



FRENCH MINISTRY
OF AGRICULTURE
AND FOOD

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ECOANTIBIO 3

Reducing the risk of antibiotic
resistance and promoting
proper use of antimicrobials
in veterinary medicine

2023-2028 National plan



ecoantibio

Reducing the use of antibiotics in veterinary medicine



Editorial



During the World Antimicrobial Resistance (AMR) Awareness Week, the World Health Organization took the opportunity to remind us that this issue is one of the ten greatest global threats affecting humanity. Antimicrobial resistance is estimated to be responsible for 700,000 deaths globally each year. If nothing changes, infections caused by resistant infectious agents could become one of the leading causes of mortality worldwide by 2050, resulting in up to 10 million deaths ¹. In France, resistance to antibiotics alone (known as antibiotic resistance) still causes over 5,000 deaths each year².

Antibiotic resistance is a pressing public and global health challenge, at the crossroads of human, animal and environmental health. It circulates not only within human populations, between animals and in our ecosystems, but also between all three. Since 2016, the French ministries for Agriculture, Environment and Health have been coordinating their efforts against antibiotic resistance under a “One Health” approach, through an interministerial roadmap. During the French presidency of the Council of the European Union in 2022, the two ministers for agriculture and health also jointly organised a ministerial conference to raise awareness of this topic among our European partners.

This plan, Ecoantibio 3, is an opportunity to take stock of the two previous plans and celebrate the results achieved in the fight against antibiotic resistance in animal health. Between 2011 and 2022, exposure to antibiotics in France was cut by 52% and exposure to certain critical antibiotics such as 3rd- and 4th-generation cephalosporins was reduced by over 90%. Beyond the national scale, the European Union aims to reduce livestock exposure to antibiotics by 50% by 2030, compared to 2018, and to drop below the antibiotic exposure threshold of 59.2 mg/PCU in these animals. Beyond the national scale, the European Union aims to reduce exposure of livestock to antibiotics by 50% by 2030, compared to 2018, and to drop below the antibiotic exposure threshold of 59.2 mg/PCU in these animals.

France achieved this target in 2019 through successive Ecoantibio plans.

There are still numerous challenges to overcome and we should look to the future with the Ecoantibio 3 plan and tackle new issues to allow us to preserve the health of our fellow citizens and that of animals, and to keep our place as a model nation as regards proper use of antibiotics in animals. This plan is the result of a joint effort with the stakeholders. It is an opportunity to focus more on prevention and individualised medicine, to communicate and engage with farming and animal health professionals and people outside these sectors, and to broaden the plan’s scope beyond antibiotics alone to also include the proper use of antimicrobials and antiparasitics. To address these challenges, the French Ministry of Agriculture and Food will renew its commitment by publishing an annual call for proposals to fund research and action projects.

Thanks to the commitment shown by key players and the veterinarian-farmer relationship which ensured the success of the Ecoantibio 1 and 2 plans, I know that the Ministry of Agriculture and Food can count on their renewed support in achieving this third Ecoantibio plan, within a 5-year timescale. Once again, it’s time to showcase our cutting-edge and resilient agriculture and veterinary medicine.

Marc Fesneau,
French Minister for Agriculture and Food

1. Source: Review on Antimicrobial Resistance, O’Neill J. Tackling drug-resistant infections globally: final report and recommendations. London: AMR; 2016. https://amrreview.org/sites/default/files/160518_Final%20paper_with%20cover.pdf

2. Source: Public Health France. <https://www.santepubliquefrance.fr/maladies-et-traumatismes/infections-associees-aux-soins-et-resistance-aux-antibiotiques/resistance-aux-antibiotiques/la-problematique/#tabs>

3. Population Correction Unit

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From Ecoantibio 2 to Ecoantibio 3

Many targets have been met in the field of antibiotic resistance in animal health since 2011.

In that year, the French ministry for agriculture, together with the veterinary and farming professions, committed to reducing the use of antibiotics in animals, primarily via the Ecoantibio 1 plan (2011-2017). The initial objective was to reduce the use of antibiotics in veterinary medicine by 25% between 2012 and 2016. This was largely exceeded since antibiotic exposure in fact dropped by 37% over those 5 years, all sectors combined. The law on the future of agriculture, food and forestry (LAAAF) adopted on 13 October 2014 also introduced a specific target to reduce animal exposure to critically important antibiotics by 25% between 2013 and 2016, which was also achieved during the Ecoantibio 1 plan. Between 2013 and 2016, exposure to 3rd and 4th-generation cephalosporins dropped by 81% and exposure to fluoroquinolones by 75%.

Ecoantibio 1 paved the way to Ecoantibio 2 in 2017, which presented new ambitious objectives, specific to certain antibiotics and for certain sectors: reduce exposure to colistin in the beef, pork and poultry industries by 50% over 5 years, and reduce the prevalence of ESBL-producing E-Coli bacteria in poultry samples (broiler chickens) at the distribution phase by 50% over 5 years.

This second plan also sought to achieve a downtrend across all markers of antibiotic resistance, all sectors combined.

To meet these targets, the Ecoantibio 2 plan comprised 20 actions built around 4 strategic priorities:

- Developing preventive measures against infectious diseases and facilitating the use of alternative treatments;
- Communicating and educating on the goals and issues of AMR control, rational antibiotic prescription and other ways of controlling infectious diseases;
- Shared tools - providing tools for the evaluation and monitoring of antibiotic use and tools for prescribing and administering antibiotics responsibly;
- Sharing the effort - Ensuring satisfactory application of the rules for correct use at national level and encouraging their adoption across the EU and internationally.

The objectives of the Ecoantibio 2 plan were largely achieved thanks to the significant efforts of the relevant stakeholders, particularly veterinarians and farmers. Animal exposure to colistin dropped by 72% in 2022, compared to the 2014-2015 average.

The Ecoantibio 1 and 2 plans resulted in an overall reduction in animal exposure to antibiotics of 52% between 2011 and 2022. This success meant that France was able to contribute to achieving the objectives of the European “Farm to Fork” strategy, which seeks to reduce farm animal exposure to antibiotics by 50% by 2030 on a Europe-wide basis, i.e. to reach an exposure level of 59.2 mg/PCU throughout Europe by 2030.

The Ecoantibio 2 annual call for proposals: the French Ministry of Agriculture and Food’s (MASA’s) continued commitment to the fight against antibiotic resistance

Beyond the national and European regulatory instruments put in place to regulate the use of antibiotics in animal health (such as French decree no. 2016-317 of 16 March 2016 pertaining to the prescription and issuance of veterinary medicines containing one or more critical antibiotics, the order of 18 March 2016 setting out the list of critical antibiotics and Regulation (EU) 2019/6 on veterinary medicinal products), the fight against antibiotic resistance in France has been driven by incentive-based measures funded by a call for proposals launched annually by the Ministry of Agriculture since 2017.



Thanks to the support of the key players in the Ecoantibio 2 plan, the annual calls for proposals made between 2017 and 2023 were very successful and made it possible to cover a wide range of actions from the plan.

Between 2017 and 2023, the Ministry put forward more than 9 million euros to fund research and action projects in France, thus covering all 15 actions of the plan that were eligible for calls for proposals. All sectors have been represented, with 7 projects funded in the aquaculture industry, 10 in poultry farming, 23 in the beef industry, 19 in the goat and sheep industry, 6 in rabbit farming, 8 in the equine sector, 18 in the pork industry and 25 projects all sectors combined. Be they research projects to determine the molecular mechanisms of antibiotic resistance, for example, or training and communication actions for professional use, these projects have proved to be powerful tools in mobilising the relevant stakeholders and encouraging proper usage of antibiotics in practice.

In 2023, over 20 projects were still underway. They are expected to yield results by 2025. At the start of 2024, 16 new projects (all sectors combined) will be launched. These projects were the winners of the latest call for proposals launched in early 2023 ahead of the launch of Ecoantibio 3.

Indeed, there are numerous actions to be undertaken and deployed in light of the results of Ecoantibio 2 and of recent trends in terms of antibiotic resistance in animal health.

