AGES

# RESEARCH, EXPERIMENTAL DEVELOPMENT & KNOWLEDGE TRANSFER ACTIVITIES

Report 2024

## Dear reader,

AGES topics such as climate change, food and nutrition, and antibiotic resistance remain very important. These challenges are often closely intertwined with each other and have overlapping effects on humans, animals, plants and the environment. A holistic view – a One Health approach – can assist in understanding the complex relationships between human, animal and plant health, as well as climate change, and give us the opportunity to find a targeted response.

**Dr. Anton Reinl**
Managing Director

AGES has been following this holistic approach since its founding more than 20 years ago. Our experts work in an interdisciplinary manner to systematically identify, evaluate and interpret risks. This enables the development of appropriate measures. AGES participates in research and development projects as a non-university research institution and cooperates with numerous Austrian and international authorities, private companies and other research institutions.

**Priv.-Doz. Dr. Johannes Pleiner-Duxneuner**
Managing Director

One of our central aims is to ensure the findings made are accessible to a broader public. This research report provides an overview of our research activities. A range of projects are presented as examples of our work, focused on the topics of: good laboratory practice, weed management in vineyards and fruit growing, radioactivity monitoring, vancomycin-resistant enterococci, measures to reduce tobacco products, and phytogenic substances in animal feeds. In addition, we detail our Europe-wide collaborations.

We hope to give you an interesting insight into our research activities and wish you a pleasant and informative read!

Further information about our research activities is available on our homepage (www. ages.at) and via the AGES research portal (QR code).

# About Us

We are constantly involved in dealing with and containing potential risks to humans, animals and plants and ensuring better consumer safety in Austria, as part of our One Health philosophy, whether because of pathogens present in humans, animals and plants, counterfeit drugs, resistance to antibiotics, residues in foods, soil and seed examinations or radiation and climate protection. This means we analyse, monitor, evaluate, research and communicate 365 days a year.

# Our Locations

We can be found throughout Austria: our headquarters and three additional locations are in Vienna. We also have sites in Graz, Innsbruck, Linz, Mödling, and Salzburg. Additionally, we operate test stations in Carinthia, Styria, Lower Austria, and Upper Austria.

**We inform**
consumers and companies

**We consult**
politicians and authorities

**We work**
regionally, nationally and internationally

# Our Fields of Activity

AGES is owned by the Republic of Austria and works on behalf of the Federal Ministry of Labour, Social Affairs, Health, Care and Consumer Protection (BMASGPK) and the Federal Ministry of Agriculture and Forestry, Climate and Environmental Protection, Regions and Water Management (BMLUK). We cover many topics relevant to the environment and to health in our six fields of activity:

**Food Security**

Bee health, plant protection, seeds, soil health ...

**Food Safety**

Mycotoxins, heavy metals, and other contaminants, farm to fork ...

**Medical Market Surveillance**

Drug licencing, clinical trials, reports of side effects ...

**Public Health**

Influenza, gonococci, tuberculosis, Ebola, cholera, polio ....

**Radiation Protection**

Radon, drinking water, disposal ...

**Animal Health**

Animal diseases, zoonoses, parasites ...

These six fields of activity are supported by our units and our three specialist departments:

**Integrative Risk Assessment, Data & Statistics**

**Risk Communications**

**Knowledge Transfer & Research**

# Our Research

We act professionally and independently using scientific expertise in line with the tasks stated in Art. 8 of the Austrian Health and Food Safety Act. Our official mandate and the extensive task spectrum in our mandate require us to carry out applied research and impart relevant scientific knowledge to the public via our knowledge transfer activities.

## Applied Research

AGES employs highly qualified experts and employees, who carry out a vast range of examination and test activities on behalf of the Austrian public and represent the country in national and EU committees, all with the utmost diligence and in line with the legal framework. AGES experts are active in almost 800 national and international committees.

"The research activities of our experts allow us to assess risks better, react appropriately in crises, and react to new professional challenges in a timely way. This work secures our position as an independent, objective expert agency in Austria."

- DI Mag. DDr. Alois Leidwein, Head of Knowledge Transfer, Applied Research and AGES Academy

We share information with specialists and interact with authorities/regional authorities/agencies also in the form of capacity building projects (at national, EU and international levels). Knowledge transfer projects promote the sharing of information and support the EU-wide networking activities of AGES experts beyond our committee work. Our consulting activities for authorities and government institutions have been expanding at national and international levels. Young scientists and experts are recruited via projects and given opportunities to develop their careers. Knowledge is shared by our experts with the public via publications and presentations. We are also involved in a wide range of transnational projects.

