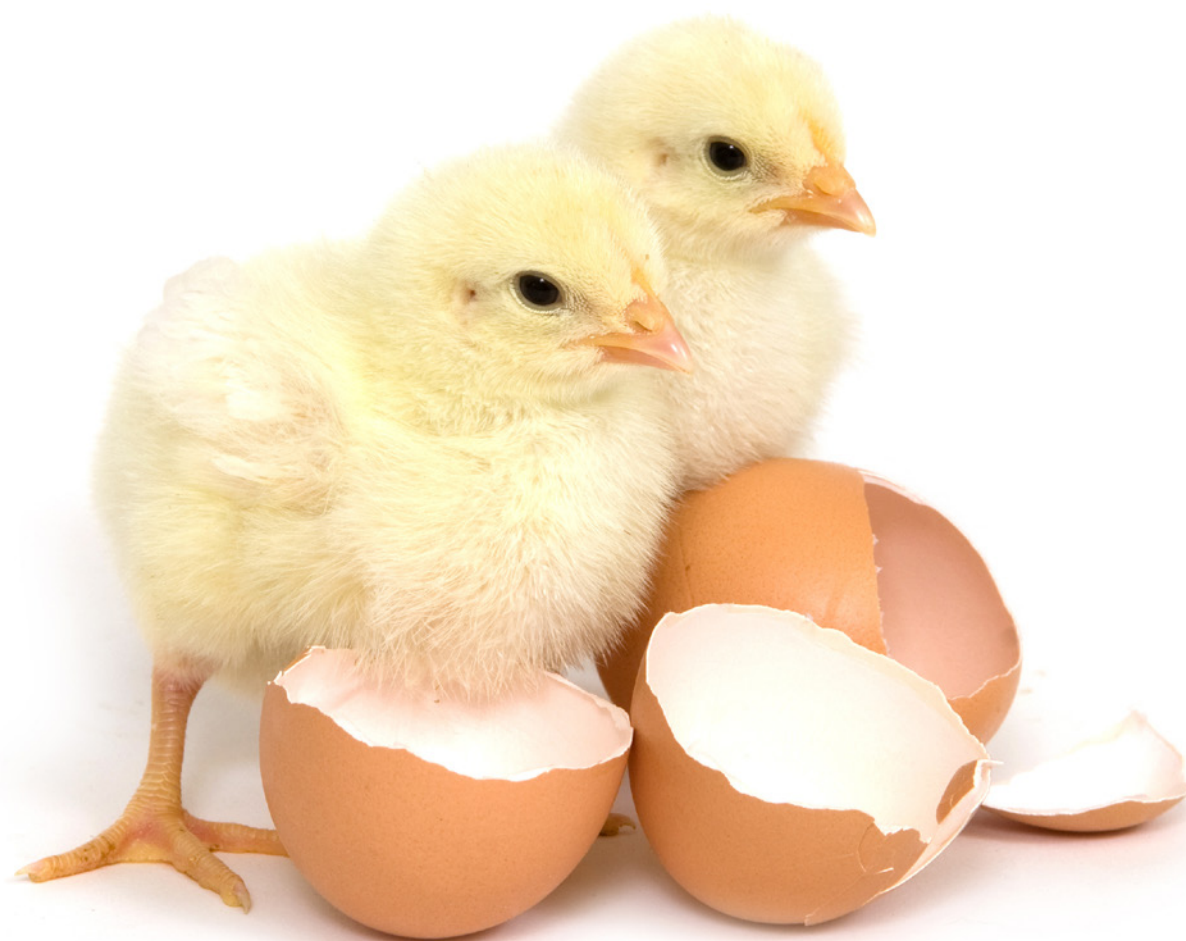


HealthyLivestock

健康畜禽

**Tackling antimicrobial resistance (AMR)**

by increasing the health and welfare of pigs and poultry and  
thereby reducing the need to use antimicrobials.





**HealthyLivestock project** contributes to fighting antimicrobial resistance (AMR), by reducing the need to use antimicrobials in pigs and poultry. Strengthening biosecurity, enhancing animal resilience, early disease detection methods, and more targeted medication will help to decrease antimicrobial use and consequently reduce antimicrobial resistance. HealthyLivestock brings together Chinese and European experts and allows them to work together in a large research project.