In 2021, the French Ministry of Agriculture and Food appointed the French High Council for Food, Agriculture and Rural Areas (CGAAER) to review the Ecoantibio 1 and 2 plans and discuss the options for changes to be made in anticipation of a 3rd edition. This mission was coordinated with an inter-inspections mission focusing on the evaluation of the interministerial roadmap to combat antibiotic resistance. The CGAAER⁴ report, published in May 2022, gave a largely positive review of Ecoantibio plans 1 and 2. It did however stress that there are still numerous actions to be undertaken and deployed for Ecoantibio 3, particularly with regard to preventing and combatting the spread of resistance between the different compartments.



Although the results of Ecoantibio 2 met the objectives for animal exposure to antibiotics, reductions in exposure remain unequal depending on the species and are less marked in pets. We have seen an increased prevalence of certain types of bacterial resistance in animals, in particular, since 2018, that of the E. coli bacteria to amoxicillin with or without clavulanic acid. **This should prompt us to encourage the relevant stakeholders to remain vigilant and to continue to strive towards proper usage of antibiotics.** Maintaining low levels of animal exposure to antibiotics for all species should be prioritised.

The scientific opinion⁵ of France's agency for food, environmental and occupational health and safety (ANSES), published in June 2023 in response to a 2020 submission made by the country's Directorate General for Food (DGAL), lists bacteria/antibiotic family pairings of priority interest in controlling the spread of antibiotic resistance from animals to humans and proposes technical measures to support the people managing this. It also calls for greater measures to prepare for and combat the spread of antibiotic resistance.

4. <https://agriculture.gouv.fr/evaluation-des-deux-premiers-plans-ecoantibio-et-preparation-du-troisieme>

5. Saisine n°2020-SA-0066, <https://www.anses.fr/fr/system/files/SABA2020SA0066Ra.pdf>

A new interministerial roadmap to combat antimicrobials has been published, which paves the way for new projects targeting antimicrobial and antiparasitic resistance for Ecoantibio 3

In full coherence with a "One Health" approach, the timing of the publication of Ecoantibio 3 coincides with the work currently being carried out to build the new interministerial roadmap to combat antimicrobial resistance.

The interministerial roadmap aims to address "One Health" issues, at the interface of at least two of the three health domains (human, animal or ecosystem) and comprises 5 strategic priorities and objectives.

These are: involve all stakeholders; research and innovation; arsenal of healthcare products; surveillance and indicators; a French team that is a driving force in Europe and internationally. In conjunction with inter-sector policy, MASA will implement actions to promote these broad strategic objectives in the animal health domain via the Ecoantibio 3 plan.

In relation to this new roadmap, the Ecoantibio 3 plan includes combatting resistance to antimicrobials other than antibiotics, in particular antiprotozoal and antifungal agents.

Antiparasitic resistance is of growing importance in the veterinary public health domain today. However, some of the mechanisms governing resistance to medicinal products, or more broadly, the players involved in this resistance, are similar for antimicrobial and antiparasitic agents. As such, and in accordance with the CGAER's recommendations which encourage us to tackle this subject, the Ecoantibio 3 plan addresses the fight against



antiparasitic resistance in the first specific measures. **The Ecoantibio 3 plan will be predominantly focused on combatting antibiotic resistance, but some actions, notably actions to raise awareness of the proper use of medicinal products and to combat the spread of resistance, will be opened up to include antimicrobials and antiparasitics for the first time.**

The good results obtained from Ecoantibio 1 and 2 are motivating factors in drawing up the third plan. Building on its support for reducing the use of antibiotics and the commitment of the relevant stakeholders mobilised during Ecoantibio plans 1 and 2, Ecoantibio 3 must consolidate these successes and gradually tackle new challenges relating to antimicrobial and antiparasitic resistance, over the next 5 years.



Antibiotics, antimicrobials and antiparasitics

The Ecoantibio 3 plan is primarily focused on antibiotic resistance, but it also includes antimicrobial and antiparasitics for the first time.

Regulation (EU) 2019/6 distinguishes between antimicrobials, including antibiotics, and antiparasitics as follows:

- **“antimicrobial”** is defined as any substance that acts directly on microorganisms and is used to treat or prevent infections or infectious diseases, including antibiotics, antivirals, antifungals and antiprotozoal agents.
- **“antiparasitic”** is defined as any substance that kills parasites or prevents their growth, and is used to treat or prevent an infection, infestation or disease caused or transmitted by parasites, including substances with repellent properties.



Key founders of the Ecoantibio 3 plan

The Ecoantibio 3 plan lays the groundwork for the following major principles, which will be the foundation for implementing the main objectives, strategic priorities and actions over the next 5 years.

| A “One Health” challenge

The majority of antibiotics used in animals are also used in humans, and bacterial resistance to antibiotics is sometimes transmissible from animals to humans and vice versa, directly or via the environment. As such, combatting antibiotic resistance is the very definition of a “One Health” challenge. This is demonstrated by the inclusion of the Ecoantibio 3 sectoral plan in the interministerial roadmap. Furthermore, resistance to antimicrobials and antiparasitics threatens the health of livestock and, therefore, food safety and security for human populations.

The persistence of antimicrobial and antiparasitic resistance in the environment and the impact of climate change on the prevalence of certain diseases, resulting in increased use of antimicrobials and antiparasitics, means that we must take the health of ecosystems into account when considering the matter of resistance.

| A challenge in terms of sustainability, including economic sustainability, for agricultural systems

Ecoantibio 3 aims to promote proper use of antibiotics, other antimicrobials and antiparasitics, in order to maintain their efficacy for future generations and thus ensure the sustainability of agricultural systems. The economic security of farms is threatened by resistance to these medicinal products and the risks of therapeutic dead ends. The efficacy of antimicrobials and antiparasitics is, thus, a common good for farmers and veterinarians that we must seek to preserve.

The veterinarian-animal owner relationship is fundamental in the proper usage of medicinal products

Proper use of veterinary medicines must be based on a solid, trusting veterinarian-animal (either livestock or pet) owner relationship, to obtain a judicious and optimised use of antimicrobials and antiparasitics. In combatting antimicrobial and antiparasitic resistance, veterinarians can consolidate their work to improve public health and ecosystem sustainability.



The major objectives of the Ecoantibio 3 plan over the next 5 years

The Ecoantibio 3 plan aims to limit the emergence and spread of antimicrobial and antiparasitic resistance in animals and their associated risks. This can be broken down into 5 sub-objectives.

Maintain the pace of the reduction in current exposure levels to antibiotics.

The Ecoantibio 3 plan aims to maintain the pace of the two previous plans in reducing antibiotic exposure levels, ensuring that the current antibiotic exposure level remains below the ALEA⁶ national exposure indicator of 0.3, corresponding to a reduction in exposure of approximately 50% since 2011.

However, the reductions in exposure for each species are still unequal and are less pronounced in pets, where antibiotic exposure levels in 2022 are close to those estimated in 2011 (-3%), as shown in **Appendix 1**. Indeed, after a phase of reduced exposure during the first Ecoantibio plan, exposure started to rise over the period of the second plan, returning to its initial level.

Although pets only represent a small proportion in the total tonnage of antibiotics sold, and this sector has made significant strides in reducing the use of critical antibiotics, their proximity to humans requires us to actively pursue efforts to reduce the use of antibiotics in pets, in a “One Health” approach.

Thus, the Ecoantibio 3 plan seeks both to maintain the pace of reduction, keeping below current exposure levels for all livestock categories, as well as specifically targeting antibiotic exposure reduction for pets.

During the Ecoantibio 1 period between 2011 and 2016, the pet sector managed to reduce exposure to antibiotics by close to 20% (Appendix 1). This trend was subsequently reversed between 2016 and 2022. **As such, the objective for the Ecoantibio 3 plan is to regain this pace and reduce the exposure of dogs and cats to antibiotics by 15% over the course of the next 5 years. To mitigate the annual variability in this exposure, reference will be made to the average of the 2020-2022 three-year period and the objective should be achieved in the 2026-2028 three-year window.**

For horses, one of the objectives of the Ecoantibio 3 plan will be to better evaluate exposure by considering the specific characteristics of the sector and to continue to promote judicious antibiotic use.

