability of resources within the ESA Platform, national surveillance of bee mortality (OMAA observatory and winter mortality) will be relaunched and the OMAR (observatory for livestock mortality) network will be consolidated with a view to gradually covering most of the country, which will nevertheless require a few years to become fully operational.

Plant health theme

The increased frequency, volume and diversity of world trade in plant products, the impacts of global climate change, changes in farming practices and crop management techniques, the consequences of growing concerns about plant protection products (PPPs) and, more generally, changes in the plant health context are contributing to the emergence of new issues associated with plant pests. Several of these factors may increase the risks of their introduction into France and in some cases may lead to their emergence or re-emergence, whether in metropolitan France or in the overseas territories.

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

- the Plant Health Laboratory (LSV), whose six thematic and technical units (Bacteriology, Virology & GMOs; Nematology; Mycology; Quarantine; Entomology & Invasive Plants; Pests & Tropical Pathogens) study biological risks to plant health – including invasive plants – in cultivated, forest and natural environments. Two other cross-functional units are in charge of coordinating respectively the Laboratory's analysis and reference activities (reference coordination unit) and its expert appraisal and risk assessment mission for all groups of pests (expert appraisal on biological risks). The LSV's scope also covers organisms that are beneficial to plant health, the detection and identification of GMOs and the quarantine of plants introduced under import regulation waivers.
- the Lyon Laboratory, which studies resistance to PPPs through its Contracted Unit for Characterisation and Monitoring of Phenomena of Pesticide Resistance Development (CASPER USC) in partnership with INRA, and assists with epidemiology and national surveillance through its Epidemiology and Surveillance Support (EAS) Unit.

The work programme of ANSES's laboratories therefore offers a comprehensive approach to plant health and protection, which:

- involves studying pest interactions with the plant and its environment;
- mobilises expertise while interfacing with the Agency's other entities responsible for assessing biological risks to plant health and PPPs;
- and considers the Agency's activities in the health, economic and societal context.

Major health issues identified, studied and anticipated

Three pests will receive particular attention in the current French plant health landscape: the *Xylella fastidiosa* bacterium, the bacterium responsible for yellow dragon disease (also known as huanglongbing (HLB)), and the pine nematode. With regard to insects, the most recent detections also mean that primary importance will be paid to the *Bactrocera dorsalis* species complex and the risk level identified in Europe for *Popillia japonica*.

As part of the analysis activities related to its **reference mission**, the LSV plans to continue extending accreditations and their scope with regard to surveillance issues (integrating real-time PCR detection methods, broadening the flexible scope for GMO detection, developing generic methods for the morphological identification of certain insect groups). This is in addition to the continuing transition from ISO 17025:2005 to ISO 17025:2017, and the recent obtaining of ISO 17043 accreditation for inter-laboratory testing.

Transfer to the accredited laboratories of official analyses for detecting pests in new matrices will be effective (pine wood nematode in its insect vector) or planned (*X. fastidiosa* in its insect vectors). Lastly, the LSV will continue to develop and publish analytical methods to address the priority needs of the French overseas territories (pineapple wilt virus complex, HLB, *Ralstonia solanacearum* species complex (RSSC)).

To **improve the surveillance system's performance**, it will also be necessary to develop existing methods into more efficient molecular techniques (*Xylella fastidiosa*) at an affordable cost while supporting the accredited laboratories by organising training and method transfer. Internal methods will be improved – for potatoes and fruit tree viruses in particular – mainly on the basis of the results of the research projects in which the Laboratory participates.

Both in parallel with and upstream of surveillance, monitoring is also becoming an important issue, with a particular focus on developing methodologies for potential invasive plants. Furthermore, as part of EFSA's horizon-scanning exercise, the media and scientific literature will continue to be monitored with a view to the early identification of new emerging plant pathogens or pests. The project will aim to identify relevant information on plant pests in the European Union. Lastly, and this time downstream, consolidation of surveillance databases will focus on bacterial pests (*Xylella fastidiosa*, *Candidatus Liberibacter solanacearum*) and PPP-resistant populations.

Research activities will sustain this momentum in interaction with reference activities, since our competence and work in diagnosis will be maintained and strengthened to anticipate emerging issues by integrating methods from our work on pests or their vectors (development of a method for identifying *Xylella fastidiosa* vectors), as well as on detection techniques (multi-purpose PCR tests, HTS) and detecting resistance to PPPs (PCR tests). They will also allow us to study other major identified pests in greater depth: *Alternaria* and *Venturia* emerging pathogens of apple trees, *Phytophthora ramorum* in the wild in Brittany, neotropical species of regulated insect pests of potato crops, the American polyphagous moth *Spodoptera frugiperda*. In Europe, deployment of the H2020 VALITEST project, coordinated by the LSV, will continue with a second wave of inter-laboratory tests on different combinations of pests/plants/matrices. This project is designed to produce validation data through two series of diagnostic test validation studies.

New this year will be the Agency-wide launch of cross-functional collaborative projects involving several Agency laboratories or departments under the aegis of the Strategy and Programmes Department. The LSV is leading a project to characterise the pineapple wilt virus complex and is involved in another project to assess third-generation sequencing technology for identifying viruses, bacteria, fungi and GMOs.

Training through research, with the hosting and supervision of doctoral students, will continue to a significant degree in 2020. We will continue our work on several of the highest risk pests as part of 10 ongoing theses, including the use of new detection and characterisation tools, the study of the pests' genetic diversity, epidemiology and vectors, and the mechanisms for emergence of PPP resistance (fungicides, insecticides and herbicides).

Technological and methodological innovations currently being integrated

Next-generation sequencing (NGS) approaches will be in the front line in the fight against numerous pathogens (viruses, viroids and phytoplasmas). For GMOs, a study of methods for **detecting new breeding techniques** (NBTs) will be launched, while a programme will be conducted to detect and characterise GMO events without prior knowledge using new HTS technologies such as Illumina and MinIon.
These technical innovations in NGS are also intended to improve post-entry plant quarantine (diagnosis and detection) and to detect resistance to herbicides in invasive plants.

Similarly, an analysis will be conducted on the value of **digital PCR** in improving the performance of the surveillance system and of metabarcoding for characterising the above-mentioned pests, as well as tropical bacteria and nematodes that could become established in Europe.

Greater number and diversity of partnerships with all our missions

The coming year will see our reference and analysis activities expanded within the framework of **EURL mandates for fungi and oomycota, insects and mites, and nematodes**. **These last two mandates will be carried out** as part of a consortium with our Austrian (AGES[23]) and Belgian (ILVO[24]) partners respectively. This will lead to inter-laboratory tests being set up as needed by the European Commission.
At the same time, the LSV will continue to promote its methods at European level (EPPO panels; H2020 projects).

