YearBOOK

Veterinary Research Institute

VRI

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Contents

Dear readers,

At the Veterinary Research Institute, the year 2024 was marked by intensive scientific activity, strategic investments, and the strengthening of international cooperation. This yearbook offers a comprehensive overview of the Institute's most significant achievements, research projects, and professional activities, reflecting our unwavering commitment to scientific excellence and our ongoing efforts to improve animal health, enhance food safety, and safeguard public health.

Our primary mission continues to be supporting sustainable livestock production, promoting prudent antibiotic use, and enhancing animal husbandry standards. This mission is reflected in the thematic focus of our professional activities, which concentrate primarily on topics related to infectious and non-infectious animal diseases, exploring alternative approaches to antibiotic use, ensuring the biological and chemical safety of food, and developing reproductive biotechnologies.

These activities were made possible mainly through financial support, particularly from the Long-Term Conceptual Development of Research Organization project, funded by the Ministry of Agriculture. The year 2024 was the second year of its implementation. Together with 40 other special support projects—including four international ones—we achieved a total of 111 publication outcomes, 70 of which were published in journals with an impact factor exceeding the median in the respective field.

An important part of our work was the implementation of the project National Centre for Biotechnology in Veterinary Medicine (NaCeBiVet), funded by the Technology Agency of the Czech Republic. As part of this project, 35 applied results were achieved, as evaluated by the Register of Information on Results (RIV). Among these, a highlight was the registered probiotic product QuoCNA, which received the Golden Ear award at the agricultural fair Země živitelka.

From a scientific and professional perspective, the year 2024 can be considered exceptionally successful. On the other hand, we observed a slight decline in contract research compared to previous years. Nevertheless, we consider the revenues amounting to CZK 15 million (more than 7% of the Institute's budget) a creditable result.

Research in biotechnology and the use of in vivo models make the VRI a unique research infrastructure. However, its operation is energy- and cost-intensive and highly dependent on reliable staffing. Considering potential funding shortfalls, in 2024 we devoted substantial effort to preparing project proposals for Operational Programme calls aimed at reducing energy demands and further developing the research environment.

We also devoted special attention to the institutional setup of activities in areas such as staff training in intellectual property, cybersecurity, strengthening resilience to external influences, and the advancement of internationalisation. Preparation for implementing the Open Science policy continues to be an important independent area.

We hope that this yearbook will offer you a comprehensive insight into our activities over the past year. We wish to express our deep appreciation to all employees, partners, and supporters – your expertise, trust, and collaboration have been invaluable to our success. The year 2024 was marked by intensive work, growth, and the emergence of new challenges. We look forward to the opportunities the future holds – and we hope to continue pursuing them together with you.

Doc. MVDr. Martin Faldyna, Ph.D.
and Authorship Team

Medium-term goals until 2030

SWOT ANALYSIS

Strengths

- Scientific area - high proportion of publications in journals with impact factor (IF)
- The capability to produce results with high potential for practical application
- High-quality scientific infrastructure with possibilities for further expansion
- NCC Project - National Centre for Biotechnology in Veterinary Medicine
- Strong partnership with industry
- Economic stability and commercial capabilities
- Implementation of the HR Award personnel policy since 2022

Opportunities

- Introduction of a new product to the market
- Biotechnology Prototype Laboratory
- Cleanroom laboratory for establishing good manufacturing practices to scale-up production
- Expanded workplace of experimental animal facilities in BSL 3 mode
- Political and environmental challenges
- Overlap with public health and the application of One Health principles
- Structural projects of OP JAK, OP TAK, and others

Weaknesses

- International relevance in securing projects
- PR strategy and public communication
- Information Technology and the digitalisation of processes
- Financial incentives for young researchers
- Popularisation of R&D

