Activities and achievements regarding the reduction of antibiotics use and resistance in animals in Belgium 2016-2020




Contents

Context

Antimicrobial resistance (AMR) is a worldwide problem in public and animal health that concerns academics, policymakers and all stakeholders involved with human and veterinary medicine. To a greater or lesser extent, AMR of microorganisms can reduce the efficacy in treating infections, and in some cases can even make treatment extremely problematic.

Antibiotic use is the main cause of AMR. Reducing the use of antibiotics in animals is a shared responsibility of the sectors and governments concerned. This is the impetus behind the drive for all parties involved in veterinary medicine in Belgium to share efforts to develop and implement appropriate actions.

Summary

This report summarises the main activities and achievements carried out from the time that the Antibiotics Covenant was signed in 2016 up to the end of 2020 by the various actors in veterinary medicine as a means of promoting the reduction in the use of antibiotics. In addition, the report contains figures regarding the sales of antibiotics on a national level and about their use at farm level, as well as on the development of AMR in animals during the 2011-2020 period.

The year 2016 is considered to form a turning point in Belgian policy governing the use of antibiotics in veterinary medicine, due to the fact that three milestones were reached that year: the signing of the first Antibiotics Covenant between the Federal Government and the relevant organisations in the sector; the publication of a Royal Decree governing the use of critically important antibiotics and the registration of the use of antibiotics; and finally, the establishment of Sanitel-Med, the Federal Government's database in which those registrations must be entered.

In 2020, the final year of the first Antibiotics Covenant, it is time to focus on the results achieved during the period now coming to an end. Unfortunately, the result at the end of 2020 does not confirm the trend established at the end of 2019: total sales of antibiotics and of medicated feed containing antibiotics stagnated in 2020 and at the end final reductions of respectively 40.2% and 70.4% were reached compared to 2011. In 2020, sales of critically important antibiotics actually increased compared to 2019. The overall reduction of these critically important antibiotics is still 70.1% compared to 2011. **By way of a conclusion with regard to the three reduction targets of Vision 2020 and the Antibiotics Covenant, only the target for medicated feed containing antibiotics was achieved. The Federal Government and the sector organisations concerned are unhappy with these results, but their responses provide a positive signal for the future. This trend must be reversed and the commitment to achieve this has already materialised with the signing, in early 2021, of a second Antibiotics Covenant, which sets out new and ambitious targets to be achieved by the end of 2024.**

Moreover, since 2011, there has been a downward trend in AMR in indicator and zoonotic bacteria in food-producing animals with regard to the prevalence of resistance. **This is a favourable result that has strengthened the conviction of all partners to continue reducing the use of antibiotics.**

Covenant 2016-2020 between the Federal Government and all relevant sector partners regarding the reduction in the use of antibiotics in the animal sector

The 'Covenant between the Federal Government and all relevant sector partners regarding the reduction in the use of antibiotics in the animal sector', which was signed on 30 June 2016, lists the following strategic objectives:

1. a 50% reduction in the general use of antibiotics by 2020
2. a 75% reduction in the use of critical antibiotics by 2020
3. a 50% reduction in medicated feed containing antibiotics by 2017.

The year used as a benchmark for the reduction targets is 2011. These objectives match AMCRA's reduction targets, as described in its 'Vision 2020'.

The Covenant was signed by the Federal Government, represented by the Ministers of Public Health and Agriculture, the pharmaceutical industry (pharma.be), agricultural organisations (ABS, Boerenbond and FWA), compound feed industry (BFA), veterinary associations (UPV and VDV), animal health associations (ARSIA and DGZ), managers of private quality systems and sector guides (Belplume, Belpork, BVK, Codiplan, IPW IKM/QFL/QMK) and the AMCRA.

On 30 June 2016, the Antibiotics Covenant was signed by representatives of the sector partners and by the Ministers of Public Health and Agriculture, Maggie De Block and Willy Borsus.

Achievements related to the commitments made by member sectors and the Government as part of the Antibiotics Covenant 2016-2020

The Federal Government, the AMCRA and the sector partners concerned defined joint operational objectives within the Antibiotics Covenant. Specific commitments were also defined in Annex 4 of the Antibiotics Covenant.

In the case of the Federal Government and the sector partners involved, this document reports on several key achievements that took place between 2016 and 2020 in the context of the first Antibiotics Covenant. For more information and an extensive description of all the results achieved, we refer you to the respective organisations.

Federal Government

The fight against antimicrobial resistance in animals was accelerated by the Royal Decree (RD) of 21 July 2016. Amongst other things, the registration in a central database of the use of antibiotics in those animal species with the highest consumption became mandatory. Conditions were also laid down for the use of critically important antibiotics. During the past five years and thanks to the smooth cooperation between the FASFC, the FAMHP and the FPS-HFCE and by means of the financial support provided to the AMCRA, the Federal Government has been able to focus on raising awareness amongst livestock farmers and vets, with the help of benchmarking on the use of antibiotics. Special attention was also paid to cooperation with and support for the sectors (=co-regulation) in order to achieve the reduction objectives on the basis of the covenant and its management committee.

The monitoring of antimicrobial resistance was continued on an extensive scale and particular attention was paid by the FASFC and the FAMHP to checking compliance with the Royal Decree of 21 July 2016. Under the coordination of the FPS-HSFCE, an ambitious One-Health National Action Plan to combat antimicrobial resistance (OH NAP AMR) has been set up, defining all strategic and operational objectives related to AMR and in which the covenant and its management committee play an important role in the case of the animal pillar.

Combating AMR also forms a major focus of two new European regulations, namely Regulation (EU) no 2016/429 on transmissible animal diseases (Animal Health Law) and Regulation (EU) 2019/06 on veterinary medical products. Elements in support of the fight against AMR will also be optimised or added to the amended (and other) national legislation to be published during 2021-2022. Investments are also being made to expand data collection, benchmarking and analysis and, in the case of food-producing animals, a greater focus will be placed on prevention (biosecurity and the farm health plan) and on the remediation of farms which are in the alert zone (coaching). Ultimately, the pet animals sector will also be more closely involved in the fight and the political validation of the OH NAP AMR is under way.

Pharmaceutical industry

In 2019, pharma.be continued to build on the activities in the area of education and awareness-raising that had been started in the past. For example, the e-formulary will remain available to veterinarians free of charge, so they can use it in their everyday practice. Awareness-raising among members of pharma.be and their employees is also continuing, including through the e-learning module ‘Proper use of antibiotics’. Finally, pharma.be remains an active partner within the AMCRA and its members

finance both data collection on the use of antibiotics and research into alternatives that can be used to help reduce the need for antibiotics.

Source: UGent

Compound feed industry

The compound feed industry complies an inventory of the production of medicated feed for livestock destined for the Belgian market and defines actions to encourage a reduction in their use. The reduction target set specifically for the compound feed sector (50% less medicated feed containing antibiotics by the end of 2017) was comfortably achieved by the end of 2017. This reduction is the result of very efficient sector-based initiatives (such as the annual benchmarking of members, electronic prescriptions, a ban on the use of colistin in medicate feed, individual supervision of manufacturers making heavy use of antibiotics and commitment to cross-sector initiatives, etc.). In the BFA sustainability charter, the BFA remains ambitious to continue to drive the reduction in the use of antibiotics. This includes the new objective to achieve a 75% reduction in the use of medicated feed containing antibiotics by 2024 (compared to the reference year 2011).