In terms of research, following the creation of INRA's CASPER USC in 2019, the **LaBex ARBRE** laboratory of excellence, which has been funded since 2012 as part of a future investment programme and which was recently joined by the LSV, will benefit from the Agency's contribution. In addition, the **NEMALLIANCE cluster**, created this year with INRA Le Rheu Brittany-Normandy to focus on nematodes, will become fully operational. At the same time, epidemiology and surveillance work on the *Ralstonia solanacearum* species complex (RSSC) will help get off the ground the **network of players identified by the Ralstotracing project in the countries and regions of the South-West Indian Ocean** (Comoros, Mauritius, Mayotte, Seychelles, Madagascar and Réunion) and East Africa (Kenya, Uganda, Tanzania). Another essential partnership is the one set up via the **R4P network** (Pesticide Resistance Forum and Research), made up of employees from

[23] Austrian Agency for Health and Food Safety
[24] Flanders Research Institute for Agriculture, Fisheries and Food

four INRA laboratories (Avignon, Bordeaux, Dijon and Versailles-Grignon) and an expert from the DGAL. A collaboration project on Lso with **NARO**[25] (Japan) is planned for our work in phytoplasmology.

Lastly, a major event this year will be the full deployment of the **epidemiological surveillance platform for plant health**, supported by the DGAL, INRA, FREDON, ACTA and the Chambers of Agriculture. The Lyon Laboratory's EAS Unit will be offering cross-cutting support for this platform, which was launched in 2019. ANSES will contribute to its coordination and lead the platform's working groups, mainly on schemes for monitoring regulated or emerging pests and on methodological work (health monitoring, health assessments, data quality, etc.).

Cross-cutting support within the Agency will also be provided in plant health epidemiology and surveillance, and related research activities will be carried out in partnership with the LSV, Risk Assessment Department and the CASPER USC. The Agency will also be involved in monitoring emerging resistance to PPPs, within the framework of the CASPER USC's participation in the DGAL's Resistance monitoring plan.

Food safety theme

Reference: analytical developments that benefit the performance and responsiveness of official controls and optimised surveillance of the food chain

The exercise of **ANSES's reference mandates remains an essential mission** in food safety, and provides an effective and reliable analytical arsenal for official food controls. In 2020, ANSES will therefore continue its **reference activities** for the competent authorities under the obligations of the new Regulation (EC) No 2017/625.

The aim with these reference activities is to rapidly move towards the integration of whole genome sequencing technologies in the coming years, enabling the Agency to be more responsive in the treatment and prevention of foodborne diseases. Indeed, real-time comparison of the genome of strains from food and animals with the genome of strains isolated from human diseases should enable us to identify food sources of foodborne diseases more quickly. Close consultation between our National Reference Laboratories and their human health counterparts (National Reference Centres) should help us better coordinate our activities.

The coming year will see the gradual transition from our conventional *Salmonella* serotyping activity to an automated molecular serotyping method. Similarly, the coordination of our research, reference and surveillance activities (*Salmonella* network) on this bacterium will be reviewed in order to optimise them.

Lastly, the **Central Veterinary Laboratory (LCSV)** in Maisons-Alfort remains the first-line official analysis laboratory for several French *départements* (75, 91, 92, 93 and 94) and will discuss a new agreement with the authorities (the DGAL and Paris Police Prefecture) binding them to ANSES, in order to continue supporting the public authorities in the investigation of foodborne illness outbreaks.

Research in step with risk assessment

- Cross-cutting aspects and analytical platforms

Research at ANSES is **necessary for risk assessment but also for risk management** by the public authorities: partly bound to the reference missions (development of high-throughput platforms, use of genomic techniques, etc.), research ensures the constant development of optimised hazard identification techniques that contribute to the quality of controls and, beyond that, to the acquisition of data on hazards for food risk assessment. Research on hazards also contributes to the collection of data on their characterisation, particularly the determinants of their pathogenicity, toxicological data, developments in antimicrobial resistance phenomena and their mechanisms, and host-pathogen relationships.

[25] National Agriculture and Food Research Organization

In 2020, predictive epidemiological surveillance will be implemented with the IOCAP project (optimised identification of *Salmonella* clusters isolated in the food chain – proof of concept), whose objective is to assess the effectiveness of the preventive measures implemented by the team coordinating the *Salmonella* network, based on use of a recently deployed R-shiny application, combined with in-depth characterisation by sequencing of a targeted panel of *Salmonella* strains. This programme is part of the national process to set up and optimise the national health monitoring platform for the food chain (PtF SCA).

The Water Microbiology Unit at the Nancy Laboratory for Hydrology will continue to develop its know-how within the **MALDI-TOF platform** in order to offer its assistance in detection and characterisation to all the ANSES laboratories. Moreover, it will be modernised in 2020 to enable it to continue providing essential support to all our research teams.

- Highlights for each field

For chemical risks in food (excluding water), reference should be made to the supplementary exposure-toxicology sheet.

In the field of microbiology, the projects carried out by our researchers in both bacteriology and food virology as part of the EJP on One Health will take our research to the European level.

In response to a request from EFSA, ANSES will continue its work, with the active support of the DEPR, to **characterise *B. thuringiensis* (Bt) strains** isolated from foodborne illness outbreaks for comparison with commercial biocontrol strains. In this regard, the DGAL has requested an exploratory surveillance/control plan for 2020.

The coming year will also see strong growth in our research work on interactions between intestinal microbiota and the carriage of foodborne zoonotic pathogenic bacteria by animals. These aspects should be reinforced by the introduction of metabolomics studies in partnership with the brand new CNAM national agri-food chair, which was set up this year in Brittany in close partnership with our Ploufragan-Plouzané-Niort Laboratory.

Lastly, work carried out in conjunction with the **food production sectors (seafood, poultry and pig sectors), including research on methods for controlling pathogens and improving products**, will remain major strengths for the Agency. Some of these challenges will be addressed in the strategic MARCO project ("Marine and coastal research in Côte d'Opale: from environments to resources, uses and the quality of aquatic products"), a 2015-2020 State-Region plan contract (CPER).

Antibiotic resistance theme

With regard to this cross-cutting strategic theme, 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 with regard to situations of particular importance to humans (cephalosporins, fluoroquinolones, colistin, carbapenems, etc.);
- **molecular characterisation of** antimicrobial resistance genes and genetic carriers and their dissemination in these same sectors, also in comparison with similar data in humans from a One Health perspective;
- monitoring **animal exposure to antibiotics** through sales monitoring or surveys (carried out by the ANMV) and the **associated impacts** in the context of various experimental models of *in vitro* or *in vivo* studies.

In 2020, these three tasks will be addressed by the four ANSES laboratories involved in this topic (Fougères, Lyon, Laboratory for Food Safety, Ploufragan-Plouzané-Niort) in close alignment with the activities of the ANMV. In particular, ANSES is heavily involved in the operational implementation of the objectives of the EcoAntibio plans (2012-2016; 2017-2021).

These laboratories will continue to carry out European regulatory analyses as part of the NRL's activities **(Directive 2013/652/EU**). In 2020 this will specifically relate to antimicrobial resistance of the bacterial species *Campylobacter*, *Escherichia coli* and *Salmonella* in the poultry sector, especially *E. coli* and *Salmonella* (in chickens, layer hens and turkeys) at the slaughterhouse when arriving (caeca) and leaving (meat). At the same time, the Agency will continue to operate and consolidate the other antimicrobial resistance surveillance schemes (mainly the **RESAPATH** network, which is the focus of **Theme 3, Action 14 of the EcoAntibio 2 plan**, and the **Vigimyc** network for mycoplasmas). Several national projects are planned for the RESAPATH network in 2020. Some will result from research work carried out as part of an FCPR-funded thesis (Clémence Bourély, defended on 5 September 2019), and others from structural changes in the network aimed at optimising data flows (EDIR Project, EcoAntibio) or allowing online consultation (R-Shiny) of collected data. In addition, a Bayesian approach will be adopted to model RESAPATH data in order to characterise changes in the sensitivity of *Escherichia coli* clinical isolates to colistin (COBAYE Project, EcoAntibio).