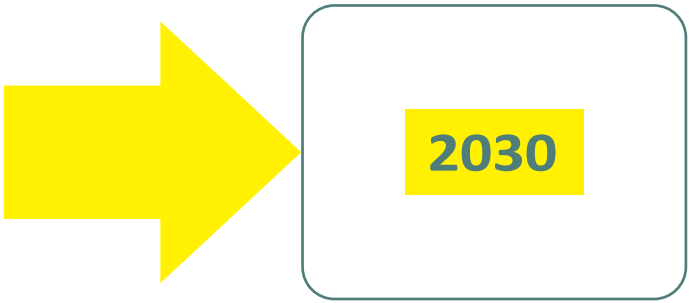
Threats

- Alterations in R&D funding at the institutional level
- Uncertain funding sources for development and strategic goals
- Legislative changes and industry disinterest in research results
- Demotivation of young researchers

Justification of the operation and future of the VRI

VISION

Conducting high-quality research for transfer to practical users in veterinary medicine and agriculture for the benefit of the society and in alignment with One Health principles.



MISSION

THE FOLLOWING VALUES ARE CONSIDERED AS CRUCIAL BY THE INSTITUTE'S MANAGEMENT:

Support for excellence and innovation- developing science and innovation in veterinary medicine with the aim to improve animal and human health

Social responsibility - accepting suggestions from the professional community to address societal needs

Partnership and collaboration- research in collaboration with domestic and foreign partners, including the dissemination of results and their transfer to end users

Respect and diversity - an environment where everybody feels respected and motivated

GOALS

The Veterinary Research Institute has long been dedicated to research in the following areas:

- **Prevention**
- **Control**
- **Diagnosis and treatment of animal diseases**
- **Welfare and health care of farm animals**

The Institute also conducts scientific research at the intersection of animal, human, and environmental health, in line with the **One Health** philosophy, particularly in **food safety, wildlife and ecosystem health, zoonotic diseases, and scientific support for public policy.**

Strategic priorities of the VRI for 2025

1) Scientific area

The Institute's goal is to maintain and increase the number of publications in professional journals with impact factor above the median of the specific fields. At the same time, it will focus on strengthening its publication activity in journals aimed at professional and agricultural audiences to enhance the transfer of scientific knowledge into practice.

2) Application area

The goal is to increase the number of outcomes with legal protection (utility models, patents) and to increase their dissemination through licencing. The Institute will establish collaboration with commercial partners with the aim of more effectively utilising the results of applied research and to better tailor research topics to the needs of practice. An integral part of this strategy is increasing the volume of finances through invoiced activities.

3) Project area

One of the priorities is to maintain a stable volume of resources from targeted support projects Furthermore, the Institute will focus on increasing the number of projects implemented in collaboration with industry partners and on expanding the portfolio of international projects—both in terms of their number and the overall volume of funding.

4) Development area

In the area of sustainability and infrastructure, the Institute will continue in reducing the energy demand of its buildings and diversification of energy sources. Further development of new scientific infrastructure and technical facilities is planned with the aim of strengthening the capacity for modern research. In the field of human resources, the focus will be primarily on the adaptation to new trends in technology and the use of the potential of modern and emerging technologies in both the scientific and operational activities of the Institute.

TOOLS FOR ACHIEVING THE INSTITUTE'S GOALS

To achieve its strategic and professional objectives, VRI employs a group of tools that help manage research, application, and development activities effectively and in line with the Institution's long-term direction. The crucial tools include:

- **An internal evaluation system** that enables continuous monitoring of the performance of research teams and individuals, including both qualitative and quantitative outcome indicators.
- **Bonus and Licence Rules** that motivate employees towards high performance and innovation through a transparent system of bonuses and interests in applied results.
- **Strategy of the Long-term Conceptual Development of the Research Organization**, which defines the continuity and coherence of strategic planning, including an emphasis on strengthening infrastructure, human resources, and international collaboration.
- **Creation and efficient use of the property reproduction fund** that enables investments in the renewal and development of instrumentation and technical equipment.
- **Efficient use of specific resources,** particularly that from public tenders, structural funds, and contractual research.

These tools provide essential support for the implementation of the Institute's research strategy while enhancing its flexibility and competitiveness in a dynamically changing research environment.