Agricultural organisations

In the opinion of the ABS, the Boerenbond and the FWA, data collection and on-farm usage reports remain a very important tool that enables us to move in the direction of sustainable antibiotic use both now and in the future. As a result of this, livestock farmers are very closely involved in the well-considered use of antibiotics and are able to implement possible management adjustments in consultation with the veterinarian. Raising awareness and providing alternatives remains a very important task for agricultural organisations, the government, the scientific world, the AMCRA and other partners. The agricultural organisations have invested in doing precisely that and are continuing to invest in communication, training and the support and rolling out of the data collection system by means of the AB Register and BIGAME.

Veterinary organisations

In 2020, the 'Union Professionnelle Vétérinaire' (UPV) and the new professional association VeDa have continued their commitment by taking part in various AMCRA working groups. Veterinarians played an active role in the development of the animal part of the One Health Action Plan to combat AMR. They were also active on European platforms such as the "Federation of the Veterinarians of Europe" (FVE), on which the antibiotic issue is regularly discussed.

Various courses were organised for veterinarians on the topic of the 'responsible use of antibiotics.' Emphasis was placed on preventive veterinary medicine and the application of good biosecurity in all animal sectors. The evolution from curative to preventive veterinary medicine also requires the veterinarian to play an adapted role and to act more as an advisor and confidant to livestock farmers.

In January 2021, SAVAB-Flanders and UPV VeDa joined the AMCRA as active members.

The UPV has invested more than ever before in the fight against antibiotic resistance. For example, one of the things it is doing is take part in the AMCRA advisory board in order to contribute towards informing and educating veterinarians about the use of antibiotics. Important dossiers from the past few years relate to the commitment to and the promotion of the convention for the reduction of the use of antibiotics in production animals. Various studies on resistance in companion animals are also under way, including a communication campaign in waiting rooms on the responsible use of antibiotics. UPV has promoted the training on the use of antibiotics within FORMAVET's training programmes.

All veterinarians' organisations are working together to provide information and communicate various topics to their members.

Source: Dr. Zyncke Lipkens

Managers of private quality systems and sector guides

In 2020, a new quality system, **BePork**, was developed, a merger of **Certus** and **CodiplanPLUS**. BePork is a unique, generic quality manual which brings together the non-statutory standards of both specifications. The quality system unites all the players in the pig sector and already covers 80% of the production of pigs (and pork meat). The antibiotics policy initiated within Certus was adopted and is undergoing further refinement within BePork. Participants record their use of antibiotics in the AB Register database and receive a farm report four times a year, which provides an insight into the qualitative and quantitative use of antibiotics on their farm. In order to evaluate measures taken more quickly and efficiently and to adjust them where necessary, participants can also consult their antibiotic use at any time via the Nearly Real Time reporting tool on their AB Register portal. Within BePork, the long-term high users are now also identified. It has been decided to digitalise the action plan that they draw up. Finally, the creation of a farm health plan was also developed, by means of which BePork aims to take a more proactive approach towards animal health.

Codiplan vzw, the manager of the sector guide for animal production, included in that sector guide a chapter entitled "Use of antibiotics", which is devoted to the problem of bacterial resistance and the legal provisions concerning the use and registration of critically important antibiotics. The guide also explains the AMCRA 2020 objectives, with reference to the guides prepared by the AMCRA concerning the proper use of antibiotics and farm health. This sector guide is also the basic requirement for certification for the CodiplanPLUS Pig quality system, which is also managed by Codiplan. This includes the compulsory registration of AB in the appropriate databases.

The **Belbeef** Standard, which is managed by the sectoral organisation, Belbeef vzw, promoted the voluntary registration of antibiotics in Sanitel-Med by the veterinarian of participating livestock farmers. In addition, the sustainability monitor was also launched and evaluated through participating livestock farmers. This monitor contains several initiatives that are directly related to the prevention of antibiotic use (a contract with the veterinarian accompanying the farm, biosafety measures and disease prevention, purchasing policy, etc.).

In early 2019, in collaboration with AMCRA, work got under way on the content of the periodic poultry report. On 10/04/2019, **Belplume** sent out a periodic report for the first time. Since then, Belplume has been actively working on improving data quality: poultry farmers with error reports have been contacted, hatcheries and veterinarians have been closely involved, software adjustments have improved links and pre-analyses prior to a report have provided additional insight and solutions. This has resulted in a decrease in the number of error reports. In addition, the content of the antibiotics report was continuously optimised and modified. At the end of 2019, Belplume worked on developing ‘the major user plan’ and ‘the farm health plan’ that has come into force in the meantime.

The compulsory registration of antibiotics on dairy farms started on 1 October 2018 (by means of the AB Register in Flanders and BIGAME in Wallonia) in connection with the **IKM/QFL/QMK** specifications book. In 2020, the dairy farms received the first benchmark report. The first sector report gives the sector an overall insight into the total use of antibiotics and extensive communication with veterinarians and dairy farmers took place by means of newsletters and articles in the trade press.

All initiatives taken by the **Belgian veal calf sector (BVK)** have been compiled in the ’10 point plan for the rational use of antibiotics in veal calves’. The basis for the implementation of the 10-point plan is the expanded antibiotics database and the benchmarking of veal farms and batches of veal calves. The 10 specific points included in the plan form the basis that enables for all parties involved to work

deliberately and systematically towards a more rational use of antibiotics in veal calves. The 10 point plan has also been progressively incorporated into the BCV Charge Book, providing independent, external oversight of the actual implementation of the 10 agreed measures.

Source: ©Didier Vanmollekot

Animal health associations (DGZ – ARSIA)

DGZ and ARSIA have recently been working closely together on the development of an application for the farm health plan. The application allows the farm's veterinarian, in consultation and interaction with the livestock farmer at each farm visit, to record and follow up on specific actions and thereby improve the health of the farm. With the support of the FASFC, a 'biosafety audit' module (based on the Biocheck.UGent questionnaire) will be linked to the application allowing porcine veterinarians to follow up biosafety annually from 2021 onwards.

Furthermore, active efforts are being made to support livestock farmers and veterinarians, for example by publishing newsletters and articles and by giving (digital) lectures and workshops. DGZ and ARSIA are also playing a key role in determining the sensitivity of bacteria isolated from samples taken from animals that are clinically ill.

Since 2016, ARSIA has been fully committed to the Antibiotic Covenant by developing an unprecedented, cross-cutting support and guidance strategy under a single name: "Altibiotique", a deliberate nod to the preventive scope of their actions with the aim of reducing the use of antibiotics on livestock farms by reducing the prevalence of pathologies. Theoretical and practical training, audits and on-site visits, the development of computer tools and analysis of data from livestock farms, as well as free antibiograms and the development of the production of auto-vaccines are some of the actions and services that ARSIA has developed for its livestock farmers and veterinarians. They are committed to working with them on a daily basis in the fight against antibiotic resistance and are constantly improving their tools, such as BIGAME. This tool can now provide users with a full report on antibiotic use on farms, combining indicators from ARSIA with those proposed by AMCRA. “Ensemble, pour aller plus loin”. (Working together to get further)

With the presentation of the Bio-safety Award in February 2020, the DGZ shone a spotlight on cattle farmers who invest in a bio-safe farm in an innovative and/or creative way. In this way, the DGZ wants to encourage other livestock farmers to follow their example.

As one of the founding members of the data-sharing platform DjustConnect, DGZ is also making its contribution towards the opening up of relevant farm data on a much broader basis than at present, with the aim, among other things, of being able to make better causal connections and gain more effective insights into the animal health and sustainability aspects that exist within the livestock farming sector in Belgium. DGZ is involved in various projects and control and monitoring programmes with the aim of further focusing animal health care on prevention. Among other things, the DGZ is a partner in the European project ROADMAP (Rethinking Of Antimicrobial Decision-systems in the Management of Animal Production).