Maintaining the therapeutic arsenal in animals

The Ecoantibio 3 plan will seek to maintain a therapeutic arsenal of effective antibiotic therapies available to veterinarians. The problems related to delays to availability of amoxicillin, with or without clavulanic acid, must be contained by promoting a judicious, optimised and diversified use of antibiotics and by an effort to maintain a sufficient range of antimicrobials available.

6. The ALEA (Animal Level of Exposure to Antimicrobials) indicator represents the ratio between the estimated treated live weight and the biomass of the animal population in France.

Strengthening prevention against diseases requiring the use of antimicrobials and antiparasitics

Reducing the prevalence of infectious diseases in animals is the first pillar in the fight against antimicrobial and antiparasitic resistance. The Ecoantibio 3 plan seeks to promote vaccination of livestock and pets against animal diseases requiring the use of antimicrobial and antiparasitic agents. It will also emphasise non-medicinal prevention via biosecurity and promote zootechnic practices (livestock handling and genetics, etc.) that prevent infections.

Promoting proper use of antimicrobials and antiparasitic agents at an animal and flock/herd level

The Ecoantibio 3 plan places the emphasis on individualised medicine, and judicious and optimised use of antibiotics in animals. On a collective level, it is also important to issue reminders about the proper application of regulations concerning prophylaxis and metaphylaxis. The deployment of the Calypso tool will allow professionals to make use of self-assessment data of their practices. The Ecoantibio 3 plan must capitalise on acquired experience in terms of proper use of antibiotics, and on the engagement of professionals, to also promote the judicious use of other antimicrobials and antiparasitics.

Better understanding resistance to antimicrobials and antiparasitics

The Ecoantibio 3 plan seeks to support research that provides a better understanding of the precise mechanisms governing the emergence and transmission of antibiotic resistance, notably via the **development of whole-genome sequencing**. In accordance with the interministerial roadmap, the development of inter-sector indicators of antibiotic resistance over the next 5 years is a priority of this plan. Ecoantibio 3 must also aim to better understand the phenomena of resistance to other antimicrobials and antiparasitic agents for the most common pathologies.

Driving engagement with antibiotic resistance among the relevant sectors, professionals and in citizens

The engagement of professionals must be maintained via regular communication campaigns, promoting correct behaviour and highlighting the successes of the plan. It is essential to disseminate messages conveying a better understanding of the rules for proper use of antibiotics in livestock and pets, and of the associated risks, to the general public and consumers. Adapting the Ecoantibio 3 plan to fit local circumstances will help to mobilise field actors on a more regional scale.



Governance of the Ecoantibio 3 plan

The Ecoantibio 3 plan is led by DGAL, accompanied by a **steering committee (Copil)** made up of the plan's key players, each responsible or jointly responsible for one or more of the plan's actions. The key players are tasked with bringing to fruition a specific set of tasks by proposing a **plan of action** to DGAL, which sets out, in particular, the specific objectives for each action. The key players report these results to the steering committee. They are also involved in consolidating the Ecoantibio annual call for proposals, communicating it, and selecting the winning projects.

The key players of the Ecoantibio 3 plan are:

- French agricultural technical institute coordination association (ACTA)
- French association of public veterinary analysis laboratory directors and supervisors (ADILVA)
- French association of companion animal veterinarians (AFVAC)
- French agency for veterinary medicinal products (ANMV)
- French agency for food, environmental and occupational health and safety (ANSES)
- French veterinary training body (APFORM)
- French equine veterinary association (AVEF)
- French national board of veterinarians (CNOV)
- French veterinary schools
- French federation of veterinary unions (FSVF)
- French health protection group (GDS France)
- France's National Research Institute for Agriculture, Food and Environment, (INRAE)
- French animal health network (RFSA)
- French veterinary medicine and diagnostics industry union (SIMV)
- French national society for veterinary advisory organisations (SNGTV)

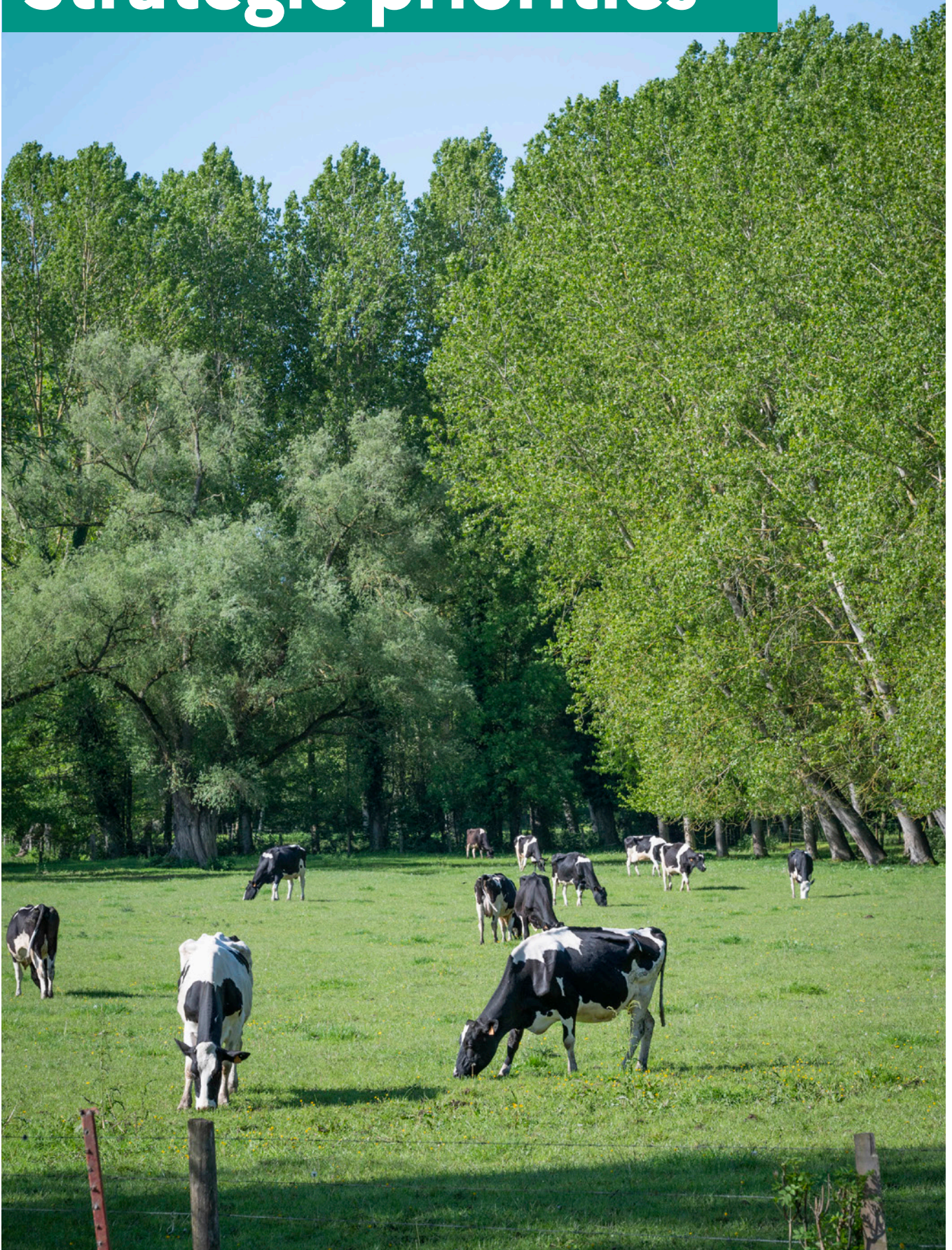
Furthermore, each year, the key players report their action(s) to an **Ecoantibio 3 plan monitoring committee**, headed up by DGAL, and made up of the steering committee as well as representatives from the French department for health and prevention, the Department for ecological transition and regional cohesion, interbranch organisations, agricultural unions, pharmaceutical companies, the French national board of pharmacists, research institutes and consumer and animal protection associations.