INFRASTRUCTURE AND INVESTMENT DEVELOPMENT

The Institute's premises offer considerable opportunities for further development and renovation of its infrastructure: In 2024, the Institute focused on both developing of specialized workplaces and improving the energy efficiency of its buildings.

The Institute includes a newly built **semi-operational Grade "D" cleanroom.** It is designed for the development and production of semi-solid and liquid medicinal and cosmetic forms for non-injectable use, including veterinary drugs and preparations. Its establishment represents an important step towards the practical application of scientific knowledge in pharmacy and veterinary medicine.

In October 2024, under **Call No. 8 of the Operational Programme Environment**, a proposal was submitted for a project focused on **reducing the energy consumption of public buildings and increasing the use of renewable energy sources**. The total project budget amounts to CZK 42 million, with the requested support amounting to CZK 17.5 million. The project builds on the implementation of the institute's **energy savings strategy based on the EPC** (Energy Performance Contracting) model.

Regarding research background, the Institute is equipped with **state-of-the-art laboratories for work under both infectious and non-infectious conditions**, as well as **experimental animal facilities** that allow experiments to be conducted at a high level of biological safety (**BSL-3**). This infrastructure provides excellent conditions for conducting complex research projects in infectious diseases, immunology, and veterinary pharmacology.

STRATEGIC INVESTMENTS IN SCIENTIFIC INFRASTRUCTURE

As part of the Institute's medium-term development plan, key infrastructure priorities have been defined to further strengthen capacities for modern biomedical and veterinary research, while also enabling more effective transfer of research results to end-users. The strategic plans include in particular:

- **Construction of a Veterinary Biotechnology Prototype Unit (PROBIOVET)**, which will serve for the development, testing, and transfer of new technologies into the application sphere. Its main benefit will be the increase in the technological readiness levels (TRL) of research results and shortening the path to their practical application.
- **Expansion of experimental animal facilities for infectious-disease research under BSL-2/BSL-3 regimes,** which will enable research experiments on large animals under conditions meeting high biological safety standards. This capacity is especially crucial for the study of infectious diseases and the development of veterinary vaccines and therapies.

The implementation of these strategic projects will significantly strengthen the Institute's technological background and improve its readiness to address research challenges in animal health, food safety, and biological protection.

Significant Events

The Veterinary Research Institute extends its congratulations to the gorilla family and Prague Zoo on the birth of a gorilla cub. Professor Rubeš' team from the Department of Genetics and Reproductive Biotechnologies ascertained that the newborn is a female.

The baby Western lowland gorilla Duni, born in Prague Zoo on 2 January, is a female. The sex was determined through a special blood test carried out at the Veterinary Research Institute. The sex was confirmed using a special examination, during which DNA was isolated from the umbilical cord blood and umbilical cord.

„First, we isolated DNA from the placenta and umbilical cord. Then we subjected the DNA to the polymerase chain reaction with special primers, which means that we used the primers to amplify a section located on the Y chromosome, which carries the SRY gene determining the male sex," explains Prof. Rubeš. „The DNA was then used in gel electrophoresis to determine the presence of the gene. When the absence of the gene was identified, it became clear that the offspring is female. On the other hand, if it had been present, the offspring would have been male, he added." (source: Prague Zoo) https://www.zoopraha.cz/aktualne/novinky-u-zvirat/14529-prvni-gorili-mlade-v-rezervaci-dja-je-samicka-verejnost-pro-ni-vybere-jmeno

The VRI has long been cooperating with zoological gardens, primarily with Prague Zoo and Dvůr Králové Zoo, on several grant projects. However, this cooperation is not limited to the Czech Republic. For example, our team has participated in the identification of pure-lineage karyotypes of the dik-dik at Leipzig Zoo. The Department of Genetics and Reproductive Biotechnologies has also been involved in karyotyping and sex determination in orangutans and other species, including the aardvark, not only from blood samples but also non-invasively from hairs.

Another gorilla cub is expected at Prague Zoo, and Prof. Rubeš can look forward to continuing the collaboration!