AMCRA

AMCRA is the centre of knowledge on antibiotic consumption and resistance in animals in Belgium. AMCRA's advice and communication unit acts as a catalyst for the responsible use of antibiotics through communication and raising awareness of the target audience. Numerous activities were organised in collaboration with partner organisations and the government (communication campaigns, information events, articles in the specialist press, etc.). An important function of AMCRA is to advise the various stakeholders. Technical working groups are being set up to formulate recommendations on the responsible use of antibiotics. Specifically for veterinarians and students of veterinary medicine, the Formularium has been drawn up, which contains guidelines on antibiotic therapy for cattle, pigs, poultry, horses, dogs and cats.

The AMCRA 'data analysis' unit has been commissioned by the FAMHP to analyse data on the use of antibiotics that has been collected in the Sanitel-Med data collection system. AMCRA also seeks to cooperate with the sectors that wish to provide additional services to the users of the AB Register and BIGAME data collection systems. The methodology for data analysis, benchmarking and reporting was published on the AMCRA website (https://www.amcra.be/nl/analyse-antibioticumgebruik/). Based on the usage data collected in Sanitel-Med, AMCRA established the reduction pathways for pigs, broilers and veal calves. The reduction pathways were drawn up in consultation with the sectors and were included in the second Antibiotics Covenant. The reduction pathways will lead the sectors to reduce the use of antibiotics and to ensure that the number of users that have formed the subject of an alert is reduced to a maximum of 1% by the end of 2024.

Reduction pathways for pigs, veal calves and broiler chickens from 2021 to the end of 2024.

	Suckling piglets	
	Attention value	Action value
01/01/2021	2	10
01/01/2023	2	6
01/01/2024	**2**	**5**

	Weaned piglets	
	Attention value	Action value
01/01/2021	14	50
01/01/2023	14	40
31/12/2024	**14**	**30**

	Fattening pigs	
	Attention value	Action value
01/01/2021	2,7	9
01/01/2023	2,7	6
01/01/2024	**2,7**	**6**

	Sows	
	Attention value	Action value
01/01/2021	0,28	1,65
01/01/2023	0,28	1,65
01/01/2024	**0,28**	**1,65**

	Veal calves	
	Attention value	Action value
01/01/2021	10	15
01/01/2023	9	13
31/12/2024	**8**	**11**

	Broilers	
	Attention value	Action value
01/01/2021	6	14
01/01/2023	5	12
31/12/2024	**5**	**10**

Covenant 2021 - 2024 on the responsible use of antibiotics in animals, established between the Federal Government and all partners involved in the fight against antimicrobial resistance

Early 2021, the second Covenant was signed by the Federal Government, represented by the Ministers of Public Health and Agriculture, the pharmaceutical industry (pharma.be), agricultural organisations (ABS, Boerenbond and FWA), compound feed industry (BFA), sector organisations (Landsbond Pluimvee and VEPEK), veterinarians' associations (UPV, VeDa, SAVAB-Flanders), the regional boards of the Order of Veterinary Surgeons (CRFOMV and NGROD), animal health associations (ARSIA and DGZ), managers of private quality systems and sector guides (Belplume, Belpork, Belbeef, BVK, Codiplan, IPW IKM/QFL/QMK) and the AMCRA.

The text contains 4 strategic objectives that correspond to the reduction targets described by AMCRA in the 'Vision 2024':

1. The overall use of antibiotics must not exceed 60 mg/PCU by the end of 2024, which corresponds to a 65% reduction compared to the year 2011[1];
2. The use of colistin must not exceed 1 mg/PCU by 2024;
3. A 75% reduction from 2011 levels in the use of medicated feed containing antibiotics by the end of 2024;
4. To maintain each year, as a minimum, the 75% reduction already obtained compared to 2011 with regard to the use of critically important antibiotics (fluoroquinolones and 3rd and 4th generation cephalosporins).

In the case of food-producing animals and veal calves, pigs and broilers in particular, animal-specific strategic targets will be set, the aim of which will be to enable the number of users that have formed the subject of an alert is reduced to a maximum of 1% for each animal category by the end of 2024.

In the case of household pets, the aim, by 2022, is to develop a methodology for evaluating the use of antibiotics in pet animals and, following the collection of data for the evaluation of the use of antibiotics in pet animals, to draw up a reduction pathway for reducing the use of antibiotics in pet animals, based on sound data and in line with the reduction targets in the Covenant.

[1] In order to calculate the strategic objectives, data from the annual BelVet-Sac reports are used, expressed in mg of active substance per kg of biomass; in order to calculate of the sector-specific objectives, Sanitel-Med data are used.

Results with regard to the use of antibiotics in animals in Belgium in 2020 and its evolution since 2011.

Sales figures for antibiotics

The use of antibacterial agents in animals in Belgium is monitored annually in proportion to the amount of biomass produced annually. These results are published in the BelVet-SAC report (http://www.belvetsac.ugent.be). It concerns data on sales of antibacterial agents for use in livestock as well as pets. These sales figures do not make it possible to display figures per animal species.

Total use

- ***Intended reduction by the end of 2020: -50%***
- ***Evolution between 2019-2020: +0.2%***
- ***Reduction achieved since 2011: -40.2%***

Compared to 2019, a very slight increase of 0.2% (mg substance/kg biomass) was observed in 2020. This is due to a +0.2% increase for pharmaceuticals and +4.0% in premixes, together with a +2.64% increase in biomass. In 2020, sales of the widely used penicillins and the combination sulphonamides-trimethoprim increased slightly by 2%, as did macrolides which increased by 8.1%. The use of 1st and 2nd generation cephalosporins again increased by 19.8% after displaying a significant increase in the previous year. A decrease was also recorded in sales of polymyxins (-11.3%), tetracyclines (-5.9%) and aminosides (-6.5%). Compared with 2011 (benchmark year), a **cumulative decrease of 40.2%** in the total usage was recorded in 2020. This means that, for the first time, the persistent decreases over the last five years are being halted. As a result, the cumulative decrease was not ongoing in 2020 and reached a status quo compared to one year earlier. As a result, it must also be concluded that the proposed reduction of 50% by the end of 2020 was not achieved. Although a 40% reduction is a significant result, the trend will have to be reversed to achieve a further reduction in the coming years.

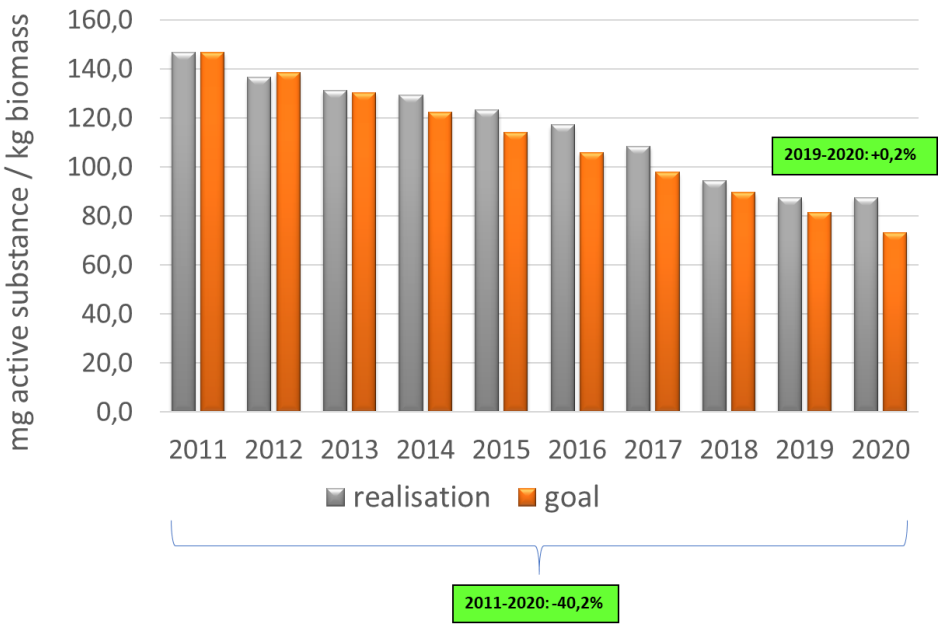

Figure 1: The annual reduction pathway assumed by AMCRA in order to reduce the total use of antibiotics between 2011 and 2020 (orange bars) and the actual reduction figures achieved between 2011 and 2020 (grey bars).