**The European Union** of the HealthyLivestock project is funded by the European Union Horizon 2020 research and innovation program under grant agreement number 773436.



**中华人民共和国科学技术部**

Ministry of Science and Technology of the People's Republic of China

**The Chinese part** of the HealthyLivestock project is funded by the Ministry of Science and Technology of the People's Republic of China

# HealthyLivestock project has been concluded!

## The EU and China project coordinators share some wrap up words and thoughts



**Hans Spoolder**

HealthyLivestock European Pillar Coordinator

Our HealthyLivestock project is coming to an end. European and Chinese scientist have worked together over the past 4.5 years to find new ways to reduce the need for antimicrobials in pig and poultry husbandry. And although 4.5 years sounds like a long time, it isn't, really. The quest for scientifically validated and practical solutions to the problem is still as relevant as ever. I just read a press release on internet, referring to a review from WHO\* on the number of new antibiotics currently being developed. The study shows that just 12 new antibiotics have entered the market in the five years from 2017-21. And there are far too few (just 27) under development in clinical trials against pathogens considered critical. To me this means that in our fight against Anti-Microbial Resistance (AMR), the strategy to find new antimicrobials cannot be the only way forward. We need more if we want to keep sufficient medical and veterinary instruments to combat pathogens and maintain and improve human and animal health.

HealthyLivestock set out to explore additional strategies: biosecurity, animal resilience, early detection, and precision medication. We've investigated several innovative ideas, looked into their efficacy, checked them against farmer and societal acceptance and assessed their economic consequences. Not all the proposed solutions are equally successful, and some do not work at all. But we did find [promising ways](#) forward like: Risk assessment tool for broiler and pigs farm biosecurity, Targeted application of alternatives to antibiotics, Early warning system to detect pig s' behavioural changes, Alternatives peri-hatching environment and more...

The project's final consortium meeting on 15-17 January included a 'Science meets industry' day, jointly organised with the ArMoR cluster of EU funded projects. You will find a [report](#) below. It was a success in terms of the range of ideas that were presented and the number of participants. The many speakers managed to inspire the audience of policy workers, industry representatives, advisors, educators and fellow scientists. It is now up to all of us to apply the knowledge that was presented and build on it to further reduce the need for antimicrobials.

When I was asked at the beginning of HealthyLivestock why this project was special to me, I replied that I was looking forward to working with European as well as Chinese experts and support their collaboration in a large research project. My second driver was the link with my own area of research (the study of animal welfare) to solutions for reducing the global problem of antimicrobial resistance. As the project progressed, the idea that improving animal welfare goes hand in hand with the reduction of antimicrobials has become even stronger. And so has the link with our Chinese colleagues (even though we did not manage to meet each other as often as we wanted due to the COVID crisis!).

I would like to thank the teams in Europa and China for all their efforts over the previous 4.5 years, it's been excellent! I also hope that you, our reader, will find sufficient interesting information in this Newsletter and our other outputs to support your work on reducing the need for antimicrobials even further.

Kind regards,

**Hans**



**Shuming Yang**  
HealthyLivestock China Pillar coordinator

The Chinese part of “Tackling antimicrobial resistance (AMR) by increasing the health and welfare of pigs and poultry and thereby reducing the need to use antimicrobials” (HealthyLivestock Project) was launched and implemented, closely related to the national strategies and industrial needs. When the project was launched in 2018, China put in place the National Action Plan for Combating Antibiotics Resistance and the Action for Reducing the Use of Veterinary Antibiotics. In 2019, the production, sales and use of growth promoting feed additives were completely prohibited. At the end of HealthyLivestock Project, we strongly feel the close connection between the scientific research and the industry. The needs of the industry lead the research activities of the project, and the research results can also be quickly applied to the industry. The collaboration between the industry and the research has brought fruitful results.