Commemorative Medal Presented to the VRI

On 6 March 2024, the 50th Annual Conference on Quality of Food and Food Raw Materials, known as „Ingr Days“ was held at Mendel University in Brno.
On this occasion, the Veterinary Research Institute was awarded the Commemorative Medal for its merit in cooperation with FoodTech, Faculty of AgriSciences, MENDELU.

The cooperation was based on verifying the effects of pig feed supplementation with fish oil on the levels of polyunsaturated fatty acids in pig tissues, as well as on biochemical parameters and inflammation markers, and the technological and sensory properties of slaughterhouse products.

VRI Hosts the ECBHM

ECBHM, the **European College of Bovine Health Management**, is a veterinary specialty organization focused on advance health-oriented bovine production management. Twenty-three young veterinarians, residents of the ECBHM, gathered in Brno on 23 and 24 April 2024, at the Veterinary Research Institute. Professor Dr. Volker Krömker, Dip. ECBHM, from Hochschule Hannover initiated the organisation of this prestigious event specifically to be held at the VRI. The ECBHM residents, under the guidance of three top experts, participated in the „Udder Health Workshop" primarily focusing on udder health through a model farm audit. Therefore, the workshop participants visited the farm of MVDr. Václav Osička, which housed 300 dairy cows. They thoroughly inspected, measured, and observed its routine operations to assess the current state of udder health and conditions affecting it. It was essential to gather as much information as possible about the local raw milk production process. On the following day, they conducted their expert work at the VRI, which included preparing a farm audit, identifying critical points, and proposing short- and long-term measures to improve the health of the udders of housed cows. The audit conclusions were ultimately presented to the management and staff of the farm, along with other attendees. A discussion ensued, and gratitude was extended for the suggestions by Dr. Osička.

In addition to the professional programme, the Director of the Institute, MVDr. Martin Faldyna, Ph.D informed the participants about the mission of the Institute and its activities, with a focus on cattle health issues. Dr. Faldyna also emphasized the role of the Czech Academy of Agricultural Sciences, which has contributed to shaping the direction of applied research in the agricultural sector for 100 years. The visit to Brno also included a guided tour of the city. The entire event was organized and data managed by VRI staff members MVDr. Petr Fleischer, Ph.D. and Doc. MVDr. Soňa Šlosárková, Ph.D. Financial support for the smooth running of the event was provided not only by VRI but also by Tekro, spol. s r.o. and BIOPHARM, Research Institute of Biopharmacy and Veterinary Drugs.

Collaboration with the International Atomic Energy Agency (IAEA) in the Field of Antimicrobial Resistance Research

This collaboration represents an important step toward the Institute's global engagement in addressing current issues in both animal and public health. The International Atomic Energy Agency (IAEA) is not merely an agency concerned with the peaceful use of nuclear technologies for power generation and medical applications. For example, in partnership with the Food and Agriculture Organisation (FAO), it supports sustainable agricultural production.

A crucial issue common to both human medicine and agricultural production is combating antimicrobial resistance. The IAEA is contributing to this agenda by funding coordinated research endeavours, as part of the recently launched five-year project titled „Innovative Nuclear and Related Molecular Approaches for Detection and Characterization of Antimicrobial Resistance in Animal Production Environment".

In mid-April 2024, the Vienna International Centre hosted the inaugural meeting of "mentors" from higher-income countries with colleagues from lower-income countries, particularly from African and Asian regions. Among the mentors was also Doc. RNDr. Ivan Rychlík, Ph.D., the Head of the Department of Microbiology and Antimicrobial Resistance at the Veterinary Research Institute. Doc. Rychlík is an expert in the use of innovative mixtures of probiotic cultures for the targeted colonization of newly hatched chicks, with the aim of enhancing their natural resistance and thereby reducing the need for antibiotics. These methods have been repeatedly validated through projects of the National Agency for Agricultural Research and the National Centre for Biotechnology in Veterinary Medicine (NaCeBiVet) project, funded by the Technology Agency of the Czech Republic.