Long-term monitoring of antimicrobial resistance will in 2020 be supplemented by the implementation or completion of **specific surveys in project mode** (surveillance in fish farming, in the marine environment or in veterinary hospitals, antibiotic resistance of mycoplasma, carriage of methicillin-resistant *Staphylococcus aureus* in pigs, resistance to colistin, etc.). More generally, these antibiotic resistance surveillance data are of great help in assessing the effectiveness of public policies on the use of veterinary antibiotics in France. They will continue to be compared with data from human medicine as identified in the Interministerial Roadmap adopted in November 2016.

In terms of **methodology**, in 2020, the Agency will pursue several actions to further improve surveillance of antimicrobial resistance. They include developing, assessing and validating phenotypic methods for determining susceptibility to antibiotics (IMPART project within the framework of the EJP on One Health; iMMUNOCOLITEST project, EcoAntibio), updating 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, and developing/standardising methods for determining susceptibility to antibiotics of different bacterial species (*Aeromonas*, *Vibrio*, *Brachyspira*, *E. cecorum*, etc.) (BrachyMIC project, CoVetLab; several EcoAntibio projects) selected for their clinical or epidemiological importance or lack of study methods.

At European and international level, **the European Joint Action EU-JAMRAI**, which began in September 2017 will be completed in 2020 (see https://eu-jamrai.eu/). ANSES, on the basis of its expertise in coordinating the RESAPATH network, was given the task of reviewing the various surveillance systems that currently exist in veterinary medicine within Europe and then studying the feasibility of longer-term generation of European data (Action 39 of the Interministerial Roadmap). Also in 2020, the Agency will continue contributing to international epidemiological surveillance of antimicrobial resistance and the establishment of methodological standards, through the validation of a work programme to support the FAO within the framework of the recently awarded **Reference Centre** mandate, which will shortly be officially announced.

The laboratories will continue their work on **molecular characterisation of the resistome** and of genetic carriers of antimicrobial resistance determinants in different environments. As such, the Agency is involved in several research projects funded by the EcoAntibio 1 and 2 plans, which will be completed (EcoAntibio 1) or initiated (EcoAntibio 2) in 2020. This work will also be carried out as part of European or international projects such as TransComp-EST, the Joint Programming Initiative (JPIAMR); ARDIG and MEDVETKLEBS, under the European Joint Programme on "One Health, etc. 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 (INRA, Inserm, *Santé Publique France*, *Institut Pasteur*, other institutes in Europe, etc.), as part of an integrated approach. Especially in France, from 2020 the ANSES laboratories will contribute to the One Health strategy on research on how to tackle antimicrobial resistance currently being developed (**Priority Research Programme**).

In connection with the ANMV's activities, the laboratories will help refine quantification of animal exposure to antibiotics through surveys on use (ongoing and/or as part of the EcoAntibio 2 plan). Work will also be carried out to assess, through experimental approaches and/or overall molecular analyses (metagenomics, for example), the impact of antibiotic use or biocidal treatment on the microbiome, on the emergence of cross-resistance mechanisms and on the overall microbial ecology of ecosystems (METARes, STAFILMS, CANIBIOTE, EcoAntibio projects). As a follow-up to the ANSES report on alternatives to antibiotics published in April 2018, **work in 2020** will also focus on the relevance of credible alternatives to antibiotics (bacteriocins, algal hydrolysates, pre- and probiotics, phage therapy, vaccines) (RESPEC, CANIPHAGE, EVASION, EcoAntibio projects).

Lastly, the laboratories are developing work on the subject of antimicrobial resistance in conjunction with **other specialist ANSES divisions** or **disciplinary fields** other than those usually covered. The **Risk Assessment Department** began work in 2018 to respond to a formal request on the risks of antimicrobial resistance related to the environment. This includes a contribution by ANSES's laboratories and its findings will be published in 2020. As part of ANSES's "Cross-functional" calls for expressions of interest led by the DSP, a project involving the laboratories and the **Regulated Products Assessment Department** will be completed in 2020 and will provide quantitative data on the development of antibiotic resistance in *Salmonella* after cleaning and disinfection of fattening facilities (QESABIO project). Also in 2020, a trans-disciplinary three-year doctoral study will be launched combining the contribution of 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.

Epidemiology and surveillance theme

The ANSES units working in epidemiology:

- provide scientific and technical support to the supervisory authorities, partner organisations and ANSES's risk assessment departments, in particular on Category 1 health hazards;
- participate in coordinating several surveillance schemes (RESAPATH, Vigimyc, *Salmonella*, RNOEA, Resumeq, foot-and-mouth disease rapid-response unit);
- provide support to the Agency's National Reference Laboratories, enabling them to carry out their tasks of collecting, processing, facilitating access, 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 coordination teams, operational teams and working groups;
- conduct their own research activities.

In 2020, they will again offer major scientific and technical support to the supervisory authorities and carry out key research on Category 1 diseases such as avian influenza, African swine fever (ASF) and porcine epidemic diarrhoea. In addition to this very important groundwork, ANSES's main orientations and significant epidemiological work for 2020 will focus on tick-borne diseases, better consideration of the wildlife compartment, methodological research and an analysis of alternative livestock farming systems.

Tick-borne diseases

Several risk-modelling studies related to health hazards determined by environmental factors will be initiated or continued. For example, predictive mapping of the risk of tick-borne encephalitis in France will be further developed, with an analysis of the environmental and biotic factors associated with the presence of ticks and the virus. Models will be developed to assess the risk of tick bites in urban and suburban areas or during recreational activities in forests, in order to improve forecasting, and management and treatment measures.

Better consideration of the wildlife compartment

The wildlife compartment plays a key role in the emergence, perpetuation or resurgence of many animal and/or human diseases. The coming year will be an opportunity to conduct several descriptive epidemiological studies to update knowledge on different infections in wildlife, such as those caused by *M. bovis* in badgers or *E. multilocularis* in foxes, with a view to improving their surveillance. Several modelling studies will explore the spread of pathogens in wild populations, whether ASF in wild boars and the role of the wildlife-domestic fauna interface, or the involvement of birds in the circulation of Lyme disease in France.

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. With this in mind, the European MOOD project will provide innovative tools to help in the early detection, assessment and monitoring of health hazards in Europe. The impact of definitions of spatial and temporal units on the results from models used in syndromic surveillance will also be explored as part of a thesis in collaboration with *Santé Publique France*. Lastly, in connection with the expansion of high-throughput sequencing technologies, a study will focus on the integration of molecular epidemiology data into epidemiological models, based on the example of bovine tuberculosis.