By the end of 2022, the Chinese part of the project has developed ten new technologies, sixteen new products, six standards and technical regulations and published forty-one research essays. Through the demonstration of large-scale pig and poultry farms, the antibiotics usage, drug residue and antibiotics resistance has been significantly reduced.

The prohibition of growth promoting antibiotics in the European Union was nearly 20 years earlier than that in China. The relevant research in animal welfare, veterinary antibiotics reduction started early, involving many institutions, and the results were widely applied. Through four years of international cooperation, although we have been continuously affected by the COVID-19 epidemic, we have deeply felt the enthusiasm and effective cooperation of European partners. I would like to thank all European partners, led by Wageningen Livestock Research, for their contributions to the smooth implementation of the Chinese part of the project and the remarkable results achieved.

The harm of antimicrobial resistance (AMR) to human health and sustainable development of animal husbandry has received global attention. According to a research report published by the Lancet in January 2021, 1.27 million deaths worldwide were directly related to antimicrobial resistance in 2019, which is significantly higher than the previous estimate of 700,000 AMR related deaths per year, and AMR is described as a “silent pandemic”. Due to the horizontal transmission of AMR among bacteria, it is difficult to effectively curb AMR in a single region or industry. Due to its complexity, it is necessary to reach international consensus more broadly, and join the efforts of more scientists and industries.

The project has achieved fruitful results in the areas of healthy pig and poultry farming systems, animal welfare, biosecurity control in large-scale farms, animal disease control, and reduced use and substitution of antibiotics. However, these achievements still fall short of the expectations of the livestock farming industry for simple, rapid, and efficient control of AMR, and more efforts and technological innovations by more research teams are needed.

The four years of HealthyLivestock Project have shown that we are a domestic research team capable of good cooperation, as well as an EU-China research team capable of good cooperation. I hope that we can cooperate again in the future and hope that each team has a better future.





## HealthyLivestock Final Consortium Meeting in Wageningen

### HealthyLivestock final meeting

From the 15<sup>th</sup> to the 17<sup>th</sup> of February 2023, the project consortium met for its final annual meeting, in Wageningen, The Netherlands. Unfortunately, due to travel restrictions in China, our Chinese colleagues couldn't join us in person therefore they joined the meeting online.

The meeting brought all participants of the project together with a representation from the projects Scientific Advisory Board, to present and discuss each of the Work Packages' research progress and results achieved since the consortium meeting last year and focused on the outcomes of the last 3 WPs which were concluded in the last part of the project.

Read more about HealthyLivestock Project outcomes [HERE](#).



February 2023, Wageningen

## ArMoR event in Wageningen

### “Science meets Industry: Reducing antimicrobial use in Livestock”

Under EC initiative called [Horizon results booster](#), a group of related sister projects, all in the field of fighting antimicrobial usage and antimicrobial resistance in livestock farming and with similar target audiences - were brought together in one cluster, named: “ArMoR –fighting Antimicrobial Resistance in livestock farming”. ArMOR partners are: [HealthyLivestock](#), [AVANT](#), [DISARM](#), [Roadmap](#), [AMRILS](#), [BM-FARM](#) and [FARM-CARE](#).



On the 16th of February 2023 the **final event** of Healthy Livestock project was held, together with the [ArMOR cluster](#).

This event took place at WICC Hotel in Wageningen, and it brought science and industry together to fight AMR. Leading scientists, practitioners and industry had the opportunity to meet, discuss and get to know the innovations for fighting AMR in livestock farming.

The event was hybrid and hosted almost 60 people in person, 100 online from EU and 9690 from China. In China, the event was broadcasted in 6 different platforms and to facilitate the communication with the Chinese audience the Chinese HealthyLivestock partners provided all presentations with subtitles and simultaneous translation online.

The introduction session started with speeches from the HealthyLivestock coordinators, Hans Spoolder and Shuming Yang who presented the project and the ArMOR cluster. Jean Charles Cavitte, research policy officer at the EC (DG AGRI), presenting the EU Commission actions on AMR and AMU and Nelea Motriuc, from FAO, presenting the AMR Multi-Stakeholder [Partnership Platform](#).