This annual meeting will help to make the Ecoantibio 3 plan more widely known and to get feedback from a wide range of stakeholders on its work and priorities.

The governance of the Ecoantibio 3 plan is also integrated into the interministerial governance of the national coordination of the fight against antimicrobial resistance.



Strategic priorities



Strategic priority 1

Preventing the emergence and spread of resistance to antimicrobials and antiparasitics in livestock and pets

Strategic priority 2

Training, awareness-raising and engagement in the field of antimicrobial and antiparasitic resistance, with a “One Health” approach.

Strategic priority 3

Research and surveillance of antimicrobial and antiparasitic resistance in animal health

Strategic priority 4

Maintaining, improving and developing a therapeutic arsenal that promotes the proper use of antimicrobials and optimises prescribing practice in animal health

Strategic priority 5

Combatting antimicrobial and antiparasitic resistance in animal health, on a regional and international scale

Strategic priority 1

Preventing the emergence and spread of antimicrobial and antiparasitic resistance in farm animals and pets

The purpose of this strategic priority is to prevent the emergence and spread of antimicrobial and antiparasitic resistance, via four components: reducing the prevalence of diseases by developing tools and disseminating good practices backed up by convincing economic data (Action 1 and Action 2); proper use of antimicrobial and antiparasitic agents (Action 3, Action 4 and Action 5); developing tools and management indicators relating to antibiotic resistance in livestock (Action 6), and preparing for situations of emergence (Action 7).

Some actions in strategic priority 1 specifically target antimicrobial resistance (Actions 4 to 7).

ACTION 1

Develop and disseminate preventive drug- and non-drug-based guidelines and tools to reduce the prevalence of diseases requiring the use of antimicrobials and antiparasitics

Key players: SNGTV, AFVAC, AVEF, ACTA, GDS France

Livestock: SNGTV, ACTA, GDS France

Equine: AVEF, ACTA

Pets: AFVAC

Timeframe: Action throughout the plan

Studies to develop or elaborate on guidelines and tools to reduce the prevalence of diseases requiring the use of antimicrobials and antiparasitics will be conducted as needed. This action also includes the dissemination and promotion of these guidelines, particularly in the form of communication actions.

Vaccination against diseases requiring the use of antimicrobials and antiparasitics will be promoted via campaigns intended to encourage take-up thereof, targeting livestock and pet owners. Indicators will be introduced to monitor the numbers of animals vaccinated against the most common animal diseases requiring the use of antibiotics. In line with other actions of the plan, a list of existing gaps in vaccine coverage will be regularly updated so that the needs can be visualised and to encourage the development of new animal health vaccines.

Biosecurity is a fundamental pillar in the fight against the emergence and spread of antimicrobial and antiparasitic resistance. Commendable biosecurity practices will be promoted, while those at risk of creating further resistance in livestock and pets will be listed and distributed to farmers. A study will be carried out into the role of buildings and the maintenance of farm surroundings, in order to prevent the introduction and spread of bacterial or parasitic animal diseases, in particular via vectors, in connection with climate change adaptation efforts.

Finally, studies on the role of animal feed and the microbiota in the prevention of bacterial and parasitic diseases, and on the selection of animals that are naturally resistant to diseases requiring the use of antimicrobials and antiparasitics, will also be carried out and their results published.

ACTION 2

Convince livestock and pet owners of the benefit of preventing animal-borne diseases requiring the use of antimicrobials and antiparasitics

Key players: ANSES, FSVF, ACTA

Timeframe: First results expected in 3 years

Economic studies will be carried out that aim to demonstrate the benefits of vaccination, biosecurity, or other preventive methods. They aim to obtain data that can convince farmers, pet owners and veterinarians of these benefits. Studies seeking to understand the obstacles and levers to implementing preventive measures and the proper use of medicinal products will also be carried out.

These results may be made available to insurance companies that reimburse animal health costs, particularly for pets, so that they can communicate these messages more widely among owners, or even adapt their offering to encourage preventive measures.

ACTION 3

Promoting proper usage of antimicrobials and antiparasitics to all who use them

Key players: CNOV, SNGTV (French network of veterinarians specialising in antibiotic therapy), ANMV

Timeframe: Action throughout the plan

The Ecoantibio 3 plan aims to reinforce correct regulatory use of antimicrobials and antiparasitics, reminding practitioners and owners of the regulatory framework in which these medicinal products are to be used. Emphasis will be placed on compliance with regulations and correct application of European regulations (EU) no. 2019/4 and (EU) no. 2019/6 pertaining to the use of antimicrobials as prophylaxis and metaphylaxis. Farmers will be reminded of requirements pertaining to recording treatments in livestock registries, and messages targeting livestock advisers will also be sent out.

The plan will also emphasise the importance of the veterinarian-owner relationship to ensure correct use of medicinal products, in an attempt to combat self-medication among animal owners.

Studies will be conducted to rationalise, optimise and personalise antibiotic treatments in animals, to improve knowledge concerning good use of medicinal products among practitioners.

To support all these actions, the specialist antibiotic therapy network for veterinarians will be revitalised and strengthened in its tasks of promoting proper medicinal use, publishing scientific recommendations and reiterating the regulatory framework in which antimicrobials should be used.

ACTION 4

Develop and promote the use of effective laboratory tests to support therapeutic decision-making in veterinary medicine to optimise the use of antimicrobials

Key players: SIMV, ADILVA

Timeframe: Action throughout the plan

Practitioners will be made aware of the importance of conducting diagnostic tests and of making information about these tests, such as their sensitivity and specificity, available. Practitioners will be encouraged to use high-performance diagnostic tests to reduce and optimise their use of antimicrobials. These tests will also be promoted to ensure that the legislation is correctly applied, and in particular article 107.3 of regulation (EU) 2019/6. The use of antibiotic sensitivity tests will also be promoted, beyond their inclusion in the regulatory framework for certain critical antibiotics, and information will be provided on their correct use and interpretation.

ACTION 5

Organise consensus conferences on the use of antibiotics within the context of microbial diseases of particular interest in the animal health field

Key player: ANMV

Timeframe: Within 5 years

Recommendations on the use of antimicrobials in infectious diseases for the different sectors will be published, based on consensus conferences bringing together representatives from ANMV, practitioners from technical veterinary organisations and members of French veterinary schools. These recommendations, with one entry per condition, may concern antibiotic therapy practices requiring consensus and/or health-related situations not covered by veterinary medications and will be based on clinical and epidemiological knowledge. These recommendations will be disseminated nationally via the network of specialist antibiotic therapy centres, and possibly also internationally.

DGAL will also launch an annual competition for clinical cases involving antibiotic resistance. This will serve to showcase clinical situations involving judicious and optimised antibiotic use.

ACTION 6

Develop health-based tools and management indicators related to exposure to antibiotics and antibiotic resistance in farming

Key players: ADILVA, INRAE

Timeframe: Within 5 years

Health-based tools and management indicators related to exposure to antibiotics and antibiotic resistance in farming will be developed and rolled out. These indicators will build on the indicators already developed by ANSES and ANMV. These include management or decision support tools, as well as self-assessment and farmer-veterinarian dialogue tools. The tools can cover all animal species bred for commercial purposes, and could be used to support the work undertaken for other actions, relating to disease prevention and proper antibiotic use.

ACTION 7

Develop “One Health” strategies in preparation for the emergence of multi-resistant epidemic zoonotic bacteria

Key player: ANSES

Timeframe: Within 5 years

To be able to plan the management of any emerging cases of multi-resistant epidemic zoonotic bacteria, preparation strategies will be jointly developed with professionals from the sector based on the recommendations published by ANSES. These strategies will comprise proposals of action(s) to be taken in terms of surveillance and control, depending on the different epidemiological hypotheses and the diagnostic capacities of laboratories.

Strategic priority 2

Training, awareness-raising and engagement in the field of antimicrobial and antiparasitic resistance in animal health, with a “One Health” approach.