Analysis of alternative livestock farming systems

Criticisms of the livestock sector, and industrial livestock farming in particular, are becoming more and more frequent. Alternative livestock systems are developing, aiming to reconcile production and societal expectations. In this context, several studies on the theme "rethinking livestock farming" will aim to explore alternative poultry and pig farming systems and their consequences in terms of animal health and welfare, as well as biosecurity in livestock farming in the face of major health threats.

Exposure to and toxicology of chemical contaminants theme

The purpose of the "Exposure and Toxicology" cross-functional theme is to coordinate and facilitate collaboration between the Agency's three core divisions on chemicals of anthropogenic or natural origin that could contaminate food and contribute to the chemical exposome of our fellow citizens. The aim is to develop this area of excellence for the Agency in order to contribute to an integrative toxicological risk strategy capable of detecting, characterising, assessing and monitoring these public health hazards through a systemic approach. The major challenges identified relate to the acquisition of knowledge on several hazard classes for which the ANSES laboratories hold reference mandates, the acquisition of high-quality data for monitoring these hazards, and the preparation of research with our scientific partners to develop hazard analysis and characterisation methods with which to address issues of multiple exposure and assessment of the risks associated with mixtures.

- In terms of **food safety**, **reference** activities will focus on developing analytical methods for the surveillance and control of **residues of veterinary drugs** and **plant protection products**, and the detection of **trace metals** (inorganic arsenic), **paralytic toxins** and **biogenic amines**. In the area of water, new **non-standard methods** for explosives residues, chlorination by-products and pesticide metabolites are being developed to estimate their occurrence and assess the relevance of future surveillance. In animal nutrition, antibiotic screening methods are being developed. In each field, the laboratories will organise several inter-laboratory proficiency tests using the new LEILA internet platform deployed by ANSES. The **quality of data** from control and surveillance activities has been improved to provide data that can be used by risk assessors and to support risk managers. The laboratories will contribute to measures initiated as part of the **surveillance platform for food-chain safety** and the ranking of hazards.

- In terms of research, several projects are being launched to improve understanding of the fate of **fluoroquinolone** residues in poultry feathers and the risk associated with their recycling in animal feed. A research programme on the transfer of antibiotics into milk will be initiated. A study of the impact of

bullets on **lead contamination** of game will be launched. The formation of **natural metal nanoparticles** in fish will be studied as part of an international thesis. Research carried out with the CEA on the characterisation of **TiO2 nanoparticles** is in the exploitation phase, as is work on **metabolism of dyes in fish**. The study of the **distribution of chlordecone** in contaminated cattle will be continued. **New analytical approaches** based on high-resolution spectrometry are being assessed for the **multi-class screening** of veterinary medicinal products and plant protection products, or the **screening of emerging substances** in water. The laboratories are working with the Risk Assessment Department to prepare the next Total Diet Study. Methods for detecting non-regulated toxins, screening for **pesticide adjuvants in water** and analysing **dithiocarbamate residues** are also currently being developed. In the field of **toxins**, the Fougères and Maisons-Alfort teams are working together to develop directed analysis using cell screening and high-resolution mass spectrometry analysis to elucidate food poisoning. The first phases of the research programme on the contribution of **deoxynivalenol** to the development of **metabolic diseases** will be carried out.

Research partnerships and analytical developments on microplastics in seafood products are taking shape at national and European level. In terms of hazard characterisation, new 3D cellular models (organoids) are being developed to study the hepatic or intestinal toxicity of contaminants and to characterise the absorption and metabolism steps. This work is being carried out in parallel with the development of computer tools for analysing interactions on kinetic processes and extrapolation from *in vitro* to *in vivo*. All our work will contribute to the development of a strategy to integrate these methods in risk assessments. As part of these approaches, ANSES will contribute to the standardisation of tests and the study of their relevance in risk assessment in the context of H2020 projects (Oberon, Riskgone).

2. Science for Expertise Division

In line with the strategic orientations by thematic area for the 2019-2021 three-year cycle on the one hand, and the four strategic themes of the 2018-2022 Goals and Performance Contract (COP) on the other, the work programme of the Science for Expertise Division is based on a set of worksheets drafted by its entities (drawing on cross-functional links within the Agency), in conjunction with its supervisory ministries and external partners. This summary documents the teams' commitment to health and safety. Without being exhaustive, it gives some perspective to major actions that contribute respectively to increasing the efficiency and scientific robustness of ANSES's work, advancing major projects in the various specialist areas, preparing and supporting developments in response to health and societal challenges, enhancing institutional communication, and integrating the Agency's work at European and international level. The choices have been made for their illustrative nature, as the Division's work is the result of the entire programme. In addition, for the communication and international parts, they concern the Division's contribution to ANSES's overall work in these areas.

1. Improving efficiency and increasing the robustness of our work

By its very nature, improving the efficiency (COP Theme 5) or robustness (through scientific excellence, quality, independence – COP Theme 1) of our work relies on the contribution of a broad range of activities, measured by aggregate indicators. This is the case, for example, with improving compliance with contractual deadlines for formal requests (indicators 5.3.2 a/b/c of the COP), or the robustness of the process for analysing personal links of the members of our expert groups (indicator 1.1 of the COP on updating, which was 97.8% in 2018). With regard to the first point, it is worth mentioning the **working group led by the DGAL, which began work in autumn 2019 on the regulation of formal requests**. This will contribute to the quality of dialogue and to greater visibility on changes in processing times, which result from changes in the work to be scheduled in view of formal requests being issued unexpectedly. Concerning the second point, regular internal audits and the work of our Ethics Officer also shed light on our daily activities on this topic, which is a constant focus of attention.

In addition, many of the programme's sheets on methodological work make a direct contribution to improving the work's robustness: for example, following a formal request on polluted sites and soils, implementing an expert appraisal (Sheet 1.2.11) including both the response to the case in point (Saint Martin la Sauveté) and a methodological section aiming to facilitate the response to any similar requests in the future. On this methodological aspect, at the top of the table is the work of the ACCMER Working Group (Sheet 5.7.4), which is deploying the roadmap for support and implementation of the Scientific Board's recommendations, following completion of the work of the "Methodology of risk assessment" Working Group (MRA WG) and its transposition into the expert appraisal reference framework.

The contribution of the social sciences to expert appraisal activities, another factor behind the strengthening of our work's robustness, is expanding. This is reflected in more than 15 expert appraisals under way, mobilising these disciplines with the support of the Social Sciences, Expertise & Society Unit (MiSSES) (Sheet 8.2).