During the Second part, ArMoR projects, invited project and industries had the opportunity to present their research, outcomes, innovations, and products dealing with a wide range of solutions for antimicrobial use and antimicrobial resistance. Pitches of current Horizon2020 projects in the ArMoR cluster, other projects, and industries on reducing AMU and AMR were presented and covered a wide range of solutions and potential solutions to improve the health and welfare of animals. Topics as early detection of diseases, electronic applications, ways to communicate results, ways to create synergies, and others were discussed. There was a small 'competition' and From the 14 pitches that were presented PigChamp was voted as the best presented pitch and BM farm offered the most promising solution to fight AMR, according to the audience.

The Third part of the day took place right after a networking lunch, were posters and stands of the different projects and stakeholders were presented. For the online participants, the posters were displayed via zoom and online streaming.

The session started with an interactive round table with a diverse group of 7 panel members: Jean Charles Cavitte (EU Commission), Rens van Dobbenburgh (FVE), Yu Qiu (UN FAO), Cat McLaughlin (EPRUMA), Adam Drosio (Copa Cogeca), Clare Carlisle (Animal Health Europe) and Joost van den Borne (Schippers Group).

FVE spoke about how they implemented One Health as one of its strategic priority topics in the last 15 years. The EU Commission focused on their beliefs of what should be in the focus of future projects. UN FAO focused on differences in AMU in livestock at a European and Global level and how to ensure that research results arrive at the places where they are most needed. EPRUMA commented on their objective to bring together different stakeholders, such as farmers, vets, and manufacturers of animal medicines and diagnostics and what roles retailers and consumers have to play on the platform, considering they are not members. Copa Cogeca advised researchers on how to make it easier for farmers to use the results. Animal Health Europe commented on the compatibility between sustainability and efficiency. Finally, the Schippers Group states on their website "We believe in a world where livestock farming drastically reduces the use of antibiotics to combat Antimicrobial Resistance (AMR). We believe in a world without AMR", they explained their reasons for being so optimistic.

The event ended with a plenary discussion around some "burning statements":

"Reduction of antimicrobial use in livestock to the appropriate level is not dependent on research" and "Farm animal welfare will only be improved when no extra costs are involved".

**Please find here links to the event recording, digital posters, presentations, photo gallery and the event proceedings.**

- [The event recordings](#)
- [Event photos gallery](#)
- [Presentations links](#)
- [Event proceedings](#)
- [Electronic poster links](#)





## HealthyLivestock Outcomes:

### Technical notes

HealthyLivestock project created Technical Notes which aim at farmers and veterinarians. The Technical notes are a translation of the results and outcomes of the different areas of the project research, to an accessible format for the farming community, with an emphasis on how they can be used to improve the health & welfare status of the animals on the farm.

The technical notes are “easy to read”, clearly illustrated and include the description of best practices identified by the project and its findings.

Please visit [our website](#) for the technical notes.





## Policy brief

Antimicrobials losing effectiveness because of bacteria becoming increasingly resistant to them is a growing problem. The World Health Organization has declared antimicrobial resistance (AMR) as one of the top 10 global health threats facing humanity. Lack of safe and effective antimicrobials puts the ability of modern medicine to treat bacterial infections at risk. The cost of AMR to the economy is also significant. AMR is an issue for animals too. Moreover, resistant bacteria can be transmitted from animals to people and vice versa.



The HealthyLivestock research project's central hypothesis is that strengthening the health and welfare of livestock will contribute to protecting animals against infectious diseases. Systematically implementing risk-based biosecurity measures, and creating husbandry systems that allow animals to thrive, will make animals less vulnerable to infectious diseases. This will reduce the need for antimicrobials and so cut the risk of resistant bacteria emerging and spreading. In animals that still need treatment, detecting issues early and providing targeted and effective treatment will also help mitigate the risk of AMR.

We can improve animals' health and welfare in several ways. Through the HealthyLivestock research described below, carried out in the European Union and in China, we demonstrate that improved biosecurity, strengthened resilience, early disease detection and targeted medication can reduce the need for antimicrobials in animal husbandry, in particular for pigs and poultry.