Strategic priority 2 guarantees the conditions necessary for the engagement and mobilisation of stakeholders in the field of antimicrobial and antiparasitic resistance, thanks to training provided to veterinary professionals (Action 8, Action 9) and farmers (Action 10) and decision-makers in a “One Health” approach (Action 11). Pet and horse owners will be made aware of the risks relating to antimicrobial and antiparasitic resistance (Action 12). Finally, a study will be conducted on “antibiotic-free” labelling to improve consumer information (Action 13).

Some actions in strategic priority 2 specifically target antimicrobial resistance (Actions 8, 11 and 13).

ACTION 8

Develop tools for veterinarians to self-assess their antimicrobial use in the database in the Calypso information system

Key players: CNOV, ANMV

Timeframe: Within 5 years

The Calypso information system was created in 2021. It collects data on the prescription and dispensing of antimicrobials among veterinarians and pharmacists, as well as manufacturers and distributors of medicated feed. These data are sent to ANMV for processing and transfer to the European authorities. The purpose of these data is to fine-tune the assessment of animal exposure to antimicrobial substances, and therefore, contribute to monitoring resistance to these substances.

Within 5 years, and based on the studies already conducted on this database, Calypso will provide practitioners with a tool for self-assessing their antibiotic prescribing practices so that they can see where they stand in terms of national averages.

ACTION 9

Train veterinarians and veterinary nurses in the risks of antimicrobial and antiparasitic resistance

Key players: French veterinary schools, APFORM, AFVAC, AVEF, SNGTV

Timeframe: Action throughout the plan

During their initial training, all veterinarians will receive instruction on the judicious use of antibiotics as part of a “One Health” framework, in order to limit antibiotic resistance and the zoonotic and professional risks this incurs, with emphasis on preventing the transmission of nosocomial infections. Once qualified, every veterinarian will have learnt that they need to judiciously prescribe antimicrobials and antiparasitics to ensure

the sustainability of their therapeutic arsenal. Since the scientific knowledge and related legislation is rapidly evolving, their initial training must be complemented by continuing professional development focused on the risks of antimicrobial and antiparasitic resistance, to be continued throughout their working life. Initial and continuous training of veterinarians on antimicrobial and antiparasitic resistance will be promoted.

Veterinary nurses must also receive initial and continuous training concerning the judicious use of antibiotics and the consequences of certain treatment practices on antibiotic resistance, as well as the correct use of antiparasitics. These good practices will be communicated via training bodies and veterinary training practices. To this end, antibiotic resistance training guides targeting training bodies and veterinary training practices will be developed and published.

ACTION 10

Train livestock farmers in the risks of antimicrobial and antiparasitic resistance

Key players: GDS France, ACTA

Timeframe: Action throughout the plan

It is essential to ensure that up-to-date knowledge on antimicrobials and antiparasitics is accurately transmitted to current and future generations. As such, the Ecoantibio 3 plan, supported by the French directorate general for teaching and research (DGER), aims to ensure that all professional breeders, of both livestock and pets, are made aware of the risks linked to such resistance and of the practices they should employ to limit the emergence and spread, as part of their initial training. Continuing professional development in this field will also be promoted. At each training centre, the training will be based on concrete cases and projects carried out with agricultural and regional teaching farms. This training could be based on recent knowledge acquired from research and development programmes.

Self-assessment tools aimed at farmers will be developed based on new studies as well as on work already carried out as part of the Ecoantibio 2 plan, related to other actions of the plan.

ACTION 11

Train decision-makers in the risks of antibiotic resistance in animal health with a “One Health” approach

Key players: DGAL

Timeframe: Within 5 years

A specific component of the fight against antibiotic resistance according to the “One Health” approach will be included in the One Health Institute’s curriculum: public and private decision-makers will thus be trained in the challenges of antibiotic resistance in animal health as part of the “One Health” approach, with emphasis on the health, environmental and socio-economic impacts of this problem, the greatest associated zoonotic threats and the importance of a no-holds-barred approach to surveillance in crisis preparation plans. This action will be carried out in close coordination with the guidance and actions found in the interministerial roadmap.

ACTION 12

Raise awareness among pet and horse owners of the risks of antimicrobial and antiparasitic resistance, and provide information on the risks of self-medicating

Key players: AFVAC, AVEF

Timeframe: Action throughout the plan

Pet and horse owners will be made aware of the risks of antimicrobial and antiparasitic resistance, via specific communication campaigns, particularly in veterinary care facilities and equestrian centres. These campaigns will highlight the risks of self-medication and the importance of seeking veterinary advice to reduce the risks associated with antimicrobial and antiparasitic resistance. Self-assessment tools targeting horse and pet owners will be rolled out.

ACTION 13

Undertake a reflection on “antibiotic-free” labelling to ensure accurate consumer information

Key player: DGAL

Timeframe: Within 5 years

Some private organisations have voluntarily introduced labels on their products concerning the use of antibiotics in livestock farming. However, the wording of these labels is still highly variable and is likely to mislead consumers as to the actual added value of foodstuffs produced using these production methods. DGCCRF will conduct a study to identify a set of characteristics for “antibiotic-free” labels, in order to ensure accurate information is relayed to consumers.

Strategic priority 3

Research and surveillance of antimicrobial and antiparasitic resistance in animal health

Strategic priority 3 aims to improve the surveillance of antibiotic exposure and resistance (Actions 14 and 15), better understand the phenomena of cross-resistance (Action 16) and roll out this surveillance in the form of a regional and “One Health” approach (Action 17). It also seeks to expand this surveillance to include other antimicrobials and antiparasitics, so that the biggest issues of resistance in animal health in this field can be understood more concretely (Action 18).

Therefore, strategic priority 3 mostly focusses on antibiotic resistance surveillance, but it also paves the way to including resistance to other antimicrobials and antiparasitics.

ACTION 14

Optimise current indicators of exposure to antibiotics and develop indicators for other antimicrobials. Establish the link between resistance and exposure to antibiotics

Key players: ANMV, ANSES

Timeframe: Within 5 years

The Ecoantibio 3 plan aims to consolidate the existing indicators of antibiotic exposure. It also aims to improve and optimise these indicators for each animal sector and sub-category, in particular by implementing indicators that are better adapted to the specific features of certain sectors, such as, for example, the equine sector. The collection of usage data via Calypso should eventually provide a more accurate assessment of exposure by sector. Furthermore, analyses and studies will be conducted to build our knowledge of the links between exposure to antibiotics and antibiotic resistance, based on the data obtained from animal health surveillance systems.

ACTION 15

Develop research on the mechanisms by which antibiotic resistance emerges and is transmitted, in facilities that keep animals or handle food of animal origin

Key players: ANSES, French veterinary schools

Timeframe: Action throughout the plan

Over the next 5 years, we should gain a better understanding of the precise mechanisms involved in the emergence and transmission of antibiotic resistance through the funding of research projects. These will focus on the emergence and transmission of resistance in facilities that keep animals or handle food of animal origin, such as farms, veterinary clinics and slaughtering and butchery services. We can also gain better understanding of these mechanisms by developing Whole Genome Sequencing methods, or rapid detection tools based on data from such sequencing, which will provide a more accurate understanding of the mechanisms by which these types of resistance emerge and are spread.

ACTION 16

Better understand the science underpinning cross-resistance between antibiotics, other antimicrobials and biocides in animal health

Key player: ANSES

Timeframe: Action throughout the plan

The Ecoantibio 3 plan will also help us to better understand the science behind cross-resistance between antibiotics and other antimicrobials, as well as cross-resistance between antibiotics and biocides. These results will then be translated into concrete guidelines for using antimicrobials and biocides in facilities that keep animals or handle food of animal origin, such as farms, veterinary clinics, slaughtering and butchery services and the food industries.

ACTION 17

Monitor resistance and exposure to antibiotics in a “One Health” and regional approach

Key player: ANSES

Timeframe: Action throughout the plan

In order to better understand the mechanisms of transmission of antibiotic resistance between the different compartments, antimicrobial resistance surveillance will be rolled out in animal health and in wildlife. In line with the interministerial roadmap to fight antimicrobial resistance, this surveillance will seek to produce cross-sectoral “One Health” indicators, and promote the interoperability of data in the human and animal health domains, without however developing indicators beyond the animal sphere. The surveillance of antibiotic exposure and resistance will also be scaled so as to provide regionalised data. The improvements to this surveillance can be based on data collected by the Calypso system.