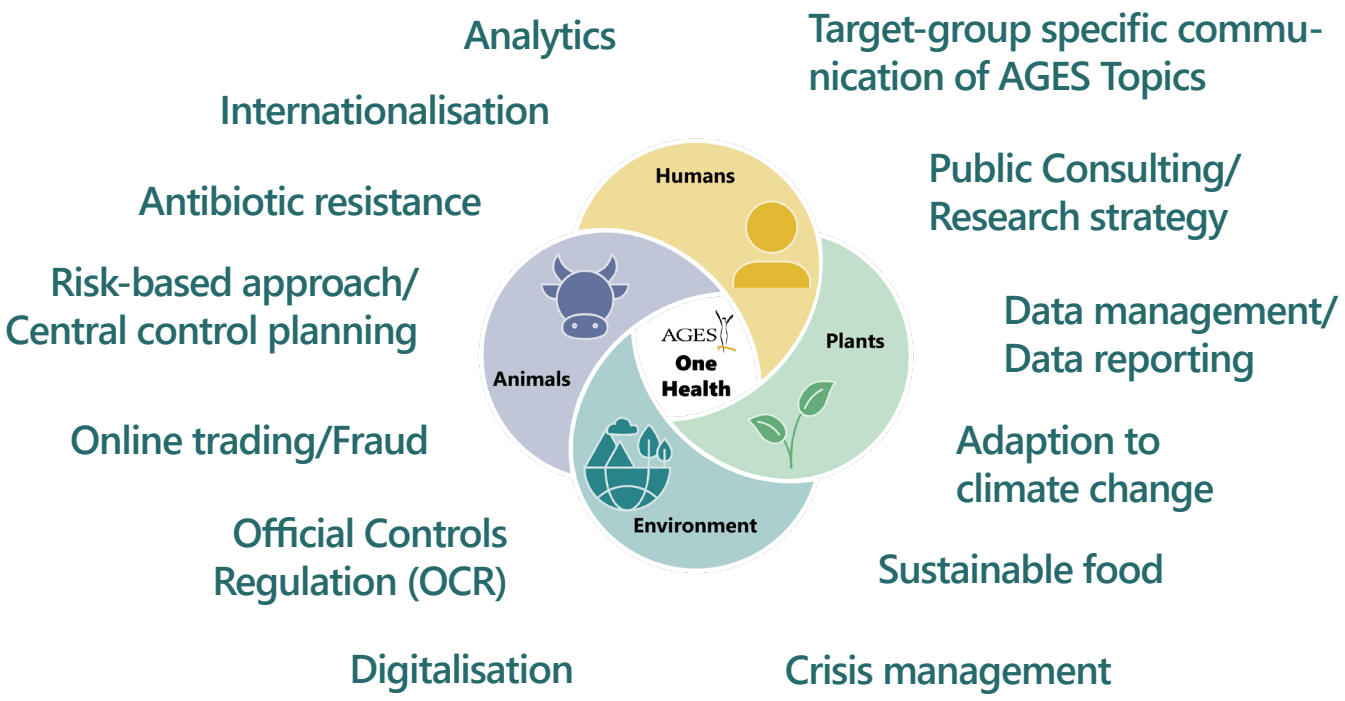
# Our Research Cooperations

We carry out research projects together with external partner organisations in all our fields of activity – from food, drug and medical product safety to animal health, public health, food security and radiation protection.

Our work in research networks helps us in fields ranging from professional networking, knowledge transfer, and the establishment of strategic partnerships for joint project submissions, and project execution to cooperation in crisis situations, among other areas. We have research partnerships with universities and other research institutions at both national and international levels.

The success of our scientific work and research projects is based on cooperation agreements and partnerships with, for example, the Federal Ministry of Labour, Social Affairs, Health, Care and Consumer Protection (BMASGPK); the Federal Ministry of Agriculture and Forestry, Climate and Environmental Protection, Regions and Water Management (BMLUK); the University of Natural Resources and Life Sciences (BOKU) or the University of Veterinary Medicine Vienna (Vetmeduni) at a national level. Additionally, we co-publish the journal: Die Bodenkultur – Journal for Land Management, Food and Environment. We also have cooperation agreements at international levels, such as with the German Federal Institute for Risk Assessment (BfR) and the German Agency for International Cooperation GmbH (GIZ).

## The Core Topics in Our Business Concept 2021-2025



# Our Projects

Sustainability-oriented research at AGES strives to contribute to sustainable development and the 17 SDGs (Sustainable Development Goals of the United Nations). It is designed to create understanding, analyse connections, identify problem areas, and create solutions for today's challenges. Furthermore, our research encourages innovation and brings new impulses into society by developing new methods and tools for broader use.

All 193 member states of the United Nations have set themselves 17 goals for sustainable development to improve economic, social, and ecological conditions worldwide. The experts at AGES work actively towards achieving all these goals, bar the first ("no poverty").


Research and science can make vital contributions during the transformation to sustainable development by generating new knowledge and making it useful at a social level, as well as helping to create and use innovative methods to combine theory and practice and encourage broader participation.

Thus, we would like to present some of our current projects to give you a representative view of our research activities. We contribute to achieving key goals for sustainable development through our projects.

# Project: ABOW-AT



**Alternative weed control in fruit and grape growing based on autonomous technologies**

Weed control in the cultivation of fruit and wine grapes is dominated by mechanical and chemical methods. Herbicides (weed killers) are relatively cheap and very effective. However, their environmental impact and possibly harmful residues are frequently under discussion. Mechanical cultivation methods may also have detrimental effects on erosion protection, carbon storage and soil fertility. This joint project by research facilities from Bavaria (Germany), South Tyrol (Italy) and Austria investigated alternative weed management.

The researchers developed an autonomous carrier vehicle as part of the project ABOW-AT with a mowing function that could be used around the lower trunk areas of vines and trees. Additionally, they also compiled a literature-based list of natural substances known for their herbicidal properties and their ecological suitability for use in local orchards and vineyards. The effectiveness of the selected, natural substances with herbicidal effects and a sprayable mulch layer based on renewable raw materials were tested in practical trials at various locations in Lower Austria in 2022 and 2023.

The use of the alternative mulching method in fruit growing yielded good results in suppressing weed growth across the entire trial period. However, the levels of coverage and growth height of the weeds were both higher compared to mechanical weed control methods used four times during the same period. Cracks in the mulch layer could not prevent the growth of weeds that reproduce by seeds. Moreover, some problematic weeds (e.g. field bindweed and couch grass) could grow through the mulch. The use of the natural herbicidal substances had no lasting impact on weed suppression, leading only to a short-term removal of the overground biomass.

"The ecological effects of the individual methods were tested in vineyards. These methods showed no significant impact on the density of predatory mites or the colonization rate of arbuscular mycorrhizal fungi. An increase in the number of earwigs was the only detectable effect that was determined when using the mulching alternative."

- Dr. Swen Follak, Sustainable Plant Production

The autonomous Dyonisios mowing robot, developed as part of this project, is an advanced prototype and work on its full development will be continued in a start-up. The economic assessment of the sprayable mulch film and Dyonisios resulted in rather high costs for the mulch alternative when compared directly to the other methods.

**Head of Project AGES:** Dr. Swen Follak
**Project coordination:** HBLFA Francisco Josephinum

# Project: BeStroPluLu

The survey of the current, normal activity concentration of radionuclides in the air is of great significance for continuous environmental monitoring. The data gathered helps estimate dose levels in the population and explain seasonal fluctuations. Austria is legally obliged to monitor all environmental media (e.g. soil, vegetation, air) for radiation levels in line with Article 35 of the Euratom Treaty. Austria's environmental radiological monitoring is regulated in the Austrian Radiation Protection Act from 2020 (Strahlenschutzgesetz 2020) and AGES has been assigned the task to carry out the monitoring by the competent federal ministry.

The monitoring of environmental media for radioactivity is already very well established. In terms of air monitoring, airborne radionuclides are collected on air filters using aerosol collectors and identified and quantified using gamma spectroscopy. This assessment does not register other relevant radionuclides, such as strontium-90 or plutonium-239. These radionuclides may be released during a radiological emergency (such as a nuclear power plant accident or the detonation of a nuclear weapon) and would contribute significantly to the population's dose levels. Interest in monitoring activity concentration of these radionuclides in the air has increased because of the ongoing conflict in Ukraine and a potential use of nuclear weapons. The data collected is extremely valuable when it comes to estimating the dose levels of the population, even in routine situations.

"The readings and findings of this project make up another piece of the puzzle in the overall picture of Austria's radiation monitoring. The information is of relevance to both people and the environment, particularly regarding emergency management."