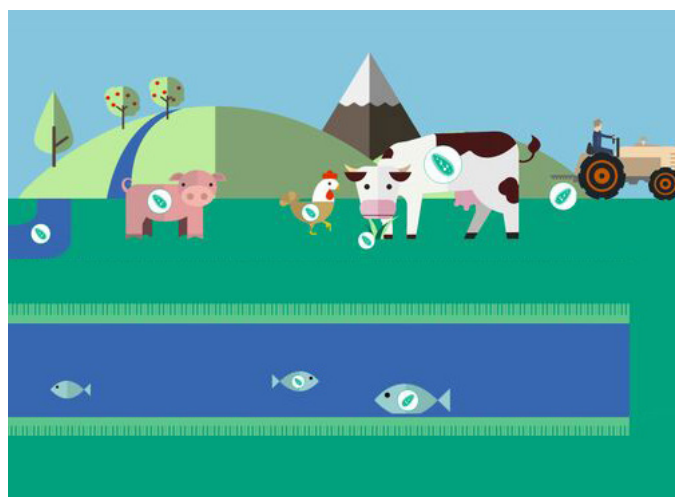
Below are our recommendations for politicians and other decision-makers with an interest in animal production and fighting antimicrobial resistance in pigs and poultry.

Politicians can use these to develop and implement new policies and regulations, at international, national and local level. We hope other decision-makers, including veterinarians and farmers and their organisations, production chains, institutions for quality assurance, wholesalers, retailers, non-governmental organisations and academics, will use our recommendations in their work, for example to help set standards and develop codes of practice.

Read the short version [HERE](#). Read the full version [HERE](#).

## Tackling Antimicrobial Resistance: a global, joint effort!

Antimicrobials are the cornerstone of modern medicine, significantly improving human and animal health. However, the overuse and misuse of antimicrobial in recent years means they're becoming less effective and accelerate antimicrobial resistance. According to "Global Research on Antimicrobial Resistance", AMR has now become a leading cause of death globally, associated with nearly 5 million deaths worldwide in 2019. If unchecked, AMR could cause 3.4 trillion loss of GDP annually and push 24 million more people into extreme poverty in the next decade.



AMR is one of the top ten global public health threats. Currently, more than 70 percent of antimicrobials sold worldwide are used in animals for human consumption. This situation is expected to worsen as global demand for food increases. It is therefore paramount that the agrifood systems are progressively transformed to reduce the need for antimicrobials. International organisations have taken various measures to reduce the use of antimicrobial in agricultural production. FAO is working on the Reduce the Need for Antimicrobials on Farms (RENOFARM) initiative. This is a 10-year global initiative to provide comprehensive support to Members in reducing the need for antimicrobials in their agrifood production.

It's aimed to achieve 30-50% reduction in the total amount of antimicrobials used in the food and agriculture sectors from the current level. FAO is also developing the International Antimicrobial Resistance Monitoring (In FARM) platform to gather AMR surveillance information across the food chain. Besides, in November 2022, the Food and Agriculture Organization of the United Nations (FAO), the UN Environment Programme (UNEP), the World Health Organization (WHO) and the World Organisation for Animal Health (WOAH), known as the Quadripartite, launched the Antimicrobial Resistance Multi-Stakeholder Partnership Platform to ensure the growing threats and impacts of antimicrobial resistance are addressed globally by fostering cooperation between a diverse range of stakeholders at all levels across the One Health spectrum.

The EU is a leader in the global fight against AMR. The EU has officially adopted new legislation on Veterinary Medicinal Products (Regulation (EU) 2019/6) and Medicated Feed (Regulation (EU) 2019/4), applicable from 28 January 2022. The rules are more transparent and easier to implement,

Helping the profession in safeguarding animal health, animal welfare and public health, including combating antimicrobial resistance, including that a central EU database of all authorised veterinary medicines will be set up; on- farm monitoring systems of antibiotic use and national surveillance of antibiotic use become mandatory; imported animals and animal products from outside the EU need to conform to the ban on growth-promoting antimicrobials and the ban on antibiotics reserved for human use, etc. In May 2020, the EU adopted the Farm to Fork strategy, targeting on 50% reduction of AM sales for farmed animals and in aquaculture by 2030 (compared to 2018 figures).