ACTION 18

Develop research on antimicrobial and antiparasitic resistance

Key players: ANSES, RFSA, French veterinary schools

Timeframe: Action throughout the plan

Ecoantibio 3 must also aim to better understand the phenomena of resistance to other antimicrobials and antiparasitic agents used to treat the most common pathologies. Within the next 5 years, the aim is to determine the major pathogen/antimicrobial (non-antibiotic) agent and parasite/antiparasitic pairings for each sector. A study will be conducted to set out the quantitative indicators of exposure to other major antimicrobials and antiparasitics, as well as indicators of resistance.

Strategic priority 4

Maintaining, improving and developing a therapeutic arsenal that promotes the proper use of antimicrobials and optimises prescribing practice in animal health

A diverse and innovative therapeutic arsenal is needed in the fight against antimicrobial resistance. Strategic priority 4 ensures the conditions for maintaining a wide range of antimicrobial therapies (Action 19), anticipating the consequences of Marketing Authorisation (MA) withdrawals and the phenomena related to delayed use of antibiotics on antibiotic resistance (Action 20). The plan will support innovation to improve the existing arsenal and develop new active antimicrobial substances, alternative medicines and preventive approaches, such as vaccines (Action 21). Once evaluated for efficacy, the use of complementary medicines will be facilitated (Action 22).

The actions in strategic priority 4 primarily focus on antimicrobials.

ACTION 19

Ensure that conditions are met for veterinary pharmaceutical companies to be able to offer a diverse and effective therapeutic arsenal of antibiotic therapies at national and European level

Key players: SIMV, AVEF, AFVAC, SNGTV

Timeframe: Action throughout the plan

The Ecoantibio 3 plan aims to maintain the efficacy of the existing therapeutic arsenal in animal health. Practitioners will be reminded of the different therapeutic options via technical veterinary organisations, in order to combat the problems related to delays in the supply of certain antibiotics such as amoxicillin, alone or in combination with clavulanic acid. A review will be conducted of economic instruments that could be mobilised on a European and national scale to prevent Marketing Authorisations for antibiotics from being withdrawn in animal health. This is related to the work done as part of the interministerial roadmap and supported by investigations already completed by France as part of the SRSP project⁷.

ACTION 20

Anticipate the consequences of stopping the use of an antibiotic active ingredient on antibiotic resistance phenomena, including in the context of drug shortages

Key player: ANSES

Timeframe: Within 5 years

In order to be able to anticipate the consequences of permanently or temporarily discontinuing the use of an antibiotic active ingredient in the event of shortages, studies will be conducted under the auspices of ANSES to understand the possible effects of such discontinuation in terms of antibiotic resistance in animal health. This data will be useful for decision-makers should shortages occur, if an MA is at risk of withdrawal, or there is a move to ban an active antibiotic substance in animal health.

7. Structural Reform Support Programme (SRSP), now a Technical Support Instrument - TSI): <https://www.who.int/groups/mitigating-shortages-of-antibiotics>

ACTION 21

Promote innovation among veterinary pharmaceutical companies to develop new antimicrobial active ingredients, new vaccines for diseases requiring the use of antimicrobials and alternative drugs to be used instead of antimicrobials, on a national and European scale

Key player: SIMV

Timeframe: Action throughout the plan

Based on studies already conducted to identify existing needs and therapeutic gaps in terms of antimicrobial treatments and the vaccines available for diseases requiring the use of antimicrobials, the Ecoantibio 3 plan will promote the development of medicines other than antibiotics. A review will also be conducted into the economic instruments that could be mobilised on a European and national scale to promote innovation in this area. Innovations within the existing arsenal, such as improving a dosage regimen or limiting the presence of antimicrobial waste in the environment, will be promoted for both pets and livestock. This action will be carried out - when deemed appropriate - in close coordination with the guidance and actions in the interministerial roadmap.

ACTION 22

Facilitate the use of pre-evaluated complementary medicine in veterinary medicine

Key players: FSVF, ANMV

Timeframe: Action throughout the plan

A study will be conducted to evaluate the benefit of complementary medicines, such as aromatherapy and herbal medicine, over antibiotics. It will aim to identify the practices and methods of their use and analyse, in collaboration with DGAL, whether or not changes need to be made to the regulatory framework concerning these substances, providing they are found to be harmless to consumer, animal and environment. Clinical information sheets could be proposed and guides for proper use could be created for veterinarians and livestock and pet owners.

Strategic priority 5

Combating antimicrobial and antiparasitic resistance in animal health, on a regional and international scale

Strategic priority 5 seeks to ensure that the Ecoantibio 3 plan has an impact at all levels. As such, the fight against antimicrobial and antiparasitic resistance must be further consolidated at a regional level, including regional governance (Action 23). Antimicrobial resistance does not recognise borders and so France must advocate for their proper use on a European (Action 24) and international (Action 25) scale.

Strategic priority 5 is focused on resistance to antimicrobials and antiparasitics.

ACTION 23

Implement regional roadmaps for the Ecoantibio 3 plan

Key players: DGAL

Timeframe: Within 5 years

Region-specific roadmaps of the Ecoantibio 3 plan could be rolled out over the next 5 years, based on an upcoming technical instruction from DGAL, and under the guidance of DRAAF (French regional department of food, agriculture and forestry) and DAAF (French overseas departments and territories department of food, agriculture and forestry). This will mean that actions adapted to specific regional features can be implemented and will open up spaces for communication among professionals on the ground. Conversations between government departments will be encouraged in a "One Health" approach, in relation to the deployment of the interministerial roadmap.

ACTION 24

Maintain France's role as a driving force against antimicrobial resistance on a European level

Key player: DGAL

Timeframe: Action throughout the plan

France will affirm its role as a catalyst of European action in the fight against antimicrobial resistance, making the topic a long-term priority in Europe, particularly in the implementation of reciprocity measures concerning the use of antimicrobials in livestock farming. France will support the target set by the "Farm to Fork" strategy of achieving a 50% reduction in the use of antimicrobials by 2030. In terms of surveillance, France will support the European EARS Vet⁸ initiative to monitor antibiotic resistance in pathogenic bacteria in veterinary medicine, and will advocate for an integrated analysis of the surveillance data showing antibiotic resistance in imported meat. France will also become more extensively involved in the different European initiatives on the topic which impact animal health, in particular the future joint European action on the fight against antimicrobial resistance - EU-JAMRAI 2⁹.

8. European Antimicrobial Resistance Surveillance network in Veterinary medicine

9. Joint Action on Antimicrobial Resistance and Healthcare-Associated Infections

ACTION 25

Promote international cooperation in the field of antimicrobial resistance

Key player: DGAL

Timeframe: Action throughout the plan

On an international scale, France will continue to advocate for a ban on the use of antibiotics as a growth factor and the importing of food products of animal origin from livestock bred using these methods. To this end, it will pursue and develop international training actions resulting from the different collaborative actions it undertakes. It shall support the action of the WOAHA and more broadly speaking, the quadripartite alliance, on the topic, in particular within the context of the nomination of ANSES as an FAO Reference Centre for Antimicrobial Resistance. France will support ongoing efforts to mobilise the Codex alimentarius, beyond the adoption, in November 2021, of the Code of practice to minimize and contain antimicrobial resistance (COP) and the Guidelines on Integrated Monitoring and Surveillance of Foodborne Antimicrobial Resistance (GLIS).

Appendix



Evolution of ALEA indicators by species between 2011 and 2022¹⁰

The ALEA (Animal Level of Exposure to Antimicrobials) indicator estimates the level of animal exposure to antibiotics. Exposure to antibiotics has dropped for all food-producing species since 2011: -23% for beef (Figure 1), -67% for pork (Figure 2), -72% for poultry (Figure 3), -64% for rabbits (Figure 4). The level of exposure of cats and dogs in 2022 is close to the figure estimated in 2011 (-3%) (Figure 5).