Max Planck Society to Collaborate with CEITEC

The Max Planck Society for the Advancement of Science is a non-governmental association of German research institutes based in Munich. Patrick Cramer, President of the society — one of the most renowned scientific organizations supporting basic research — visited Brno and several CEITEC Consortium sites.
On this occasion, on May 16, 2024, he signed a Memorandum of Understanding together with representatives from the institutions comprising the CEITEC Consortium – Masaryk University, Brno University of Technology, Mendel University in Brno, University of Veterinary Sciences Brno, Institute of Physics of Materials, and the Veterinary Research Institute – alongside Pavel Tomančák, the Consortium Director. The content of the Memorandum encompasses collaboration in research and support for the mobility of researchers.

VRI to Participate in Commercialisation of Its Research

On 7 June 2024, the VRI initiated further commercialization of its research results by signing an agreement with Reform Therapeutics CZ, s.r.o. on the joint development of a new formulation for mucosal administration of active substances. This collaboration builds on the results of the project entitled „FIT- Pharmacology, Immunotherapy, (nano)Toxicology“, which was funded within the call Support of excellent research teams of the Operational Programme Research, Development, and Innovation under the No. CZ.02.1.01/0.0/0.0/15_003/0000495. This project was implemented at the Institute between 2016 and 2022. The project focused on the comprehensive study of biocompatible nanoparticles and their use in the field of biomedicine, particularly in the development of recombinant vaccines, targeted therapeutics (antivirals, cytostatics), and theranostics. Besides achieving all planned monitoring indicators, the project implementation also involved construction modifications of selected facilities within the Institute‘s premises. These facilities have been prepared for conducting small batch production processes under the appropriate quality assurance regime.
A key role of VRI will be to carry out formulation work, conduct preclinical pharmacokinetic and pharmacodynamic experiments, produce a prototype, and perform stability studies
The new formulation will be the subject of an international patent application. The new products are expected to be on the market as early as 2026.

A Workshop Focused on Innovative Approaches and Strategic Decision-making in Veterinary Diagnostics

Properly established diagnostic procedures are a prerequisite for understanding the current situation in individual herds as well as for implementing subsequent preventive or therapeutic measures. Despite significant technological and interpretative advancements in diagnostics over time, there remain areas that need improvement. The aim of the workshop was to discuss the formulation of new topics for strategic decision-making and for shared research and development projects. Representatives of regulatory authorities, researchers and developers, producers, and end-users attended the workshop.

The event took place within the framework of the National Centre for Biotechnology in Veterinary Medicine (NaCeBiVet) to define future directions in research and development in veterinary medicine, livestock industry and pet animal care. One way to identify the needs is to moderate an internal discussion among consortium members and other relevant interest groups. That is exactly what came to fruition on 25 June 2024, when, within the framework of the partial project titled the Management of the Centre and its Strategic Agenda, it took place in the Large Meeting Room of the Veterinary Research Institute.

The entire programme was structured into three panels. The legislative panel summarised information on the legal framework for the approval of veterinary technical products, which includes the diagnostics. This was followed by a presentation of the rules and recommendations of the World Organisation for Animal Health (WOAH) for diagnosing infectious diseases in animals. An important aspect for the entire area is that, unlike human medicine, veterinary legislation is harmonised at the European Union level. Therefore, the diagnostic methods for a relatively large number of diseases are specified centrally. The second panel focused on innovations in technologies applicable in diagnostics, which was appropriately complemented by the experience of end-users with the development process from inception to product launch in the market. In the third panel, which became part of the subsequent overall discussion, current diagnostic possibilities in cattle, pig and fish farming were presented. The outcomes will be utilised to guide further directions of research and strategic activities of the Centre within both national and international contexts.