Colistin and zinc oxide

The continuing decrease in the use of polymyxins (primarily colistin) in veterinary medicine in the past 8 years is a very good result. Colistin is listed by the WHO as a critically important antibiotic of the highest priority in terms of public health. In 2020, a **cumulative decrease of -71.3%** in use was reported as compared with 2012 (the year before the use of zinc oxide as a medicinal substance was authorised), and a decrease of -11.3% compared to 2019.

The use of zinc oxide as a medication to treat weaning diarrhoea in piglets has been permitted since October 2013 Whereas on the one hand, a reduction of -14.4% in its use was recorded in 2020 in comparison to 2019, there was also a **progressive decrease of -67.0%** in comparison with 2015, the year in which the highest use was recorded since authorisation (87.2 metric tonnes)

Critically important antibiotics

- ***Intended reduction by the end of 2020: -75%***
- ***Evolution between 2019-2020: +32.1%***
- ***Reduction achieved since 2011: -70.1%***

With regard to AMCRA's second objective, namely the 75% reduction in the use of critically important antibiotics by 2020 (fluoroquinolones and 3rd and 4th generation cephalosporins), an increase in the use of fluoroquinolones was observed for the third year in a row (+36.2%). The increase in 2020 is mainly due to an increase in the use of flumequine (+63.6%), but the use of enrofloxacin also increased further by 12.2%. The use of cephalosporins of the 3rd and 4th generation also increased slightly once again (2.3%) following a decrease in several consecutive years.

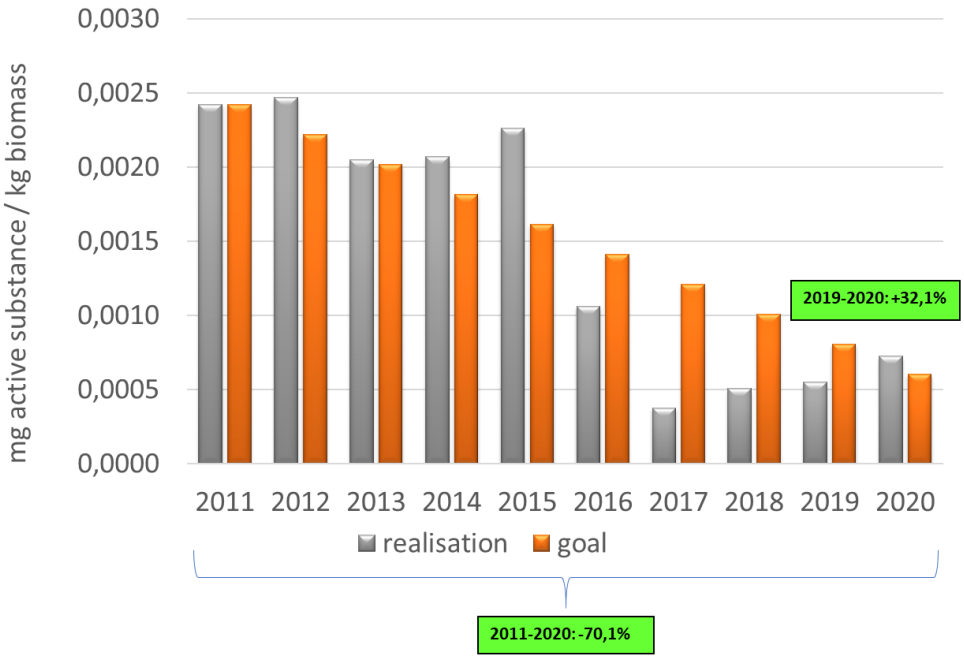

Figure 2: The annual reduction pathway assumed by AMCRA in order to reduce the use of critical antibiotics between 2011 and 2020 (orange bars) and the actual reduction figures achieved between 2011 and 2020 (grey bars).

A cumulative decrease in the use of critically important antibiotics of 70.1% was observed compared to 2011. The initial target of -75% was already achieved at the end of 2016 but had to be sacrificed in

three successive years as a result of increases. A 70.1% reduction is nevertheless a good result, but renewed efforts regarding compliance with the Royal Decree of 21 July 2016 regarding measures on the use of red antibiotics in food-producing animals is intended to lead to a situation in which a reduction of -75% is achieved again.

Medicated feed

- ***Intended reduction by the end of 2017: -50%***
- ***Evolution between 2019-2020: +4.0%***
- ***Reduction achieved since 2011: -70.4%***

The 3rd AMCRA target, a 50% reduction by 2017, which is also included in the Antibiotics Covenant, was already amply achieved in previous years. However, a slight increase of 4.0% was observed between 2019 and 2020. **Ultimately, however, a total reduction of 70.4% can still be recorded since 2011.**

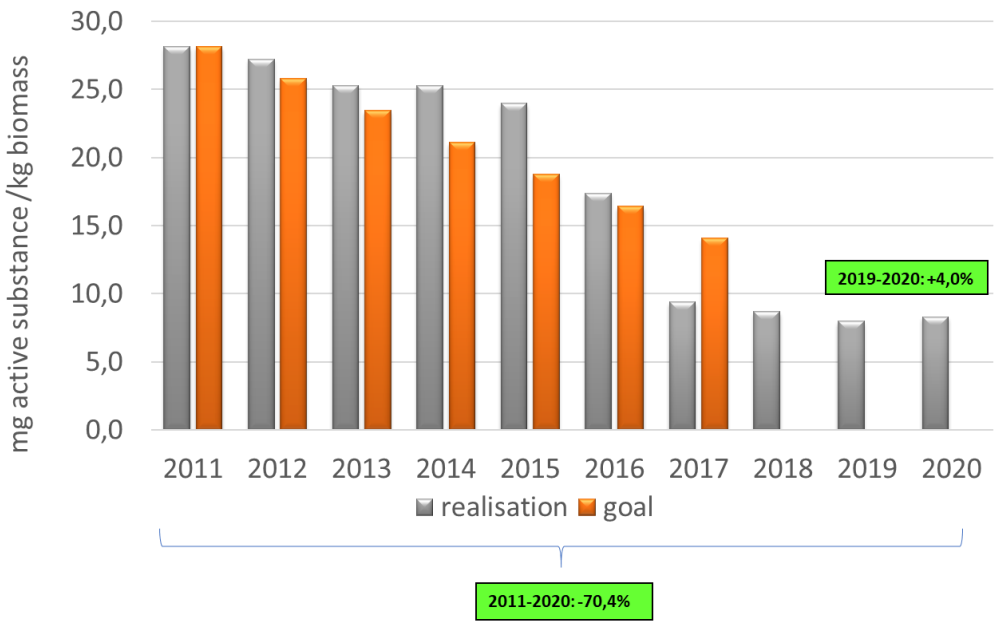

Figure 3: The annual reduction pathway assumed by AMCRA in order to reduce the use of medicated feed containing antibiotics between 2011 and 2017 (orange bars) and the actual reduction figures achieved between 2011 and 2020 (grey bars).