Figure 1. Exposure of cattle to antibiotics between 2011 and 2022 (ALEA indicator)

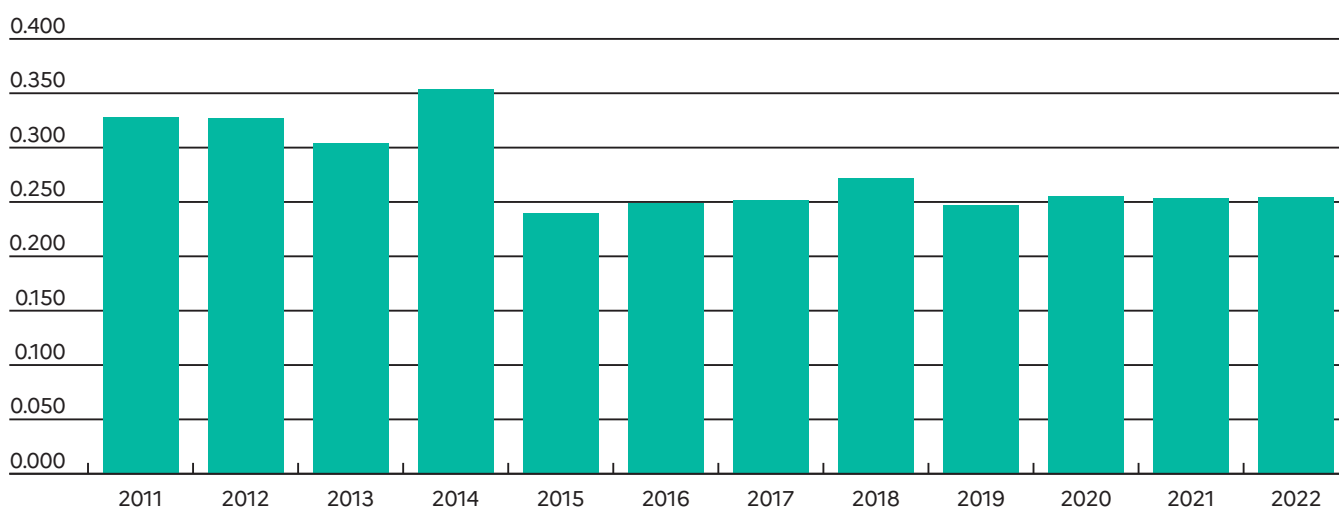
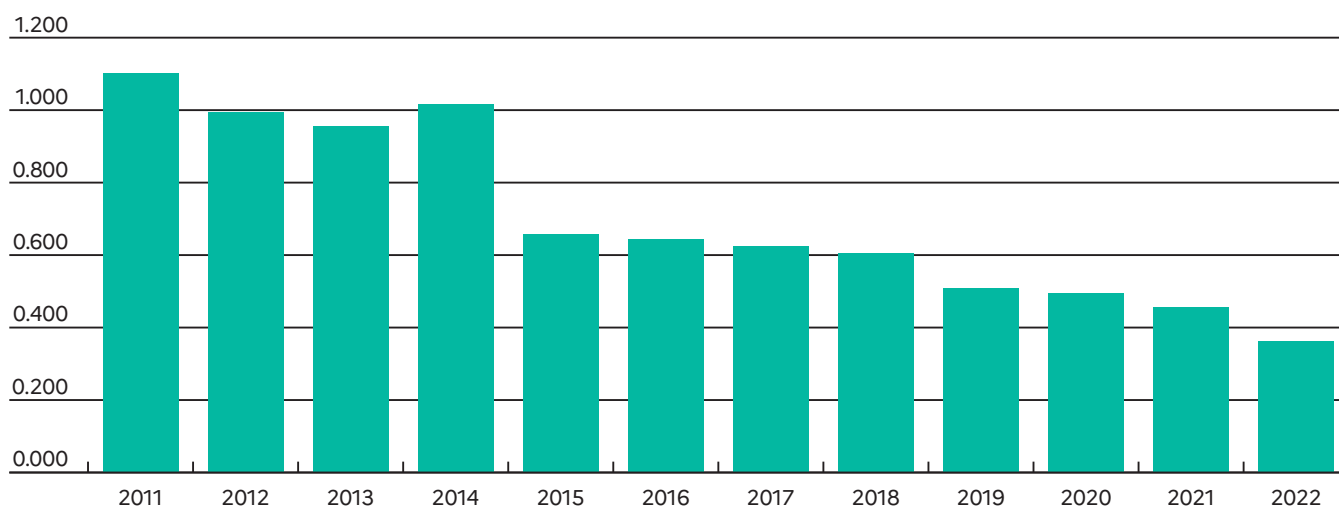


Figure 2. Exposure of pigs to antibiotics between 2011 and 2022 (ALEA indicator)



10. According to monitoring of the sale of veterinary medicines containing antibiotics in France in 2022, carried out by ANSES.

Figure 3. Exposure of poultry to antibiotics between 2011 and 2022 (ALEA indicator)

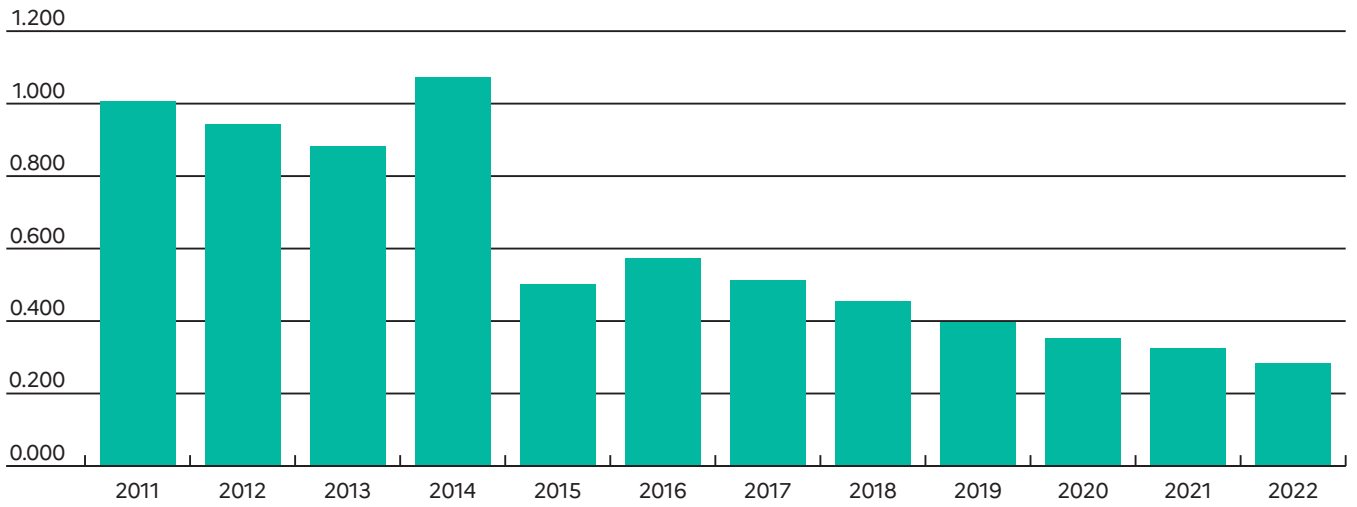


Figure 4. Exposure of rabbits to antibiotics between 2011 and 2022 (ALEA indicator)