- Rainer Kadan MSc, Radiation Protection and Radiochemistry

Consequently, this task was dealt with and achieved as part of the BeStroPluLu project. The initial challenge was to develop and establish a suitable method for this problem. The measurement results were evaluated following the successful analysis of the samples. This was done by analysing the air filters of an entire year. The data gathered showed that the contribution of airborne strontium-90 and plutonium-239 radiations doses are neglectable for the population under normal circumstances. Additionally, the activity concentration levels of these nuclides had seasonal fluctuations (maximum values in spring and autumn). This corresponds with the typical ploughing periods of agricultural land. Subsequently, it can be concluded from this observation that the highest activity concentration of the radionuclides evaluated can be traced back to ground disturbance of existing soil radioactivity. As a concluding highlight, all results and findings were presented and discussed in front of an expert audience at the 10th International Conference on Nuclear and Radiochemistry – NRC10.

**Head of Project AGES:** Rainer Kadan MSc
**Project coordination:** AGES

# Project: D-A-CH Studie


**Molecular Epidemiology VRE E. faecium**

Vancomyin-resistant enterococci (VRE) are resistant to the reserve, last-resort antibiotic vancomycin. VRE was added to the list of highly dangerous pathogens by the World Health Organization (WHO) because of difficulties in treating VRE infections.

Invasive infections caused by VRE have increased across Europe over recent years and, thus, present one of the more serious threats within the health sector. The incidence and spread of VRE strains in several European countries have shown varying dynamics. VRE numbers are remarkably different, even in neighbouring countries with similar conditions (EARS-Net 2019: Germany: 26.3 %, Austria: 4 %, Switzerland 2 %). This study intended to answer the following questions: what are the factors causing these differences? Why does VRE spread so efficiently in some countries, while the number of cases remain low in others?

"Enterococci are bacteria that are a normal part of the intestine of humans, many mammals and birds. However, they may also cause a variety of severe infections."

- Mag. Dr. Werner Ruppitsch, Medical Microbiology and Hygiene

The study was based on the molecular-epidemiological analysis of > 2,500 VRE isolators from Austria, Germany and Switzerland. The analysis of genome data (WGS – Whole Genome Sequencing) and hospital meta-data allowed for a highly detailed spatial and temporal description of transmissions. A network of competence centres with profound expert knowledge in VRE sequencing and epidemiology was set up. Publications on this subject to date (and in progress):

- Cabal Rosel A, Hörtenhuber A, Halabi M, Kerschner H, Salaheddin Y, Ruppitsch W. (2024) First detection of the emerging vancomycin-resistant Enterococccus faecium ST1299-CT1903 in Austria. Clin Microbiol Infect. 18: S1198-743X(24)00396-3.

- Rath A, Kieninger B, Mirzaliyeva N, Werner G, Bender JK, Fischer MA, Cabal-Rosel A, Ruppitsch W, Seth-Smith H, Egli A, Halabi M, Hörtenhuber A, Prammer W, Salaheddin Y, Kerschner H, Hartl R, Ehrenschwender M, Ambrosch A, Kalinowski J, Klages LJ, Rückert-Reed C, Busche T, Kratzer A, Caplunik-Pratsch A, Eichner A, Fritsch J, Schneider-Brachert W. (2024) ST1299/vanA is the new kid on the block - Tracing the successful spread of a novel vancomycin-resistant Enterococcus faecium strain from the local to the cross-border level. Euro Surveill. Accepted

**Head of Project AGES:** Mag. Dr. Werner Ruppitsch
**Project coordination:** European Society of Clinical Microbiology and Infectious Diseases

# Project: JATC II

**Joint Action Tobacco Control**

Smoking and other forms of tobacco consumption are considered the most significant cause of avoidable diseases worldwide, with tobacco being the main cause of premature fatalities in the European Union. Tobacco was consumed by 22.3 % of the world's population in 2020, 36.7% of all males and 7.8% of all females globally. Europe has the highest level of tobacco-related diseases across the WHO regions, particularly in young people and adolescents, despite making some progress in reducing the number smokers over the past decade. This leads to around 700,000 deaths in the EU every year.

The Joint Action on Tobacco Control 2 is an EU-wide project intending to enhance tobacco control and promote public health. It is built on the results of the first JATC project and introduces new areas of work designed to address the challenges faced in tobacco prevention even more comprehensively.

The main goal is to assist EU Member States in putting the directives for tobacco products and advertising (TPD and TAD) into effect and promoting the WHO Framework Convention on Tobacco Control (FCTC), focusing in particular on harmonising regulations and controlling tobacco products, as well as on the development of sustainable strategies for smoke-free environments and long-term tobacco control measures.

The most important project results are the strengthening of cooperation and knowledge-transfer between EU Member States, the development and dissemination of best practices in tobacco control and advertising restrictions, and the assisting of Member States in data usage and monitoring via the EU-Common Entry Gate (EU-CEG). Recommendations based on this research include the revision and strengthening of tobacco control laws (TPD and TAD) and recommendations for smoke-free environments. The alarming increase in tobacco and nicotine consumption among younger people requires targeted preventative measures. The continued cooperation between Member States and the EU Commission remains a crucial factor in efforts to contain tobacco and nicotine addiction.

A total of 21 countries, 38 institutions and 15 partners have achieved important progress in the future of tobacco control, stronger demands for measures and closer cooperation. This should help reduce tobacco and nicotine consumption in Europe in the long-term and protect public health.

**AGES-Project work:** Head of Project Work Package 3 (WP3) Evaluation: Irina Gebetsberger-Hartleitner BSc; WP3 Evaluation: Ulrike Aldrian MA; WP7 E-cigarettes and novel Tobacco products: Mag. Dr. Katharina Vejdovszky MScTox, Dr. Gregor Walch; WP5 EU-Common Entry Gate: Fiona Pastler, Ing. Manfred Haslinger; Finances and coordination: Ing. Mag. Christine Berger, Mag. Dr. Christine Weber

**Project coordination:** Danish Safety Technology Authority

# Project: MAPOQS



**Improved understanding of mechanisms in phytogenic substances on QS-related parameters of pathogens relevant in animal production**

The search for alternatives to antimicrobial growth stimulants to prevent bacterial infection in livestock farming is never-ending. One potential alternative are so-called phytogenics, plant-based, bioactive compounds, which can inhibit the growth of pathogenic bacteria. The stimulant doses usually required are often very high and therefore not suitable as feed additives because of their intensive flavour and high costs. Phytogenic substances, on the other hand, affect bacterial communication (quorum sensing) in small concentrations, in addition to their antimicrobial properties. Virulence factors that can infect their host successfully through bacteria are among the processes regulated by quorum sensing.