Use according to the AMCRA colour code

Antibiotics with an orange colour code are the most commonly used in terms of mg/kg biomass used. This is mainly due to the fact that the number of antibiotic classes with an orange colour code is higher than the number of those with a yellow colour code. Both the use of antibiotics coded yellow and antibiotics coded orange reflected the status quo in 2019 and 2020. As shown earlier, the use of antibiotics coded red increased in 2020, though their use is still 70.1% lower than in 2011.

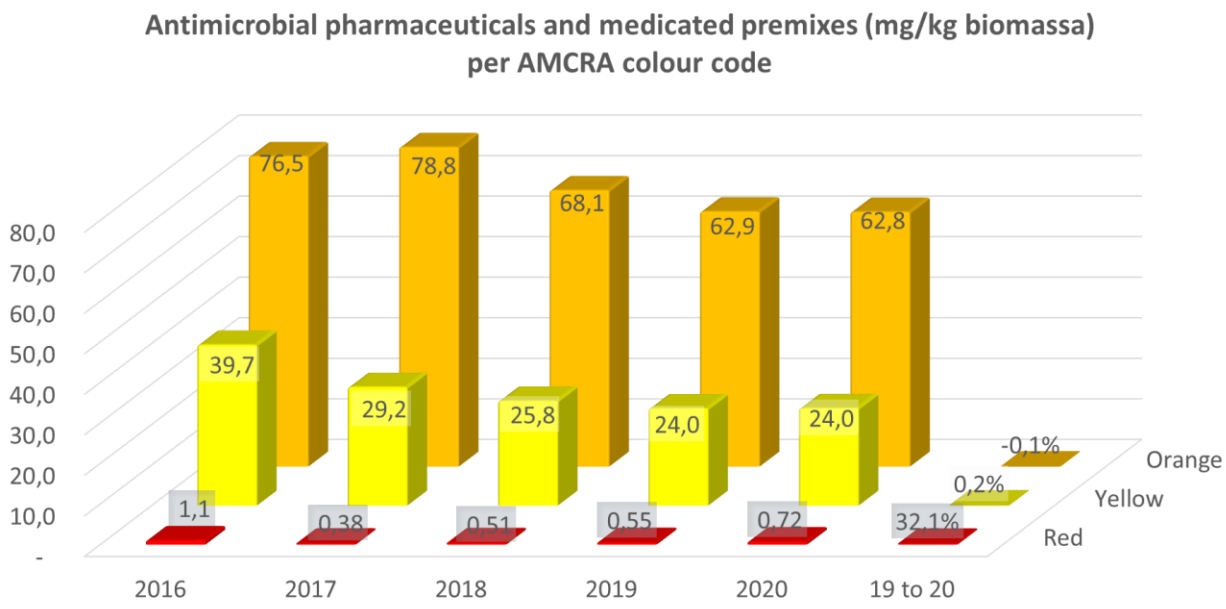

Figure 4: The proportion of products coded yellow, orange or red used in animals in Belgium between 2016 and 2020 and the progression in percentage terms between 2019 and 2020.

Figures regarding the use of antibiotics in pigs, chickens and veal calves

Species-specific antibiotics use information can be shown, thanks to the mandatory registration in Sanitel-Med of all prescriptions, administrations and provisions of antibiotics by veterinarians at livestock farms with pigs, poultry (broiler chickens and laying hens) and veal calves in Belgium (R.D. of 21.07.2016).

Coverage of Sanitel-Med 2020 versus coverage of BelVet-SAC 2020

The information collected in Sanitel-Med covers 77% of the total quantity of active substances sold in Belgium in 2020, according to the BelVet-SAC data (75% of the sales of 'pharmaceuticals'; 93% of sales of medicated feed containing antibiotics). This discrepancy between sales and use figures is largely explained by the fact that the recording of the use of antibiotics in dairy and beef cattle, small ruminants, horses, turkeys, rabbits and other (pet) animals in Sanitel-Med is not yet mandatory at the present time.

Use per animal category in Sanitel-Med

The use of antibiotics is expressed as the number of days an animal receives an antibiotic treatment out of 100 days presence on the farm. This number is called the **TD_{100}** (**T**reatment **d**ays per **100** days) and is calculated for each category of animal: 'nursing piglet', 'weaned piglet', 'sow', 'broiler', 'laying hen' and 'veal calf' (Figure 5). With a median TD_{100} of **19.35**, the use of antibiotics was highest in **veal calves** in 2020. This means that 50% of veal calf farms administer antibiotics to animals on less than 19.35 days in 100 days, but also that 50% of farms administer antibiotics on more days. However, this median TD_{100} of 19.35 represents a 10% **decrease compared to 2019** (21.39) and a 28% decrease compared to 2018. The 'Weaned piglet' category is the one with the second-highest median TD_{100}, of **18.15**. Here, it was established that the figure had **remained steady** compared to 2019 (18.15) and that overall, the figure had decreased by 2.5 compared to 2018. The box plot, which shows the spread

of antibiotic use across the various farms, does show a greater spread among weaned piglets than among veal calves. Whereas the 'basic use' for veal calves is higher, the heaviest users use larger quantities of antibiotics in weaned piglets than in veal calves. Broilers are in third place with a median TD_{100} of **5.35,** which represents a **decrease of 10% compared to 2019** (5.92) and as much as 13% compared to 2018. The category of boars and sows however remained at a median TD_{100} of 0.42 in 2020, which is the same value as in 2019. This means that the increase that took place between 2018 and 2019 has come to an end. Nevertheless, due to the increase in median TD_{100} between 2018 and 2019-2020, an overall increase of 20% was observed between 2018 and 2020. Note, however, that the absolute median values are low within this animal category. Furthermore, a slight increase was reported in the category of nursing piglets (+2%) and a stronger increase in the category of laying hens (+18%). However, both categories have low baseline usage, so despite the increase, low median TD_{100} values were still observed in 2020.

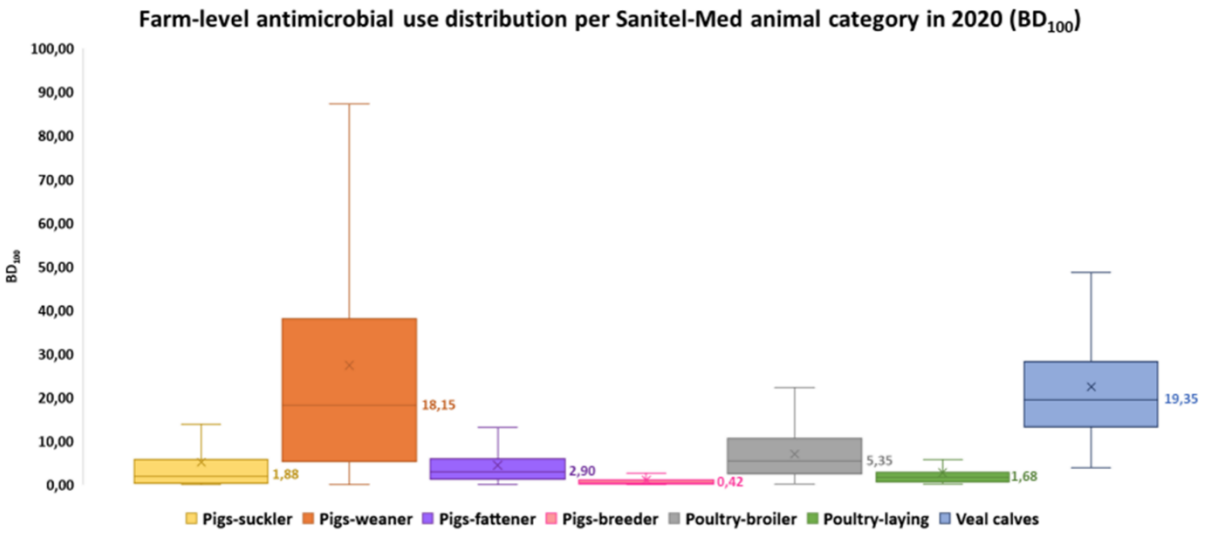

Figure 5: For each animal category, the spread in terms of antibiotic use across the farms with that animal category is shown. The dark line in the box and the number alongside the box are the median: 50% of farms use less and 50% use more.