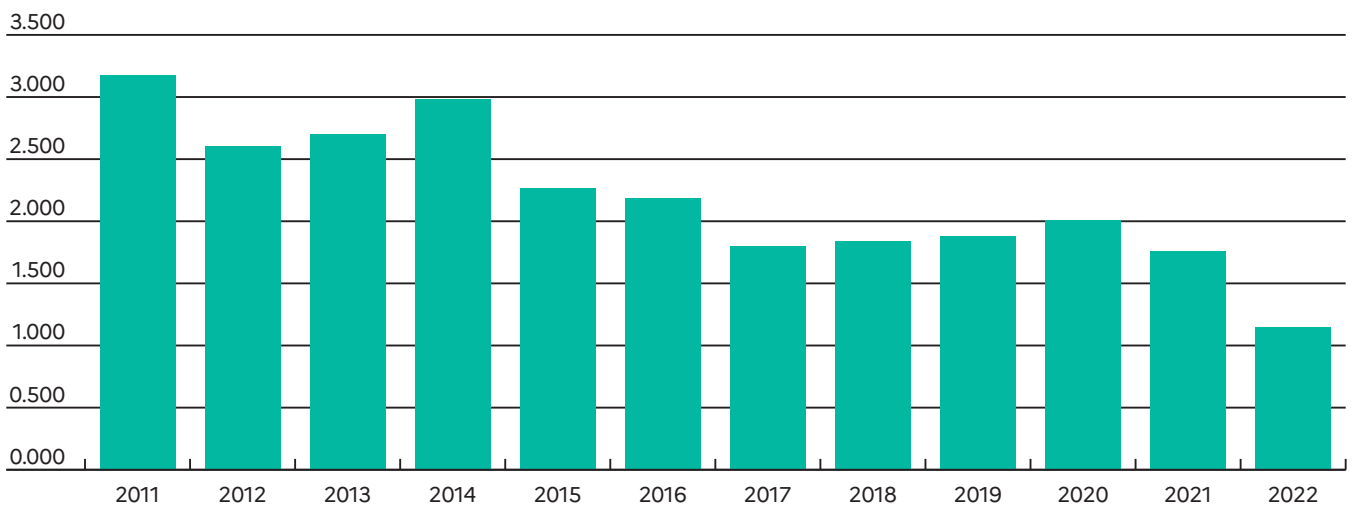
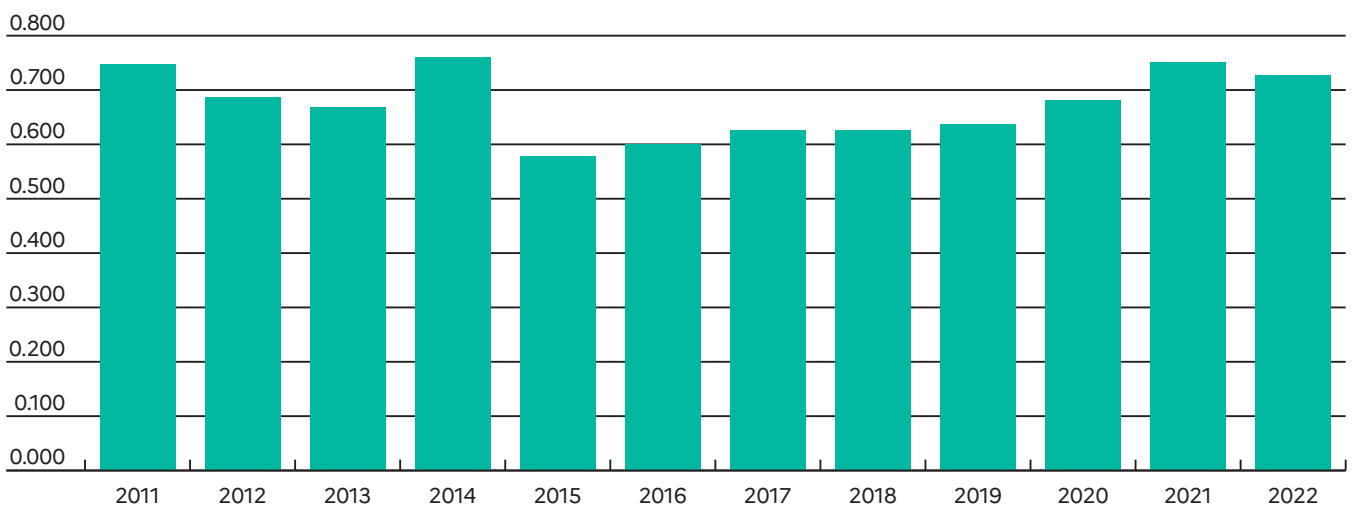
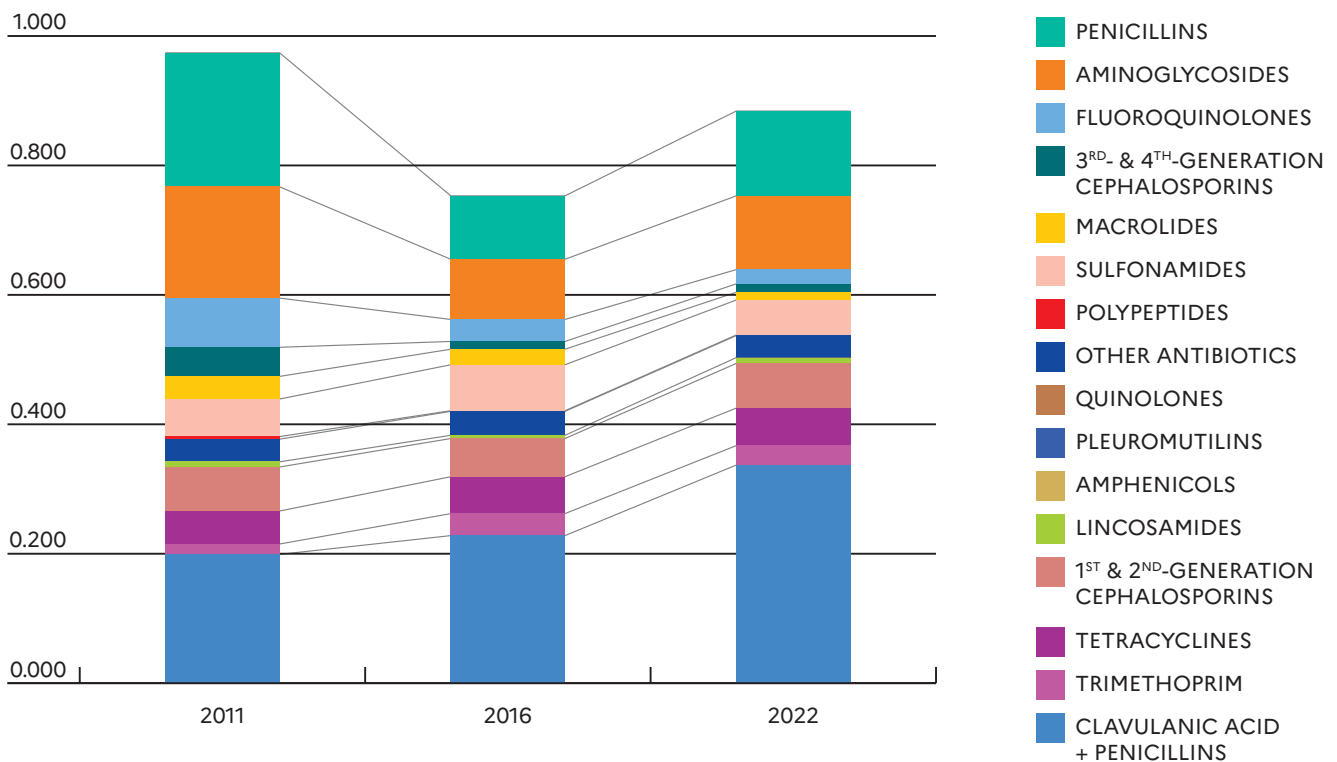


Figure 5. Exposure of cats and dogs to antibiotics between 2011 and 2022 (ALEA indicator)



After a drop of 19.5% between 2011 and 2016, the level of exposure of cats and dogs to antibiotics has increased over the last few years (+21.0% in comparison with the ALEA of 2016) (Figure 6). The level of exposure of cats and dogs to antibiotics is close (-2.6%) to the figure estimated in 2011. After a drop of 19.5% between 2011 and 2016, exposure to Penicillin has significantly increased in recent years. This exposure more specifically concerns pills combining amoxicillin with clavulanic acid: the level of exposure for these pills in 2022 was 83.8% higher than that in 2011 and 47.8% higher than that in 2016. These treatments now represent 46% of total exposure of cats and dogs in 2022.

Figure 6. Exposure of cats and dogs by family between 2011 and 2022 (ALEA indicator)



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