"Identifying phytogenic compounds with promising effects on communication in pathogenic bacteria can help us formulate effective feed additives. These feed additives are intended to improve the resilience of animal species to relevant bacterial pathogens."

- Anika Weitmann MSc, Animal Nutrition and Feed

The predecessor GEVEC project explored the effects of specific phytogenic substances in the growth and formation of biofilms in Escherichia coli and Salmonella enterica bacteria. It determined the lowest concentrations that could inhibit bacterial growth and quantified the amount of biofilm formed using special assays. The follow-up project MAPOQS continued to develop these assays further to test how different phytogenic substances work together, e.g. whether their impact is enhanced or they complement each other. Furthermore, the project examined new parameters to enable a better understanding of the effects of the substances on quorum sensing mechanisms in bacteria. This was done through observing bacterial processes that are controlled by quorum sensing, such as pigment formation in Chromobacterium violaceum and bioluminescence in Vibrio harveyi, following treatment with phytogenic compounds. Additionally, special methods were used to analyse changes at molecular levels.

The combination of all the parameters analysed during the project allowed the identification of phytogenic substances with particularly strong effects on quorum sensing in bacteria. The results led to valuable findings for the project partner for the prototype formulation of feed additives. Subsequent studies in the laboratory (in vitro) and in animals (in vivo; carried out by the project partner) confirmed the effectiveness of the prototypes. A better understanding of the mechanisms of phytogenic compounds on bacterial communication processes can be used to develop new feed additives and help with sustainable, healthy livestock farming.

**Head of Project AGES:** Anika Weitmann MSc and Mag. Dr. Sonja Axmann
**Project coordination:** AGES

# Project: ReMeVer - GLP

**Refining the methodology for verifying the GLP compliance of studies submitted within an application for regulated products**

Good laboratory practice (GLP) is a quality management system to ensure that test facilities conduct their studies in a standardised, transparent, reliable manner. GLP is required in many fields, especially when testing substances that are supposed to be released onto the market. The OECD (Organization for Economic Co-operation and Development) published detailed GLP guidelines to serve as an international standard. These standards are verified and updated on a regular basis by the national GLP monitoring authorities. This should help with transparent documentation and administration of the results and ensure mutual international recognition.

The GLP principles designed by the OECD were developed as a control mechanism to guarantee the quality and integrity of laboratory studies. EU Directive 2004/09/EC and 2004/10/EC incorporates the OECD's GLP principles into the EU legal framework by stipulating that studies presented as part of the assessment and admission of substances must adhere to GLP principles. The EFSA (European Food Safety Authority), in its role as the European authority for risk assessment, initiated a project to refine the methodology for verifying GLP studies in all regulated product fields within its scope, setting three main targets:

- defining inspection methods and tools using a practical checklist to verify that GLP principles are adhered to;
- testing methodologies through applying the checklist to a substantial number of studies in various regulatory fields and types of studies; and
- developing a practical training programme for GLP inspectors and science units/risk assessors

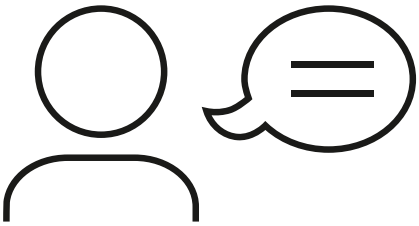
„Around 1,000 studies were checked to test the methodologies developed. The GLP checklist proved to be practicable for the evaluation of GLP studies. Practical exercises and training courses were provided on the EU Academy platform (https://academy.europa.eu/). The project report was published: refining methodologies for verifying GLP studies submitted within an application for regulated products."

- Dr. Tamara Coja, Risk Assessment

The assessment of the studies included two assessment phases: firstly, the identification of GLP observations and, secondly, the evaluation of the scientific reliability of studies where GLP observations were made.