Antibiotic resistance in indicator and zoonotic bacteria from food producing animals

Context

Since 2011, **antibiotic** resistance in bacteria originating from food producing animals is **monitored annually**. This monitoring is organised by the Federal Agency for the Safety of the Food Chain (FASFC) and is in line with the EU harmonised monitoring carried out since 2014 in accordance with the Implementing Decision 2013/652/EU. ***Escherichia coli* (*E. coli*), an indicator bacterium**, is isolated from fattening pigs, broilers, veal calves and young beef cattle for that purpose. The **prevalence and sensitivity to antibiotics of *methicillin-resistant Staphylococcus aureus*** (MRSA) is also monitored alternately every three years in poultry (starting in 2011), in veal calves, beef cattle and dairy cattle (starting in 2012) and in pigs (starting in 2013) on the livestock farm. In the case of ***Salmonella***, samples are obtained annually within the framework of the national control programme for *Salmonella enterica* in broiler chickens and laying hens.

Results

Changes in antibiotic resistance in Escherichia coli *between 2011 and 2020*

The aim of the monitoring is to monitor the sensitivity of *E. coli* in clinically healthy animals to antibiotics of specific antibiotic classes that are of importance for animal and public health. Figure 6a shows the prevalence of multi-resistant strains of *E. coli*. These strains are resistant to at least 3 different antibiotic classes of the 12 tested. Between 2011 and 2020, multi-resistance was highest among strains from broiler chickens, followed by veal calves, fattening pigs and young beef cattle. **However, a decrease was observed in the occurrence of multi-resistant strains of *E. coli* in 2020, compared to 2011 in all animal species**.

Figure 6b presents the prevalence of fully sensitive strains of *E. coli* following tests to determine sensitivity to 12 different classes of antibiotics. All years concerned, only about 6.1% of the strains of *E. coli* identified in broiler chickens are still sensitive to all 12 of the antibiotic classes tested. Strains of *E. coli* that are totally sensitive occur most commonly in young beef cattle. **The prevalence of sensitive *E. coli* strains increases in fattening pigs (+5.0%), in young beef cattle (+16.0%) and in fattening calves (+11.3%) between 2011 and 2020 but remains constant in the case of *E. coli* from broiler chickens**.

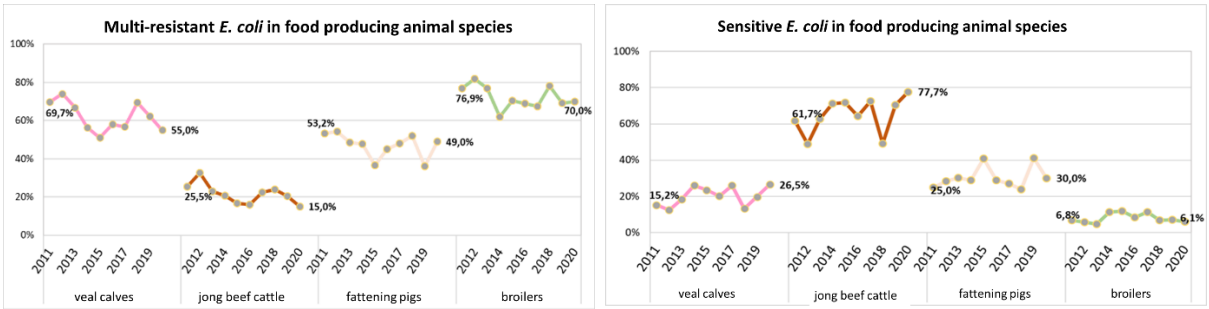

Figure 6 a and b. Changes in the prevalence of multi-resistant (left) and sensitive (right) E. coli in food producing animals in Belgium between 2011 and 2020. Additional information: Number of samples per species = +/- 170; Sampling location and type of sample: for veal calves, fattening pigs and broiler chickens: caecum content in the slaughterhouse; for young beef cattle (max. 1 year old): rectally collected faeces on livestock farms rearing animals for meat; Antibiotic classes tested: aminopenicillins, phenicols, (fluoro)quinolones, polymyxins, 3rd generation cephalosporins, aminoglycosides, sulphonamides, trimethoprim, tetracyclines, macrolides, carbapenems and glycylcyclines. Analysis of samples: Sciensano

Figure 7 shows the prevalence of **extended-spectrum-beta-lactamase (ESBL)-producing *E. coli*** strains based on selective and non-selective monitoring in veal calves, fattening pigs and broiler chickens. **The positive strains from both selective and non-selective monitoring are suspected of producing extended-spectrum beta-lactamase and therefore of being insensitive to β-lactam antibiotics**. Selective monitoring of +/- 300 faeces samples per animal species detects strains of *E. coli* capable of growing in the presence of cefotaxime (third-generation cephalosporin – a critically important antibiotic). Non-selective monitoring provides the result of the sensitivity testing involving the 3rd generation cephalosporins cefotaxime and ceftazidime of +/- 170 randomly selected *E. coli* strains from faeces samples of the animal species concerned. Selective monitoring will automatically lead to higher prevalence than non-selective monitoring.

Since the start of the monitoring in 2011, the presence of ESBL-producing strains of *E. coli* in fattening pigs, meat calves and young beef cattle **based on the non-selective monitoring has been relatively low** (maximum 10% prevalence). Analogous to the situation in other European countries, a **higher prevalence of ESBLs** is observed **in broiler chickens** compared to other animal species. This can be attributed to several risk factors (e.g. the shorter life span of broiler chickens compared to pigs, veal calves and beef cattle), but is also due to a higher use of antibiotics which target ESBL-producing strains of *E. coli*, specifically aminopenicillins.
The results of selective monitoring also show a higher occurrence of ESBLs in broiler chickens compared to other species, although their occurrence in veal calves increased in 2019 and 2020. **Over the years, a decrease can be observed in the prevalence of these in fattening pigs (-18.0%).**