In China, the use of antimicrobials in farm animals has been on a continuous decline since 2017. According to the Ministry of Agriculture and Rural Affairs, animals on farms nationwide consumed 32,500 metric tons of antimicrobials in 2021, down from 41,800 tons in 2017. In 2021, the Ministry of Agriculture and Rural Affairs put in place the National Action Plan for Reducing the Use of Veterinary Antimicrobials during the 14th Five-Year Plan (2021-25) period.



The effort mainly targets pigs, chickens, ducks, cattle, and sheep raised for meat, as well as eggs and milk. The plan's aim is to keep the antimicrobials used for each ton of animal products on a downward spiral between 2021 and 2025 and ensure that more than 98 percent of animal product samples are up to standard. By 2025, half of China's large animal farms will participate in campaigns to curb antibiotic use, and certain drugs will strictly require prescriptions before being applied to animals. In 2022, the Ministry promoted the reduction of antimicrobial consumption at 21000 farms nationally. The campaign, covering 16 species including pigs and chickens, has seen "notable progress".

## Animal Welfare and Antimicrobial Reduction Session of 4th World Conference on Farm Animal Welfare

On November 27th, 2022, the Animal Welfare and Antimicrobial Reduction Session of 4th World Conference on Farm Animal Welfare was held. It's composed of two sessions: China & Netherlands Symposium in the morning and HealthyLivestock Project Meeting in the afternoon, jointly hosted by Embassy of the Kingdom of the Netherlands in China, Netherlands Agro & Food Technology Centre (NAFTC), International Cooperation Committee of Animal Welfare (ICCAW) and HealthyLivestock Project. Many experts from China and Europe shared on innovative methods of reducing antimicrobial usage and improving animal welfare in livestock farming.



At the China & Netherlands Symposium, Jun Bao, ICCAW President and Ina Enting, Director of NAFTC delivered welcome speeches. Karel van Bommel, Agricultural Counsellor of the Royal Dutch Embassy in China, shared on the exploration and progress of the Netherlands in animal welfare and antimicrobial reduction. Professor Deng Jinping of South China Agricultural University introduced about a new feeding management model and the experimental data in improving the health and welfare of piglets. Li Dongli, Director of Broiler R & D Center of Smart (Beijing) Food Co., Ltd., shared about the Ten Welfare Measures of the company in vertical broiler farming. Zheng Zhenhua, China Technical Manager of Nuscience, introduced about the pig health, welfare and biosecurity measures of Nuscience Jing'an Pilot Farm.

At the HealthyLivestock Project Meeting, Prof. Shuming Yang of Chinese Academy of Agricultural Sciences, delivered a welcome speech.



He said that the meeting offered a good opportunity to share about the research outcomes with the livestock industry, which helped promote the practical adoption of the new technologies. Then the experts shared on the research outcomes around the four strategies: biosecurity, improving animal resilience, rapid detection of diseases and targeted use and alternative medication. Ten projects representatives and research experts from China and Europe, including Dr. Paolo Ferrari, Senior Researcher of Research Center for Animal Production, Prof. Jianxi Li, Vice Director of Lanzhou Institute of Husbandry and Pharmaceutical Sciences and Dr. David Speksnijder, Researcher of the University of Utrecht, shared on the research outcomes and innovative solutions.





# Tackling antimicrobial resistance (AMR)

by increasing the health and welfare of pigs and poultry  
and thereby reducing the need to use antimicrobials.

## Food Chain Partners



## Academic Partners



**You are all welcome to share this newsletter widely!**

For further information please follow us and **contact us** on:

Web: [HealthyLivestock.net](http://HealthyLivestock.net)

Twitter: [@HLSProject](https://twitter.com/HLSProject)

LinkedIn: [#HealthyLivestock](https://www.linkedin.com/company/HealthyLivestock)

Facebook: [HealthyLivestock Project](https://www.facebook.com/HealthyLivestockProject)