Moreover, various planned or cross-cutting tasks explicitly embody the desire for greater efficiency and robustness, in particular:

- The establishment of **the Vigilance Scheme Coordination Committee** (Sheet 9.2.1), a milestone in Theme 2.1 of the COP, brings together the five vigilance schemes led by ANSES (veterinary pharmacovigilance, nutrivigilance, PPV, toxicovigilance and the RNV3P), as well as the epidemiological surveillance schemes. It has enabled far-reaching actions to be initiated, complementary to the work on quality processes and on standardising these schemes: sources of information, methodological aspects (admissibility, accountability, data or opinion mining, etc.), procedures to be followed in response to a signal, exploitation and communication of results, monitoring of alerts and assessment of schemes.
- With regard to **work on reference data in food safety and nutrition**, the strategy for optimising the next Individual and National Study on Food Consumption (INCA) in France (Sheet 1.6.3) is based on joint work between *Santé Publique France* – leader of the ESTEBAN study – and ANSES, in order to

pool facilities and optimise resources. More specifically, other activities are under way to make more effective use of data, such as the development of automated data-matching tools (Sheet 1.7.6) to facilitate interoperability and extraction from databases coded according to different protocols (CIQUAL Sheet 1.7.2, CONTAMIN Sheet 1.7.3), or to move towards the digitisation of information collection for the OQALI database (Food Quality Observatory, Sheet 1.7.1) in conjunction with economic operators.

Lastly, the robustness or efficiency of other important Division activities will be further developed: **coordination of the National Research Programme for Environmental and Occupational Health** (Sheet 10.3) will have to deal with changes in the funding it can mobilise for its calls for research projects (budgeting of the IFER tax, funding of dedicated calls for endocrine disruptors – EDs), while national plans such as the SNPE2 or PNSE (transitioning from 3 to 4) increasingly stress the need to improve knowledge on risks. For the third consecutive year, a specific budget to support ED research has just been confirmed. In addition, 2020 should be an opportunity to strengthen the process that leads to the development of research questions based on the recommendations of expert appraisals. There is an ongoing debate about how to deal with the burden of a very large number of projects submitted, while ensuring the quality of follow-up of the selected projects (indicator 1.4 of the COP).

Lastly, particular vigilance will be needed with regard to plans to devolve individual decisions to ANSES, in order to preserve the independence of its expertise and ensure the coherence of its activities.

2. Initiating or completing major projects

Of all the different topics involving several entities within the Division, and extending beyond it to other ANSES entities, this summary has selected five major projects related to the implementation of national plans or schemes:

In environmental health, the end of summer 2019 saw the Ministers of Health and the Environment sign the **Second National Endocrine Disruptor Strategy (SNPE2)** at ANSES. The Agency is a historically committed contributor to characterising the hazards of ED substances and assessing the associated risks. This SNPE2 involves a number of different actors (both the Science for Expertise Division and the Regulated Products Division within ANSES) and mobilises both health risk assessment and research funding (Research Funding & Scientific Watch Department – DRV) functions, as well as the Agency's capacity for dialogue with stakeholders. Indeed, ANSES's work in compiling a list of substances of interest for their endocrine activity, regardless of their area of use, will serve as a basis for discussions within the framework of a meeting on EDs involving several Thematic Steering Committees (interCOT) (sheets 5.2.2 and 8.1). Sheet 5.2.2 also includes assessment work on three substances. Moreover, the Agency will set up internal coordination on this highly cross-functional topic, and will also monitor the work carried out in other agencies and in Europe, in order to maintain a dynamic list of substances for which the ED hazard status has been clarified. Another important development expected in early 2020 is the adoption of the fourth edition of the National Environmental Health Action Plan (PNSE4). One of its emblematic themes will be air quality, and more broadly the indoor environment, a subject on which the Division is continuing its efforts.

In food safety and nutrition, 2020 will see the start of work on one of ANSES's periodic reference studies carried out through the Division's "Methods and Observatories" field: **the third Total Diet Study (TDS3)**. Dialogue with the supervisory authorities on the substances to be measured was concluded in 2019 and led to the study's scientific scope and objectives being defined. However, visibility on the resources to be committed by the co-funders and ANSES needs to be clarified quickly, especially as this survey is one of the SNPE2 deliverables, since it will contribute to updating the contribution from food to exposure to EDs.

In occupational health, 2020 will be the **closing year of the third Occupational Health Plan**, for which the Division is the driving force as leader of various actions[26]. In particular, work that began in 2018 on the development of a thesaurus on reference occupational exposures (Sheet 9.1.2) should be completed in 2020. More broadly, the Agency's occupational health coordination will be mobilised to give some perspective to ANSES's achievements and contribute to the discussions of the DGT and social partners at a later stage.

In **plant health**, the FAO has declared 2020 to be the "International Year of Plant Health". This will be the first full year of entry into force of the new European Regulation (EU) 2016/2031 on protective measures against plant pests, and will result in a **revision of the categories and lists of regulated pests**. Two themes mentioned in the work programme concern pests considered "critical" due to their potential consequences: the *Xylella fastidiosa* bacterium and the *Bursaphelenchus xylophilus* pine wood nematode.

Tackling a national-scale issue through a more local approach, ANSES continues **its major efforts within the framework of the governmental roadmap for chlordecone in the French Caribbean**, including the prospect of supporting the aim to achieve the lowest possible dietary exposure to chlordecone, symbolised by the target of "zero chlordecone" in food. These efforts will take the form of work on health reference values for chlordecone (critical concentration value, possible updating of the TRV – Sheet 5.5.5), a formal request on the contribution of different crop management scenarios to reducing exposure from plantations (sheet to be created), a formal request prior to the creation of an occupational disease table for prostate cancer (Sheet 4.4.4) and the launch (subject to successful completion of the funding round) of a feasibility study for the first total diet study in the French Caribbean, to include all contaminants (Sheet 1.6.2).

To compensate for the lack of dialogue between representatives of the relevant stakeholders in these territories and the ANSES bodies (thematic steering committees, dialogue committees, etc.), the Agency has also proposed setting up an agreement with local authorities that would serve as a basis for organising these interactions, and in particular presenting the findings of the above-mentioned work.

Lastly, in 2020, ANSES also wants to **bring together various studies on the risks associated with nanomaterials**: finalisation of the health risk assessment on nanomaterials in food (Sheet 1.2.7), scientific and technical support to ministries once the European Commission has formulated its proposal for changing the definition of nanoscale substances, continuation of work under REACh on the classification of nanoform TiO2, summary work to highlight the various annual reviews on mandatory reporting of nanomaterials, priority actions to improve the scheme to be put in place (Sheet 3.2.1) and work carried out by the MiSSES on the issues, obstacles and legal levers relating to the use and sharing of data from the nanomaterial reporting scheme (Sheet 8.2). In addition, with regard to administrative matters, 2020 will also see the renewal of the agreement by which the DGPR entrusts ANSES with managing the R-Nano database.

Furthermore, the Division considers that the following major projects should be completed as part of the 2020 work programme:

- Support to the Ministry of Health in determining the impact of reformulation scenarios on nutrient intakes, with a view to improving the nutritional offer (Sheet 1.7.7). This will be supplemented by the launch of an expert appraisal to assess the health effect of reformulation scenarios (this will potentially be completed after 2020);
- Expert appraisal on antimicrobial resistance in the environment (Sheet 5.3.2, formal request 2016-SA-0252);
- Assessment of the potential health effects associated with exposure to augmented reality and virtual reality technologies (Sheet 3.1.1);
- Work to support the regulatory framework for the practice of intense pulsed-light (IPL) hair removal;
- Request 2018-SA-0150 on the TRV for sodium valproate and determination of reference values for the monitoring of occupational exposure to sodium valproate;
- Assessment of the hazard associated with asbestos ingestion (Sheet 1.2.12);
- Health and economic impacts associated with common ragweed in France (Sheet 3.3.4).