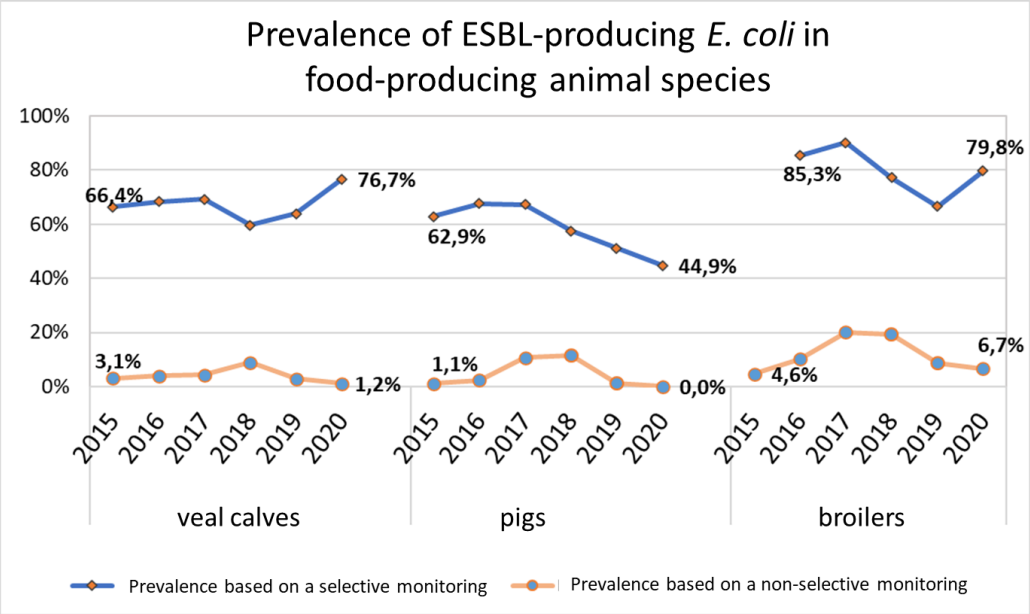

Figure 7. Changes in the prevalence of extended-spectrum beta-lactamase (ESBL)-producing E. coli *in food producing animals in Belgium between 2011 and 2020. Additional information: Number of samples per animal species = +/- 300 for selective monitoring, +/- 170 for non-selective monitoring; Sampling location and type of sample: caecum content in slaughterhouse; Selective monitoring: McConkey plate + cefotaxime; Non-selective monitoring: without cefotaxime. Analysis of samples: Sciensano*

Since the discovery of horizontally transferable resistance mechanisms, the 'polymyxins' class of antibiotics has been upgraded by the World Health Organisation (WHO), resulting in it now being considered as a 'critically important class of antibiotics with the highest priority for public health'. Colistin is the only antibiotic of this class that is used in food-producing animals. **Colistin resistance in *E. coli* from food-producing animals included in the monitoring is historically low (Figure 8). In 2020, as in previous years, very low prevalences of resistance were observed.**

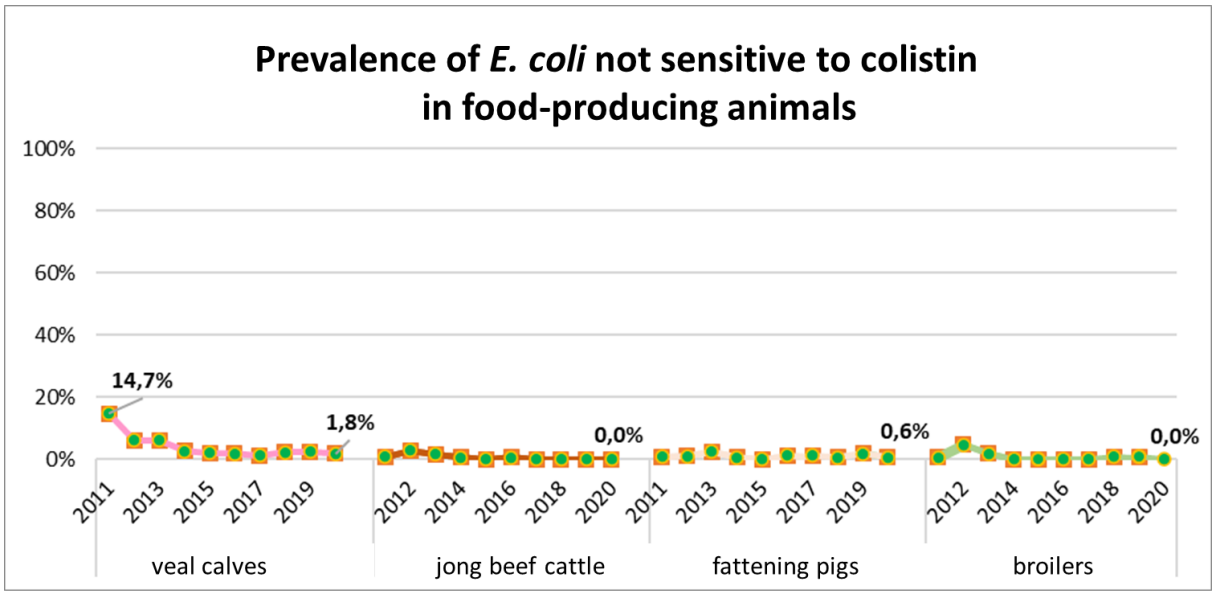

Figure 8. Changes in the prevalence of E. coli *that are insensitive to colistin in food-producing animals in Belgium between 2011 and 2019. Extra info: Number of samples per animal species= +/- 170; Place of sampling: for veal calves, fattening pigs and broiler chickens: caecum content at the slaughterhouse; for young beef cattle (max. 1 year old): rectally collected faeces at the livestock farm. Analysis of samples: Sciensano*

Changes in the prevalence of methicillin-resistant Staphylococcus aureus *(MRSA) between 2011 and 2020*

Figure 9 shows the changes in the occurrence of methicillin-resistant *Staphylococcus aureus* isolated from the nose in veal calves, beef cattle, dairy cattle, pigs and poultry. **MRSA isolates are insensitive to most β-lactam antibiotics and are also often insensitive to several other classes of antibiotics.**

The **prevalence of MRSA in veal calves** lies between 45% and 80%, which is considerably **higher** than in meat and dairy cattle. **Pigs are also often carriers of MRSA**, although a **13.2% decrease** has been observed **since 2013**. In broiler chickens and laying hens, the prevalence has been below 2.5% since 2011.

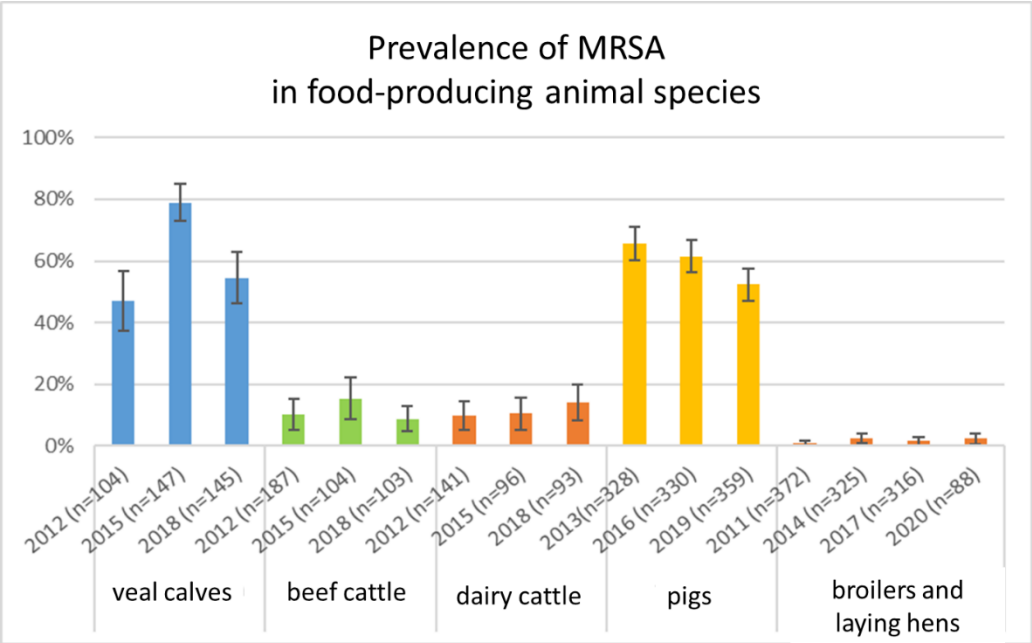

Figure 9. Changes in the prevalence of methicillin-resistant Staphylococcus aureus *(MRSA) in food-producing animals in Belgium between 2011 and 2020. Additional info: Number of samples per animal species and year: see x-axis; one sample= pool of 10-20 nasal swabs; Place of sampling: livestock farm; Analysis of samples: Sciensano.*

Changes with regard to fluoroquinolone resistance in Salmonella enterica *from poultry between 2014 and 2020*

Figure 10 shows the prevalence of the ***Salmonella* serotypes of most importance** to humans that are **insensitive to ciprofloxacin**. Fluoroquinolones are important antibiotics in the treatment of Salmonellosis in humans.