**Head of Project AGES:** Dr. Tamara Coja
**Project coordination:** AGES

# **Presentations** and **Publications** 2024



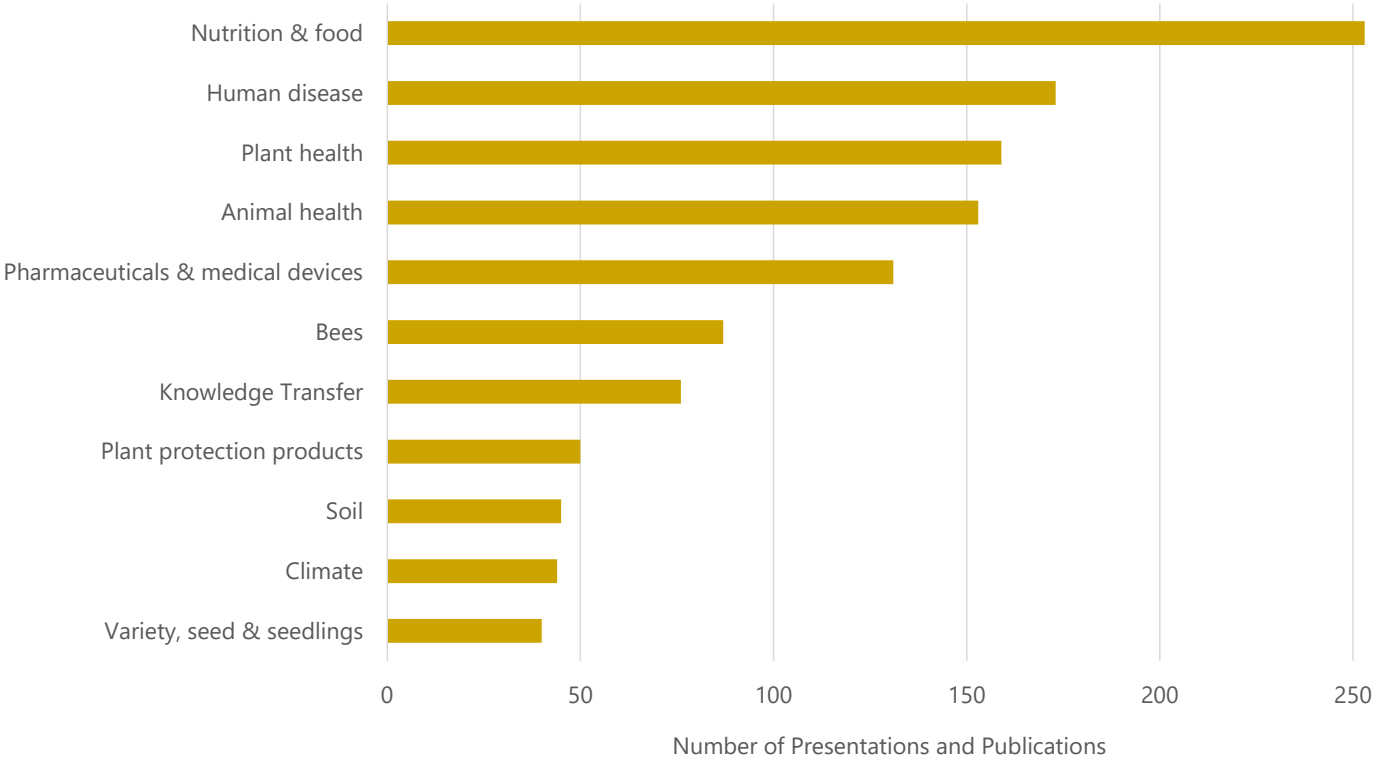
**736 Presentations**

**84 Scientific Publications**

**62 Popular Science Publications**

**114 other Publications** (posters, contributions to conference transcripts...)

## Most frequent research topics 2024




## Most frequent Sustainable Development Goals 2024

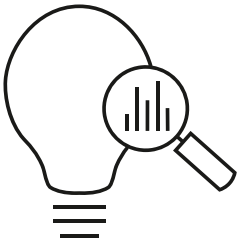

**604 Presentations and Publications**


**458 Presentations and Publications**


**426 Presentations and Publications**

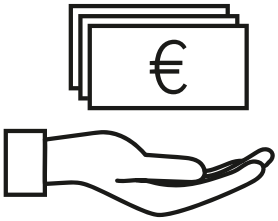

**202 Presentations and Publications**

# Research Projects 2024



**141 current** Research and development (R&D) projects

**61 effectively ended and completed** R&D projects

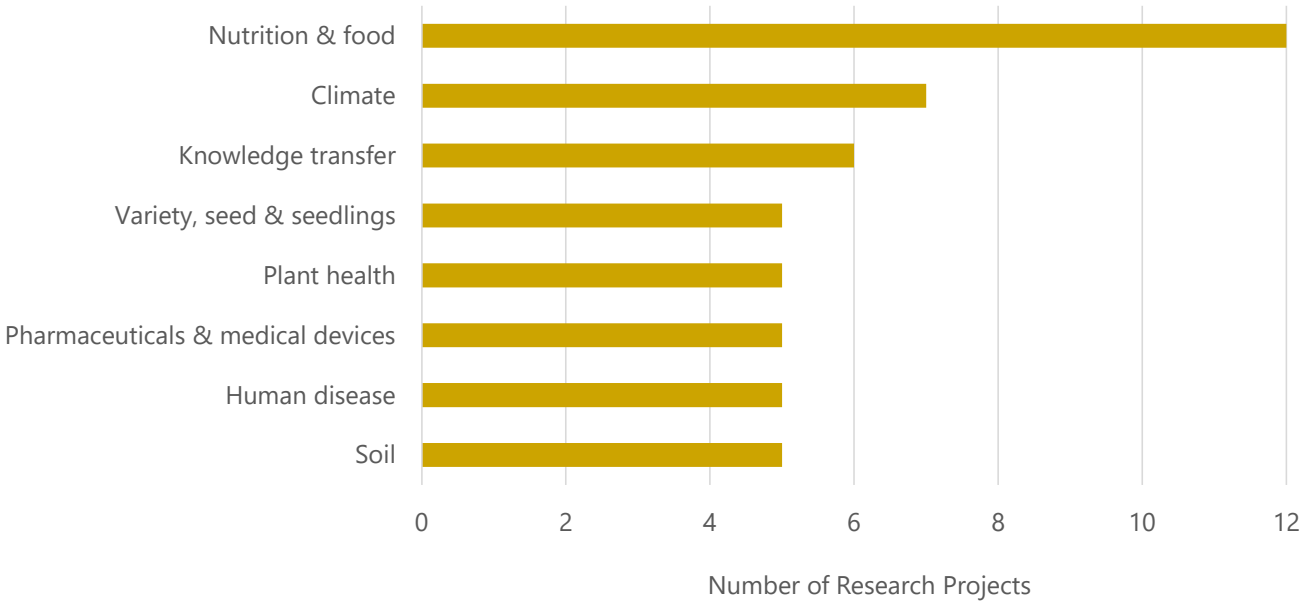


**7.9 %** research quota

**€ 19.4 million** for R&D and knowledge transfer activities

**€ 6.15 million** third-party funding for R&D and knowledge transfer activities

## Most frequent project topics (project starts 2024)




## Most frequent Sustainable Development Goals 2024


**20 Research Projects**

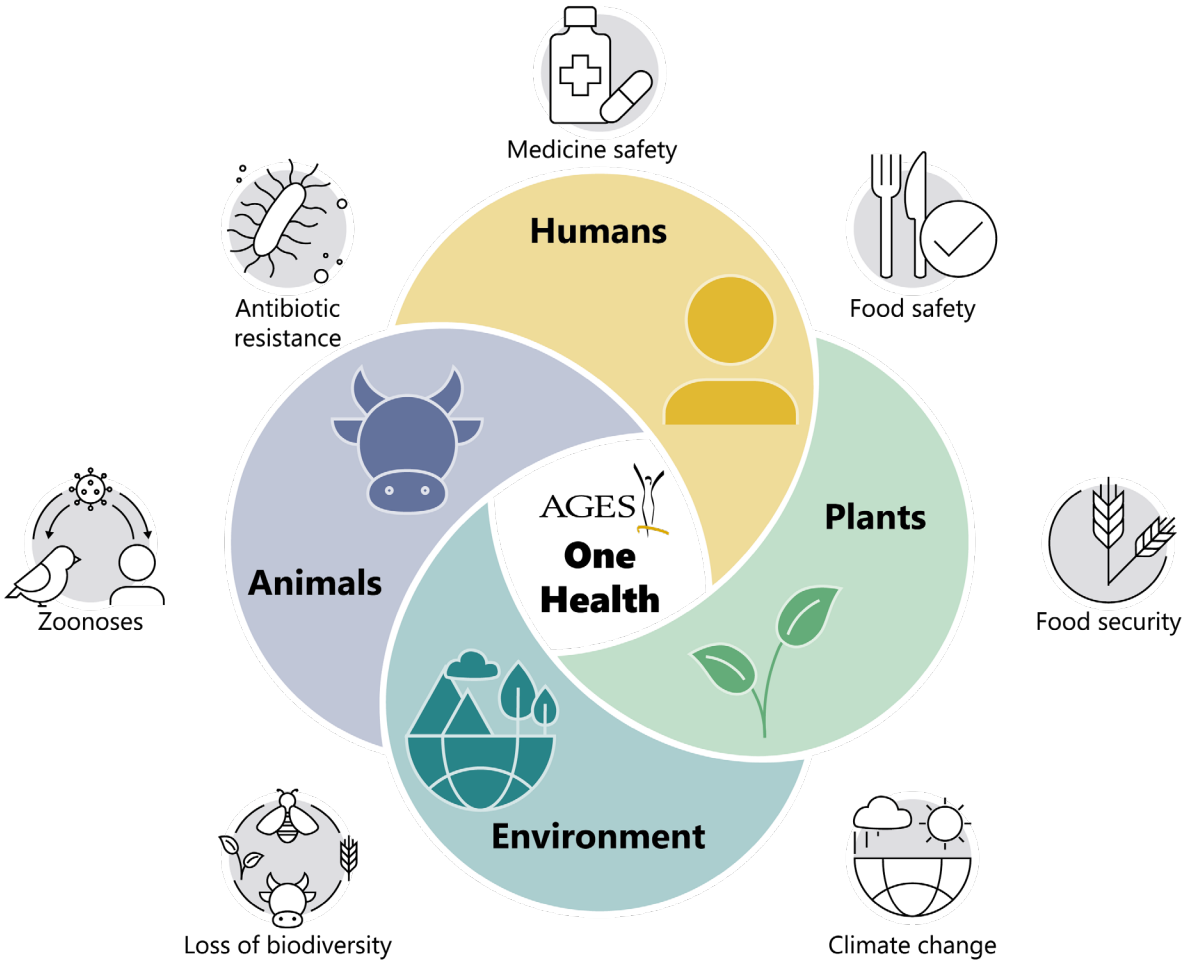

**15 Research Projects**


**10 Research Projects**


**9 Research Projects**

# AGES: **One Health Agency**

The health of humans, animals, plants and the environment are closely interconnected. We have been following the holistic, One Health approach for over 20 years to analyse and monitor changes in the environment and animal health, and their impact on human health. One Health at AGES includes, for example:




More information on One Health can be found on our homepage www.ages.at or by scanning the QR code found on the left.

## Antibiotic resistance

The One Health approach for combating antibiotic resistance is vital: resistance can spread rapidly between humans, animals and the environment.

## Medicine safety

Quality issues, the use of unlicensed drugs and even counterfeit drugs could have severe consequences for humans, and animals, as well as the food produced from these animals.

## Loss of biodiversity

Invasive plants can replace indigenous species and change the structure of our ecosystem. Our genetic data base stores thousands of species of crops and medicinal plants. Additionally, we are striving for the sustainable protection of honeybees in Austria.

## Food security

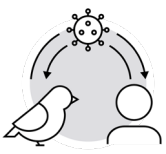
Our aim is sustainable, competitive agriculture with fertile soil and healthy plants to ensure high-quality food for humans and animals.

## Climate change

The early adaption to climate change can reduce damage. One focus at AGES is this adaptation, from the soil to plants and animals to humans.

## Food safety

Chemicals and heavy metals can find their way into our food via animals and plants and affect our health. The One Health approach helps recognise and counteract adverse effects.



## Zoonoses

Pathogens can be transmitted between humans and animals either directly, or via vectors or food. New pathogens might form. We monitor this development and assess food-borne disease outbreaks to prevent future infections.

# European One Health Association

AGES is part of many partnerships and networks, including the European One Health Association (EOHA). The tasks of the EOHA are promoting a One Health approach to fighting antibiotic resistance and zoonoses and supporting a healthy, sustainable food chain across Europe.