[26] Support companies in setting up effective and efficient prevention: Sub-action 2 on substitution; Action 1.11: Improve the way in which multiple exposure is taken into account and target certain occupational sectors that are particularly exposed to cumulative risks, Action 3.14: Continue standardising and reinforcing the strategic planning of research in occupational health, Action 3.10: Identifying, rationalising and harmonising the existing data with regard to monitoring, expert appraisal and vigilance in occupational health and safety in order to improve its exploitation and availability to prevention stakeholders.

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

Anticipating emerging threats and risks is one of the major themes of the COP (Theme 2) and, more broadly, constitutes the very essence of a health and safety agency.

The data collected by the various vigilance schemes led by ANSES, under the coordination of the Health Alerts & Vigilance Department (DAVS), already represent an important source of identification of emerging threats. In line with objective 2.1 of the COP, therefore, the Division will **support methodological advances relating to non-targeted data mining by automatically detecting signals** (syndromic surveillance, monitoring of chronological trends in poisoning by certain agents, data mining) – Sheet 9.2.5, and data mining in occupational health – Sheet 9.1.3. With regard to phytopharmacovigilance (Sheet 5.2.6), the year's work will be guided by the objectives defined in the **PPV 2019-2021 strategy**, with particular attention being paid to characterisation of the signals to be reported by the partners and definition of the monitoring indicator used to measure its effectiveness (this definition is a COP milestone whose implementation has been deferred).

In addition, the cross-cutting monitoring work managed respectively by the DRV – Sheet 10.1 – for scientific monitoring, and by the MiSSES – Sheet 8.1 – for societal monitoring, are other types of identification sources deployed.

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

With regard to risk assessment, the question of the *move towards a resource-efficient economy* (circular economy) could therefore lead to mechanisms for concentrating pollutants, which various expert appraisals will examine in the different fields: in environmental health (further work on tyre aggregates (Sheet 3.2.5), on the risks associated with the use of non-conventional sources of water (Sheet 3.4.4)), in occupational health (launch of the second phase, targeting a limited number of sectors for workers in waste recycling and recovery companies (Sheet 4.4.2)) or in animal nutrition (finalisation of the expert appraisal on the risks associated with the reuse of old foodstuffs (Sheet 2.1.3)).

With regard to *climate change and biodiversity*, it is worth mentioning two formal requests undertaken with the French Agency for Biodiversity on coral (Sheet 3.2.7), a worksheet in the field of vector control (Sheet 3.5.1), and two sheets on work to be undertaken in 2020 (management of the hazard posed by the Asian hornet to bee health (Sheet 2.4.3) and prioritisation of health hazards affecting drinking water production originating from climate change (Sheet 3.4.3, an internal request).

In the field of the *exposome*, ANSES will pursue the work undertaken with the Scientific Board in 2019 to determine the Agency's specific contribution through its different specialist activities – in particular that of expert appraisal in health risk assessment – to the issue of the exposome. In addition to this cross-cutting debate, which is being carried out by a WG of the Scientific Board, various studies will be conducted (e.g. on phthalates (Sheet 1.2.6) to take account of the different sources of exposure, on exposure to mixtures of substances (Sheet 5.7.1) or on "exposure trajectories" by cumulative exposure over time (Sheet 1.6.4)).

Meeting societal expectations also means **initiating expert appraisals in response to formal requests from stakeholders**, such as the assessment of the health consequences of air pollution in airliners on flight crews and passengers, which resulted from a formal request made by the various trade unions concerned (Sheet 5.2.3) and which was the subject of a favourable debate in ANSES's thematic steering committees in June 2019.

The Division also adapts to challenges through a third type of change, **by modifying the ways in which it supports public authorities or by developing its assessment methodologies**. In 2020, in food safety and nutrition, this will mainly concern the case of genetically modified plants: after having defined a non-systematic support method in 2019 (Sheet 1.3.2), ANSES will be able to begin groundwork on methods for assessing the risks associated with the use of GMOs in food and feed (Sheet 1.3.1) in order to adapt our methodological guides to biotechnological innovations, while ensuring that this work complements that of EFSA. With regard to water-related risks, the availability of the methodology for assessing the relevance of pesticide metabolites, resulting from the 2019 opinion, has led to changes in the support methods relating to drinking water safety (production of VMax // relevance assessment) (Sheet 1.2.1), alongside assistance with the transposition into

French law of the future European Directive on water, which will replace Directive 98/83/EC (Sheet 1.5.8), with the subject of ANSES's analysis being its expert appraisal methods for products and materials in contact with drinking water in conjunction with other European countries (Sheet 1.5.4). Publication of the second report on its work registering tobacco products and the related scientific analyses will provide an opportunity to clarify ANSES's assessment strategy for this type of activity (Sheet 5.4.1). Lastly, regarding production of health reference values, a dynamic planning mechanism for toxicity reference values (TRVs) similar to that defined in conjunction with the DGT for OELs in the workplace is expected to be set up.

Evidently, the research questions addressed by the Agency within the framework of the PNR-EST (Sheet 10.3) – and especially the projects funded within this framework – make a systemic contribution to emerging or evolving issues. The number of projects submitted remains very high (304 in 2019), which is a key point reflecting the mobilisation of scientific communities with regard to these emerging issues.

In addition, the MiSSES will also carry out a study on the Agency's positioning in terms of participatory research, to complement the work already completed on openness and dialogue with stakeholders (Sheet 8.1). At the same time, the DRV is the vehicle for including ANSES in the "Open Science" plan, through participation in the Committee for Open Science (CoSO) and distribution of this plan's elements through the Monitoring Unit, while liaising closely with all the scientific units.

4. Exploiting the results of expert appraisals

These topics are generally addressed at Agency level, but some of the actions are managed by the Division's entities or make major demands on their resources, in accordance with the general orientations for this field. For 2020, this mainly involves the following:

- In order to maintain the mobilisation of academic research teams on challenges regarding knowledge for safeguarding health and risk assessment, **two scientific conferences will be organised with funding agencies that complement ANSES** [DRV, to be completed/amended, Sheet 10.3]. As was the case in 2019, it was planned to make them coincide with the publication of a corresponding issue of the *Cahiers de la Recherche* on the same topics, enabling a greater number of projects funded by the PNR-EST to be presented;
- With a view to **increasing the visibility of the Agency's vigilance missions**, various means will be deployed to improve the dissemination of "Vigil'Anses" (Sheet 9.2.2): targeted translation into English, availability in HAL, etc. In addition, joint work will be conducted on the format of the vigilance mission reports under the guidance of the Department of Communication and Institutional Relations (DICORIS);
- In line with the COP's objective on the visibility of occupational health actions, the Division will define a strategy for active participation in various scientific congresses or symposiums, in particular **the 36th French Occupational Medicine Congress** to be held in Strasbourg in June 2020;
- Lastly, various teams from the Division, especially the MiSSES, will be actively involved in preparing an **international symposium organised by ANSES in early summer 2020 on the credibility of scientific expert appraisals and public decision-making, on the occasion of the Agency's 10th anniversary** (Sheet 8.2).