The **prevalence of ciprofloxacin-resistant *S.* Infantis in poultry has been high since 2014**. Moreover, this serotype is gaining importance with regard to its occurrence in poultry. In 2020, a higher prevalence (33.3%) of ciprofloxacin-resistant *S.* Typhimurium-isolates in poultry was observed in comparison to previous years, in which the prevalence of this serotype remained below 30%. However, only three strains are involved, one of which is a resistant strain.

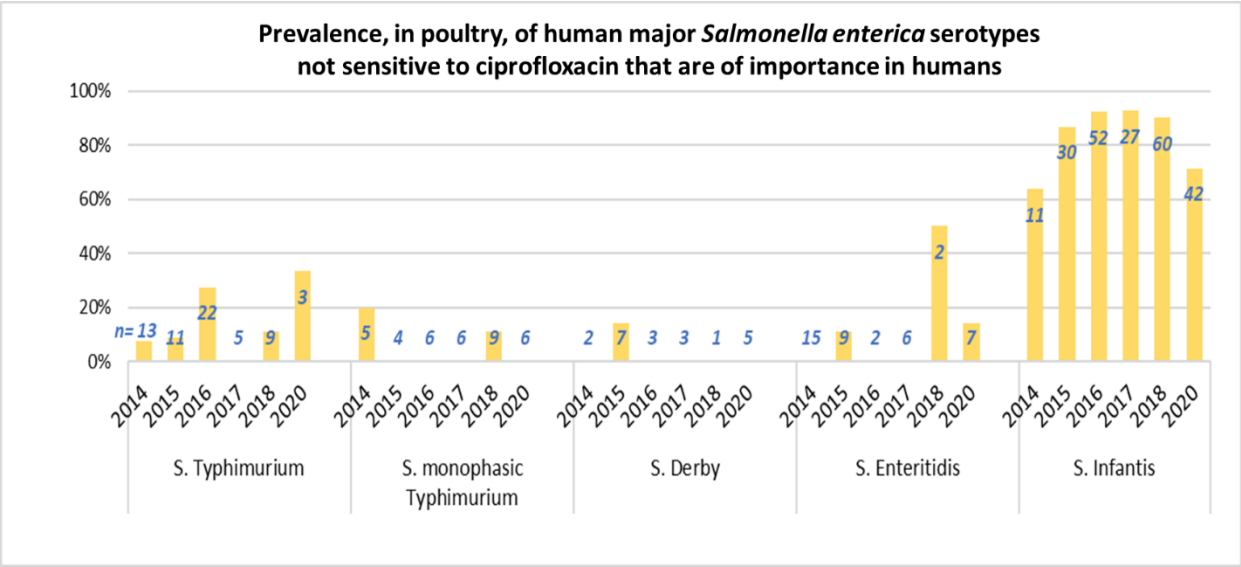

Figure 10. Changes in the prevalence in poultry of Salmonella enterica *serotypes that are insensitive to ciprofloxacin in Belgium between 2014 and 2020. Additional info: Number of samples per year and serotype: see histogram; Place of sampling: on the broiler and laying hen farm; Analysis of samples: Sciensano*

Final conclusions

The last year of Vision 2020 and the Antibiotic Covenant is characterised by a status quo in the changes in sales of antibiotics for use in animals. However, since the start of this first plan, many commitments and initiatives have been taken. Thanks to the outlined policy and the good collaboration between AMCRA, the Government and all the organisations that co-signed the covenant of 30 June 2016, considerable achievements have been made in terms of reducing the use of antibiotics. **By the end of 2020, a 40.2% decrease in the total use of antibiotics compared to 2011 has been achieved.** Overall, the use of **medicated feeds containing antibiotics has been reduced by a total of 70.4%** in recent years. In contrast, the use of **fluoroquinolones,** a **critically important antibiotic,** increased **for the third year in a row**. In 2020, this was mainly due to a 63.6% increase in the use of flumequine. The use of **3rd/4th-generation cephalosporins also increased slightly by 2.3%**. Although **critically important antibiotics** have still **decreased** in use by **70.1% compared to 2011**, the initial target already achieved had to surrender again. The renewed implementation of the relevant articles of the Royal Decree of 21 July 2016 will have to ensure that this negative trend is reversed. By the end of 2020, only one of the three reduction targets has been achieved. **With the signing of the Covenant 2021-2024, the established animal species-specific reduction pathways as part of a new reduction plan, AMCRA's Vision 2024, and the One-Health National Action Plan against Antimicrobial Resistance, there is renewed cooperation in the fight against antimicrobial resistance and continued courage and hope when it comes to following the pathways towards reducing the use of antibiotics.**

A positive finding is that the decrease in the use of colistin observed during the past few years continued in 2020. This shows that following the ban on zinc oxide at the end of 2020, the pig industry is taking preventive measures and implementing alternative treatment methods to the use of antibiotics to control health problems on the farm.

Thanks to the **animal species-specific data collection,** the **use per sector** can be mapped out and individual farms, whose use is high or too high, can be identified. Besides the high usage, a large variation in use can be observed between farms, especially in the case of veal calves and weaned piglets. In the case of veal calves and broiler chickens, a decrease in use was observed in 2020 compared to 2019. Weaned piglets and boars/sows showed the same antibiotic use as a year earlier. Slight increases were reported in suckling piglets and laying hens, though these are animal categories that are characterised by a relatively low baseline usage. Livestock farmers are informed of their usage by means of the **periodic farm reports**. When this use is higher than the median use for their animal sector and category, they are encouraged to elaborate measures for a sustainable reduction of the use of antibiotics on their farm. The veterinarian and the livestock farmer can use the **farm health plan** and the **action plan** for this.

Antibiotic resistance in the indicator bacterium *Escherichia coli* has been **relatively high** since monitoring began in 2011. There is in fact a **trend towards a decrease in the number of multi-resistant and an increase in the number of fully-sensitive strains of *E. coli* in 2020 compared to 2011 for the different food producing species, except for broilers**. **Relatively high prevalences of ESBL-producing strains of *E. coli* were still being** found in 2020 based on selective monitoring in pigs, broilers and veal calves. These prevalences **have been evolving for several years now, in a favourable way in pigs**. Also, the **sensitivity of *E. coli* to colistin**, a critically important antibiotic of highest priority for humans,

remained very high in 2020. **Since monitoring began in 2011, MRSA** has been found most frequently in veal calves and fattening pigs. Meat and dairy cattle and poultry are carriers to a lesser extent.

A **continued reduction in the use** of **all antibiotics** is very important for the purpose of achieving a further reduction in antibiotic resistance in connection with the various indicator and zoonotic bacteria. After all, antibiotic use is the main cause of selection and of the spreading of antibiotic resistance in bacteria. Co-selection plays an important role when it comes to maintaining residence to various classes of antibiotics. **Efforts should be made not only to ensure low usage of critically important antibiotics, but also to reduce the use of all classes of antibiotics.**

In the coming years, the mandatory data collection will be extended to all animal species, including pets. All areas of the livestock sector are aware and are prepared to make sustained efforts to further reduce the use of antibiotics through preventive measures and prudent use, in order to achieve a reduction in resistance over the coming years. This is in the interest of animal and human welfare and health.