This is achieved by building a sustainable, integrated European network of public and academic institutions in the fields of animal health, food safety, medical/public health and related/relevant environmental sciences. Moreover, this promotes One Health research into zoonoses and antibiotics and their interplay between humans, animals and the environment. This provides a valuable contribution for strengthening common EU capacities for the prevention, detection and control of antibiotic resistance and zoonoses in Europe and beyond.

As of today, 33 institutions from 19 European countries are members of EOHA: VetMedUni Vienna and AGES are the Austrian participants. The network was founded in 2004, emerging from the EU project MED-VET-NET which served as the coordinating body for the EU project EJP-One-Health between 2017 and 2024. AGES joined in 2016 and is represented in the EOHA General Assembly and Governing board by DI Mag. DDr. Alois Leidwein and in the Scientific Committee by Priv.-Doz. Dr. Georg Duscher.

AGES took part in several EOHA events and workshops in 2024 to strengthen its partnerships further and share its expertise. The EOHA announces smaller grants for the promotion of workshops and further training every year.

# EU4Health – One vision for a healthier EU

The EU4Health programme was initiated as a reaction to the COVID-19 pandemic and was designed to strengthen EU-wide crisis prevention. The pandemic exposed how vulnerable national health systems are. The programme's mission includes better disease prevention; guaranteed access to drugs, medicinal products and crisis-relevant products; closer and quicker cooperation across borders and the digitalisation of health systems. The EU-wide programme runs from 2021 to 2027. AGES is involved in 14 projects in the EU4Health funding programme:

The Joint Action **JA PreventNCD** intends to reduce levels of non-transmissible diseases, such as cardio-vascular diseases, cancer, chronic respiratory conditions and diabetes. The **EU-WISH** project tests wastewater for viruses for preventative and early alert purposes.

The **SURVector** programme monitors the potential for disease in mosquitoes and ticks. **United-4Surveillance** intends to improve the surveillance, prevention and control of infectious diseases.

**HERA 2** strives to ensure the long-term use and integration of improved infrastructure into routine monitoring and the examination of disease outbreaks. **SAFE-CT** was designed to make clinical trials safer. **HealthData@AT** promotes the digital processing of health data, while **GAPP-Pro** supports the safety of blood, tissue and cell donations for patients and donors. **RAISE** improves pandemic preparations and enables the rapid, valid identification of epidemiological situations for acute respiratory diseases to undertake timely measures.

The **Chessmen** programme is intended to help counteract potential shortages of medicines through better cross-border cooperation. The Joint Action **JA STOCKPILE** project assists Member States in their efforts to refine their national strategies to stockpile medicines. Additionally, **IncreaseNET** is designed to improve the availability of medicines. **JAMS 2.0** and **EU4H11** help intensify the monitoring of medicines. As an example, here is an insight into the EU4H11 programme:

The Joint Action EU4Health11 which is part of the EU4Health programme funded by the European Commission is designed to promote the performance capacity and cooperation of the regulatory agencies for drugs and medicinal products in the European Economic Area (EEA) and boost mutual trust in the respective inspection systems. AGES serves as project coordinator for this European-wide project.