5. Supporting efforts in Europe and abroad

These actions are in line with Theme 3 of the COP orientations. Some of them are managed by the Division's entities or make major demands on their resources, in accordance with the general orientations.
For the Division, this means three main types of work: joint work combining the efforts of ANSES with its European counterparts in a specific field, research in which the teams may be leaders or contributors, and recurring work with the major European agencies in line with our national mission areas.

Regarding research work, it is important to mention:

- The Division's key role in driving a European Toxicology Programme (EU-TP) in connection with ongoing work in closely-related projects such as HERA (priorities for environmental health research) or HBM4EU;

- The launch and/or proposal of new H2020 projects on emerging topics or those where innovation is needed, such as the exposome (Athlete), the effects of endocrine disruptors on metabolism and obesity (GOLIATH), and risk governance on nanotechnologies (Riskgone);
- Following the success of the "food reformulation" component of the European Joint Action on Nutrition and Physical Activity (JANPA), a new European joint action, called Best ReMaP, is being set up to implement validated good practices. The Division is involved as a leader in monitoring the reformulation of processed products at European level.

Regarding work with the major European agencies:

- With EFSA: besides the continuation of existing cooperation, a debate has been launched on new ways of operating, EFSA has been welcomed into the RAKIP network, which is creating and developing a web platform to facilitate information exchange (data, models) between existing and future tools in the area of risk assessment (a joint initiative by ANSES and its partners BfR in Germany and DTU-Food in Denmark), and in the same year, the partnership with EFSA in plant health on the "Horizon scanning – Media and scientific literature monitoring" project will be extended until 2021;
- With ECHA: there is of course the deployment of recurrent REACh activities (Sheets 5.2.6 to 5.2.11) for which the agenda is determined in conjunction with the ministries, and participation in comitology bodies (Sheet 5.2.12). In addition, the closeness of the Division's units to ECHA's teams also enables them to participate in discussions on how to collectively develop the strategy on expert appraisal work in order to increase the Regulation's effectiveness (grouping of substances, etc.).

Lastly, on the subject of participation in joint work with counterpart entities:

- The end of the first Joint Action on Tobacco Control (JATC) and the contribution to the European Commission's 2021 report on implementation of the Tobacco Directive (2014/40/EU);
- In the area of vigilance, the contribution to the emergence of the OccWatch platform for exchanges between international experts on clinical cases of emerging occupational health problems (Sheet 9.1.4).

3. Regulated Products Division

The 2020 work programme of the Regulated Products Division will be structured around the following objectives:

- Improve efficiency, particularly to reduce the time needed to examine MA applications for plant protection products (PPPs);
- Implement major projects (provide scientific support to the competent authorities in the context of permanent missions and formal requests);
- Evolve to address the challenges:
  - Facilitate the submission of dossiers and particularly the submission of applications for biocontrol products, and facilitate their examination;
  - Develop ways to improve knowledge and analyse the health and environmental impacts of regulated products, both before and after they are placed on the market;
- Strengthen institutional relations and communication, particularly with stakeholders;
- Prepare for and adapt to European challenges in order to improve methodologies, assert its presence and reinforce its influence;
- Maintain and develop its international activity and presence to promote France's high standards.

1. Improve efficiency

Regarding the granting of marketing authorisations (MAs), ANSES will continue to be closely involved in the European assessment of plant protection and biocidal active substances, the zonal assessment of plant protection products, the assessment of biocidal products, fertilisers and growing media, as well as the assessment of veterinary medicinal products.

An action plan to improve timeliness in the examination of MA applications for plant protection products was drawn up and implemented in 2017. The effect of these initial measures, particularly on the processing of the oldest dossiers and the simplification of processes, became apparent by late 2018 and should continue in 2020.

This action plan, which was supplemented in 2019, will be further strengthened in 2020, in a context where the early effects of Brexit and the anticipated strong growth in applications concerning biocides will begin to be seen, and will lead to the increasing mobilisation of the Agency's resources.

The French Agency for Veterinary Medicinal Products (ANMV) will also continue to improve its processes in order to achieve greater efficiency, in a context where the implementation of Brexit is expected to significantly increase the number of applications and authorisations under its responsibility from 2020, and in order to prepare for the new European regulatory documents that will be implemented in 2022.

Information systems (IS) are essential to improving efficiency, and several strategic IS projects are coming on stream in 2020 such as D-PHY, a project to digitise the submission of applicants' dossiers, and VIGIE, a veterinary pharmacovigilance tool. At the same time, the Division is pursuing the development of IT tools (for analysing data on sales and use of veterinary medicinal products containing antibiotics).

The D-PHY project has been in a pilot phase since 2016 while its "claimed uses" component has been operational since 2018. It aims to become fully operational in late 2020 to digitise the submission of applications for plant protection products. The VIGIE project, on a new veterinary pharmacovigilance tool shared with the ANMV and the Veterinary Pharmacovigilance Centre in Lyon (CPVL), will be launched in 2020 to supplement the electronic submission website for pharmacovigilance. Work to fully digitise applications relating to MAs for veterinary medicinal products will continue in 2020, as will the ANMV's involvement in the interconnection with European databases and repositories.

In the field of biocides, a study to modernise the information system is currently under way, with the aim of defining specifications for the priority projects to be launched in 2020 (including monitoring the examination of biocide applications).

The extension of the MA Monitoring Committee's scope to biocides has been effective since 2019, when its members were also renewed for a second three-year term. This enables the Committee's work to continue with regard to adaptation, feasibility and compliance of the risk management measures contained in the MA, such as measures to protect residents and bystanders. Concerning veterinary medicinal products, the Monitoring Committee will be renewed for three years from the end of 2019, making it possible in 2020 to continue the work begun during the first term of office and to initiate new working themes.

2. Implementation of new key projects

ANSES will provide scientific support to the competent authorities, whether in the context of permanent missions or in response to formal requests.

In the area of surveillance and control, it regularly offers its expertise to State control bodies on plant protection products. It also carries out inspections of product formulation sites.

ANSES will provide its technical expertise in veterinary medicinal products to the Ministries of Health and Agriculture for preparation and adoption of the Order on adapting national provisions to EU law on veterinary medicinal products and medicated feed (Regulations No 2019/6 and No 2019/5).

In terms of formal requests, in 2020 ANSES will be working to respond to various requests as part of the government's plan to reduce pesticide use, and in particular the plan to phase out glyphosate. This will involve finalising the efficacy and risk assessment step of MA applications (renewals or new applications) for products containing glyphosate and then implementing the comparative assessment, on the basis of Article 50(2) of the European Regulation, for products still authorised at the end of the first phase. In addition, ANSES will monitor the progress of studies, funded under the Ecophyto plan, on the carcinogenic potential of glyphosate, for which the Agency has drawn up very precise specifications. In application of Article 76 of the French EGAlim Act, ANSES may be asked to propose the categories of biocidal products intended for non-professionals for which access to over-the-counter sales should be restricted.

It will continue to support various plans (EcoAntiobio2, Ecophyto, etc.), as well as public health policies on the prevention and control of arboviruses through its work on biocidal products used in vector control.