Good manufacturing practice (GMP) describes the standards for quality assurance in the production of medicines and medical products with the goal of producing medicines that are safe and of the highest quality. The JAP (Joint Audit Programme) serves the evaluation of GMP inspection bodies to ensure that they use consistent GMP standards and uniform methods across Europe. The JAP not only contributes to improving mutual trust within the EEA, but also the trust between EEA drug authorities and those from third countries that have signed mutual recognition agreements (MRA) with the EU (e.g. USA, Canada).

EU4H11 is designed to optimise training and qualification processes for both JAP auditors and GMP inspectors and, thus, cooperates closely with the PIC/S Inspectorates' Academy (PIA). Additionally, the project intends to evaluate the potential for improving existing JAP processes. The cooperation between GDP inspectorates inside the EEA is thus boosted and a proposal for the evaluation of drug inspectorates in the field GDP prepared.

The Joint Action is intended to promote the active participation of auditors in JAP, particularly by co-financing efforts to put the programme into practice successfully. Additional training offers and harmonised training and qualification processes should secure the number of qualified auditors and GMP inspectors inside the EEA in the long-term. Furthermore, the project is taking the initial steps towards a European harmonisation and evaluation of inspection systems.

# European Partnerships

AGES is involved in several EU partnerships where research facilities, universities, ministries and other bodies from different EU Member States cooperate. The focus of all these partnerships is on knowledge transfer between EU experts. The individual partnerships run for 10 years.

The partnership **FutureFoodS** is intended to make European food production more sustainable and more resistant to the effects of climate change and food shortages. Food safety should also be improved so that food remains fine for consumption. The **Agroecology** partnership is designed to improve food production to further ensure Europe's food supply, focusing on climate, environmentally and ecosystem-friendly considerations. **Be Ready Plus** is intended to help prepare the EU better for future pandemics and enable the region to deal with crisis situations more rapidly, efficiently and cooperatively. **EUP OH AMR** (European Partnership on One Health Antimicrobial Resistance) is focused on improvements in dealing with antibiotic resistance. Moreover, AGES is a partner in the EU partnership **EUPAHW** (European Partnership Animal Health and Welfare) which is described in more detail below.

## European Partnership Animal Health and Welfare

This partnership harmonises monitoring programmes relevant to animal health across Europe. Measures, such as diagnostic procedures and methods, are being developed as part of this international cooperation and should lead to an improvement in animal health. Additionally, risk assessment and alert systems are being adapted to requirements in the field of animal health and protection. Another focus in this partnership is the prudent use of antibiotics and ensuring high animal protection levels in every phase of the life of an animal. This includes birds, land and water animals.


Diseases found in animal production are responsible for losses of about 20 % animal stock. This also damages the domestic economy. Furthermore, the increasing threat of invasive diseases poses a high risk for the farming sector, especially vector-borne diseases (= diseases transmitted by ticks, mosquitoes, fleas etc.).

The partnership is intended to provide tools for combating infectious animal diseases including the prudent use of antimicrobial substances and a monitoring programme for them. This will contribute to sustainable husbandry and animal protection and will also protect public health

and the environment. To achieve this, the collaboration between public research and development facilities, authorities, the animal health industry and other interest groups is being promoted. The partnership is also forming stronger networks to boost Europe's capacities for rearing healthy animals and improving animal protection standards. This is the reason for harmonising the surveillance and monitoring programme to combat zoonoses and animal epidemics successfully and promote the surveillance of diagnostics and the development of diagnostic methods and vaccines.


The partnership, initiated in 2024, is expected to invest 360 million euros over a period of seven years. To date, the partnership has brought together over 90 institutions (research facilities, financing organisations and ministries), including the EFSA (European Food Safety Authority) and the EMA (European Medicines Agency), from 24 countries.

The partnership comprises 17 three-year research projects. AGES is involved in the following projects, which started in January 2024:

**A European wildlife network for terrestrial and aquatic mammals and birds (SOA06)**: the aim is to include the health of wildlife and birds in the monitoring of farm animals. This is designed to help detect pathogens early and minimise the risk of the transmission of infectious diseases between wildlife, farm animals and humans.

**KNOW-PATH - Knowledge on priority pathogens, infectious diseases and their detection methods (SOA11)**: this project prioritises pathogens that are relevant to farm animals, cause economic losses and show zoonotic potential. Additionally, it is designed to gather basic knowledge on these pathogens and their host species, and their adaptations to their hosts and biomarkers. AGES is the project coordinator for this research project.

**Develop tools such as vaccine platforms and expression systems, immunological toolboxes and delivery systems (SOA21)**: the aim is to identify and improve vaccine antigens, set up vaccine platforms, evaluate different application strategies and develop an evaluation scheme for host reactions to vaccines and vaccine adjuvants (=compounds that increase the immune response to a vaccine).

# European Joint Programme: EJP Soil

**Towards climate-smart, sustainable management of agricultural soils**

EJP SOIL is a joint European programme for agricultural practices tackling critical challenges such as climate change and future food supply.

The objective is to improve agricultural soil management by finding synergies through research, boost research partnerships and sensitise the public to this topic. Over 1100 experts from 24 countries are working on different aspects of soil management in various European agricultural ecosystems.


Innovative soil management plans should improve the performance of ecosystems, reduce erosion and prepare the agricultural sector for future climate change mitigation. A full analysis of SMPs and their ability to support several goals – agricultural productivity, ecosystem performance and biological geochemical cycles – has yet to be conducted. This is why the i-SoMPE project will document these innovative agricultural practices systematically using a survey approach. The data will be gathered taking technical and ecological conditions and socio-economic challenges into consideration. This will form the basis for the development of context-specific, thematical maps to assist political decision makers in identifying the most effective, sustainable SMPs for a climate-friendly approach.


This project is focused on analysing the interaction between carbon capturing in soil and emissions of nitrous oxide and methane, as well as the loss of nitrates. The research looks at how different carbon-binding, soil management measures also affect the environment. The project involves a comprehensive assessment and summarising of the existing scientific literature (meta-analysis). Additionally, targeted, innovative measurements will be conducted in long-term testing, and long-term, agroecological reactions to different soil management strategies will be simulated.


The project intends to find the best practices for processing and applying external organic matter (EOM), such as compost, manure, biosolids and fermentation residues, on soils. This should help protect climate and soil health. To do this, a number of representative European cultivation systems (farming and winegrowing) were selected taking into account the diverse soil and climate conditions. Carbon sequestration and emission of greenhouse gases are evaluated. The best agricultural management practices will then be defined based on the application scenarios.

EJP SOIL Road4Schemes

The top 30 cm of the soil layer stores 44% of soil's organic carbon. This is affected by soil management. The project is designed to find concrete measures and incentives for carbon sequestration and stabilisation in soils.

EJP SOIL ProbeField

Simple, fast soil analysis conducted directly on fields has the potential to increase the number of samples tested significantly. ProbeField focuses on spectroscopy in the visible light spectrum and close infrared as an alternative to conventional expensive, time-consuming methods to cater for growing demand for fast, cost-effective soil analysis. ProbeField tests the optimal physical and mathematical methods needed to overcome these issues. The aim of ProbeField is to develop a series of processes and methods that can be displayed in a report for reliable point estimation of fertility-related properties in agricultural soils in the field.

CARBOSEQ

Carbon sequestration in soils is a technology that results in negative emissions which could contribute to mitigating climate change. However, there is no full evaluation of how much soil organic carbon (SOC) can be stored in European soils using different management options and there is a dearth of national data on such agricultural practices. CarboSeq has been set up to estimate feasible SOC sequestration potential considering biophysical, technical and economic constraints.

Some of the AGES staff members who have been part of the EJP Soil Programme:

# Knowledge Transfer and Exchange

## AGES Academy

We organise lectures, congresses, conferences and training courses to share and discuss new, proven knowledge about current and future hazards and risks within our capacity as a certified training institution. We teach topics along the food chain, about public health and food security, as part of our training courses for authorities and companies.

"The AGES Academy is constantly striving to the further professionalise and newly develop training courses for authorities, officials and companies along the food chain, as well as for public health topics and food security (also in cooperation with colleges and universities, decentralised or online)."

- Dipl.Ing. Dagmar Vock, Deputy Head AGES Academy

The **AGES Academy** is responsible for planning and carrying out AGES (training) events aimed at the public This includes:

1.) Events on behalf of federal agencies and stakeholder ministries

2.) In-house formats such as events and further training formats in the non-profit sector (in line with legal provisions) and information and further training formats for business partners (private sector offers in the business sector) developed by the **AGES Academy** together with the experts from individual departments.

3.) Guided tours and delegations: AGES offers selected stakeholders (universities, colleges, delegations from international health and food agencies...) the opportunity to become familiar with the AGES facilities and our research methods as part of guided tours.

You can find an overview of our events in our events calendar on our homepage (QR Code). Explore our diverse lecture and training offering. We look forward to your participation!

4.) Knowledge transfer projects: the **AGES Academy** manages and develops the European training programme EU-FORA for the EFSA. The programme aims to expand the pool of experts for food risk assessment in Europe. The **AGES Academy** is the national contact point for applications for the Europe-wide, cross-spectrum training programme Better Training for Safer Food (BTSF), and for people based in Austria participating in it.

Additionally, the **AGES Academy** supports its expert fields in expanding their stakes in capacity-building projects (twinnings, SRSS...) and in public consulting projects for EU institutions (CHAFEA, EFSA, ECDC, EPPO and IOBC, Health and Food Audits and Analysis (HFAA), EU Parliament ...).

## FFG Internships, WIENEXTRA Ferienspiel, Wiener Töchtertag & Co.

**FFG internship** (FEMtech and FFG talents) give students and schoolchildren the opportunity to have an internship in companies such as AGES and extramural research institutions in every field of the natural and technical sciences, with a special focus on climate, the environment, and species diversity. The objective is to share practice-related knowledge through active participation in research projects and guide participants towards applied research, assisted by qualified mentoring at the company involved.

We also offer younger children the opportunity to get to know new things at AGES as part of the **WIENXTRA-Ferienspiel**, in addition to our internship programme. Children can learn about types of flour and how to make bread from them. Furthermore, insects are gathered on a walk through the AGES grounds and examined afterwards, and different wild herbs are explained. Girls are offered a glimpse of how food is examined, information on plant pests and an overview of the many different professions for women at AGES, as part of the **Wiener Töchtertag**.

## AGES Events and Internships 2024

| | | | |
|---|---|---|---|
| **15,808**<br>Participant days | **134**<br>Events at the AGES Academy | **89**<br>Months of FEMtech Internships (female students) | **26**<br>Months of FFG talents (school students) |

# European Food Risk Assessment (EU-FORA)

The EFSA (European Food Safety Authority) is an agency of the European Union. Food safety encompasses fields such as risk assessment, risk communication, and risk management. The EFSA is also responsible for scientific consultation regarding risk along the food chain, making it an important partner for AGES at a European level. The EFSA set up the funding programme EU-FORA (European Food Risk Assessment Fellowship Programme) to promote scientific exchange and cooperation between individual EU member states to combat risks.

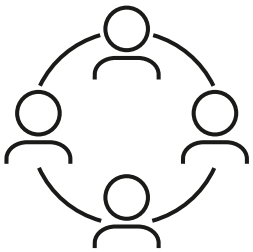
"We are looking to expand the pool of experts for food risk assessment in Europe and encourage the EU member states to participate in risk communication activities to create a common risk management culture in the EU. More than 70 managers from 43 organisations from 18 member states and the United Kingdom, as well as more than 100 fellows, are involved."

- Mag. Christoph Unger, Head of AGES Academy

The European Union fellowship programme for food risk assessment is an important initiative to ensure our preparedness for future demand for risk analyses. The goal of the programme is to increase the number of scientists in the field of food safety and unify the European approach to risk assessment. The programme lasts for 12 months, with one-third of the time spent at a partner agency abroad and the rest of the time spent at the home agency. Five training modules are included, three of which are webinars with contents focusing on different points relating to the food chain. These training modules are conceptualised and conducted by an AGES-led consortium. The language of communication is English.

efsa
EUROPEAN FOOD SAFETY AUTHORITY

# AGES in Numbers (2024)



**1,762 employees (62 % women)**

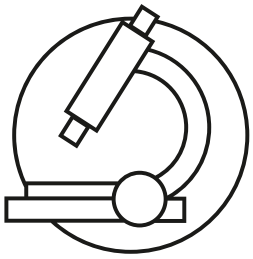
**1,012 Scientific workers (64 % women)**

**197 Senior Experts (60 % women)**

**16 University lecturers (38 % women)**

**15,808 Event participant days**

**134 Events at the AGES Academy**



**3,500 m² Greenhouse area**

**932 Accredited methods**

**141 Current research projects**

**74 Nationale reference laboratories**

**19 National reference centres**

**8 Field study stations**

**3 High security laboratories**

**2 Research greenhouses**

You can find out more about our research activities on our website (www.ages.at) and on the AGES Research Portal (QR Code).

AGES

HEALTH FOR HUMANS,
ANIMALS AND PLANTS

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