3. Changes to address the challenges

a. Facilitate the marketing of biocontrol plant protection products

While respecting the uniform assessment principles on which authorisations for plant protection products are based, as defined by Regulation (EU) No 546/2011, PPPs meeting the compositional criteria (nature of the active substance) for biocontrol products will continue to benefit from a priority procedure: tax reduced by between 50 and 95% depending on the nature of the products, applications submitted without delay, priority processing with the objective of minimising time to market.

On behalf of the Ministry of Agriculture, ANSES will continue to assess non-indigenous macro-organisms considered beneficial to plants, control methods that are also regarded as biocontrol solutions.

b. Develop ways to understand and analyse the health and environmental impacts of regulated products, both before and after they are placed on the market

ANSES will take part in numerous methodological projects and research programmes aimed at improving the assessment of regulated products. It takes pharmacovigilance signals and alerts into account.

For plant protection products and biocides, this work will cover aspects such as exposure scenarios and cumulative exposure, highly sensitising substances, setting MRLs in honey and hive products, pathogenicity of bacterial strains used in biocontrol, improved methods of assessing dietary exposure, and antimicrobial resistance. Following an alert issued by a group of researchers regarding SDHI fungicides, besides the many studies undertaken, ANSES issued an internal request to examine the question of cumulative exposure to the various SDHIs via food and will be issuing its opinion in 2020.

For plant protection products, the contribution of studies and surveillance data collected under the phytopharmacovigilance scheme will be decisive, both for assessing active substances and plant protection products and for adapting MAs according to these results and data.

In this field, ANSES's work[27] will focus particularly on improving knowledge in the following areas:

- exposure of the general population to PPPs, particularly via ambient air, and especially for residents in cultivated areas
- exposure of agricultural workers
- the impact of PPPs on biodiversity, bees and other pollinators
- the presence of PPPs in soil
- the specificity of the adverse effects of biocontrol products
- cumulative exposure to PPPs in the environment[2]

as well as on developing methodological tools for data mining.

ANSES will also participate in the European human biomonitoring project HBM4EU.

For all active substances, the work carried out under the toxicovigilance scheme with the support of the Working Group on "Toxicovigilance for regulated products" will also enable data on poisoning cases related to all regulated products to be analysed and taken into account when issuing, amending or withdrawing marketing authorisations.

Lastly, in the field of veterinary medicinal products, the ANMV will continue its efforts to communicate and promote the proper use of veterinary drugs and optimise the detection of pharmacovigilance signals. Promotion of veterinary pharmacovigilance remains a priority.

4. Strengthen institutional relations and communication, particularly with stakeholders

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

The platform for dialogue on plant protection products will make it possible to continue discussions and improve training and information for stakeholders on the context and the Agency's activities in this field. Access to PPP assessment documents will be facilitated with the online publication of assessment reports. Since late 2018, the merger of the registers of assessment conclusions and decisions on the website, and the publication of a monthly MA newsletter, have helped improve access to information on these activities. In 2020, ANSES will continue in this vein by regularly upgrading the E-Phy site to integrate user feedback and continuing to make data available as open data.
With regard to veterinary medicinal products, ANSES will strengthen its national, European and international communication strategy, particularly with regard to stakeholders.

Lastly, with the support of the Committee for Ethical Standards and Prevention of Conflicts of Interest (CDPCI) and following an opinion issued by this committee in 2019, ANSES will go further and extend implementation of the Charter on relations with interested parties, by adopting a methodology for analysing the equity of access of interested parties to ANSES, largely by drawing on a more usable register.

[27] See the DER's work programme

As the coming year has been declared the International Year of Plant Health by the United Nations, ANSES will be providing details and insights on its missions and work on the subject in general, and on its role concerning plant protection products in particular, at its stand and in its communication relating to the Paris International Agricultural Show.

5. Prepare for and adapt to European challenges in order to improve methodologies, assert its presence and reinforce its influence

ANSES will support the competent authorities in preparing for meetings of representatives of the Member States at European and international level: CPVADAAA[28] and CCPR[29] for plant protection products, BPC[30], CG[31] and meetings of the competent authorities and the SC[32] for biocidal products, participation in EPPO's[33] herbicide panel, and CVMP[34] and CMDv[35] for veterinary drugs. It will also provide support to the competent authorities in setting standards for fertilisers.

To better assert its point of view, ANSES will remain closely involved in European developments relating to methods for assessing the effectiveness and risks of regulated products.

In the area of plant inputs and biocides, it will continue to hold a leading position in Europe among the rapporteur Member States for the assessment of active substances or the setting of maximum residue limits (MRLs). For dossiers for which it is not the Member State, it will take an active part in the comment and peer-review phases. The Agency shares the opinions it publishes with the other Member States.

It will continue to participate actively in European methodological work, mainly on the cumulative effects of chemicals in general, and plant protection products in particular, and in the revision of European guidance documents for assessing the efficacy and risks of these products. It will be actively involved in drafting the guide for the assessment of biocides generated *in situ*, in collaboration with ECHA.

In the field of veterinary medicinal products, it will also maintain or develop a major presence in European bodies, mainly by strengthening its presence through positions as chairs and vice-chairs of European groups and by increasing its rapporteur work on European guidelines and dossiers. In the context of Brexit, the ANMV is continuing its preparation in order to position itself as a major agency for providing expert appraisals within the network of agencies at European level. For example, the ANMV has decided to run for a second term chairing the CMDv in 2020, and will continue its efforts in the network of HMA agency heads. With this in mind, the Agency also intends to organise a working meeting of the two main European veterinary medicine committees (CVMP and CMDv) in France in mid-2020 on the implementation of the new regulations, instead of and in agreement with the Croatian EU Presidency, which is not in a position to hold it.

In addition, the ANMV is continuing its major investment in the implementation of the new European regulations for veterinary medicinal products by providing support to its supervisory ministries with the negotiation of delegated and implementing acts for the new Regulation and the adaptation of French law. Lastly, it is providing significant expertise to the EMA and the European Commission for discussions on the implementation of the new information systems that are needed.

[28]CPVADAAA: Standing Committee on Plants, Animals, Food and Feed at the European Commission
[29] CCPR: Codex Committee on Pesticide Residues
[30] BPC: Biocidal Products Committee, under ECHA (European Chemicals Agency)
[31] CG: Coordination Group for Biocidal Products, for which ECHA provides the secretariat
[32] SC: Standing Committee on Biocidal Products
[33]EPPO: European and Mediterranean Plant Protection Organisation
[34] CVMP: Committee for Veterinary Medicinal Products, within the European Medicines Agency
[35] CMDv: Coordination Group for Mutual Recognition and Decentralised Procedures – Veterinary

6. Maintain and develop its international activity and presence to promote France's high standards

Through its mandate as an OIE Collaborating Centre in the field of veterinary medicinal products, the ANMV will continue its deep commitment to combating antimicrobial resistance, in particular by setting up the OIE database and training national focal points.

It will also continue providing assistance with development and sharing French expert appraisal through the various cooperation agreements signed with its partners worldwide (China, Thailand, Ukraine, Saudi Arabia), and will try to make exchanges with Russia a reality.