Reflection on the Agricultural Fair “Země živitelka” 2024

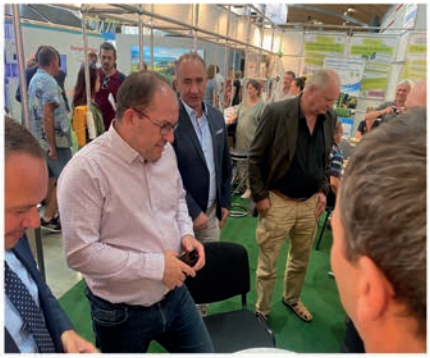
The 50th Agricultural Fair Země živitelka ”Bread Basket“ took place from 22 to 27 August 2024, attracting nearly 130,000 visitors — the highest attendance in the past 20 years.

The Agricultural Fair included a joint exhibition of public research institutions of the Ministry of Agriculture, including the Veterinary Research Institute. The presented results of applied research and development included, for example, Dr. Marková‘s information on the bacterial disease caseous lymphadenitis in small ruminants, and Dr. Šťastný‘s on residues of anabolic steroids in food of animal origin. We also provided details about various research activities and offers for the agricultural community, including the VRI ACADEMY series of educational seminars, and addressed many questions regarding scientific research, the Institute, and animal diseases.

However, the most interest was attracted by the probiotic QuoCNA, designed to protect chickens from infectious diseases and enhance their immunity. The product contains nine defined bacterial strains, has a relatively simple formulation, and none of these strains carries genes for antibiotic resistance. The Institute received the “Golden Ear“ Award for this product. This award is a notable acknowledgement of the efforts of the team led by Doc Rychlík.

The stand was also visited by the Minister of Agriculture, Marek Výborný, along with his staff, and other representatives of the Ministry of Agriculture, the State Veterinary Administration and the breeder‘s community. We thank everyone who came to discuss the importance of applied research in the agricultural sector.



XXXI Symposium on Xenobiochemistry

In September, Dr. Machala's group from the Department of Pharmacology and Toxicology at the Veterinary Research Institute hosted a Xenobiochemical Symposium to continue the long tradition of joint Czech-Moravian-Slovak meetings. The event took place at the Kyjov Brewery on 18- 20 September 2024.
The main topics, according to the submitted contributions, were:

1. Biotransformation enzymes and transporters
2. AhR, nuclear receptors, mechanisms of toxicity and carcinogenicity of xenobiotics (organ toxicity, endocrine disruption, endogenous metabolic disorders, neurotoxicity, genotoxicity, tumour promotion and progression)
3. Chemoprotective properties of xenobiotics, anticancer drugs, biomedical materials, nanoparticles/nanotoxicology
4. Modern methodological approaches (current status of "omics" in xenobiochemistry, cellular stress markers, exosomes, etc.).

Consistent Contact with Practice is Beneficial for Both Parties

The Veterinary Research Institute hosted representatives from the Dutch company Kernfarm and their colleagues from practice on 26 September 2024. The visit was organized by representatives of Bioveta, a.s. The aim of the visit was to present the Institute's activities and key projects to support collaboration with practical users. Dr. Faldyna devoted the introductory part to presenting the Institute, its mission and focus, while emphasizing the importance of result transfer to practical effect. The next part of the meeting focused on selected professional topics and their addressing at the Institute. Dr. Moutelíková from the VRI and Dr. Czanderlová from Sevaron s.r.o. presented their findings in epidemiology of rotavirus and clostridium infections in pigs, which were made possible, among others, through the implementation of a partial project funded by the National Centre for Biotechnology in Veterinary Medicine (NaCeBiVet). The presentations led to a discussion on practical experience in disease prevention, focusing on possibilities and tools to enhance the breeding community's interest in prevention programmes. The discussion also highlighted the need for consistent information exchange between researchers and practical users.

Visit from the International Clinical Research Centre (ICRC)

On 4 October 2024, Prof. RNDr. Michal Masařík, Ph.D., the new Head of the International Clinical Research Centre (ICRC), visited the Institute. The main purpose of the visit was to learn about the joint research workplace, which has been in existence since September 2020. The Institution enables the use of animal models in research on human diseases. Other collaboration opportunities were also discussed, including joint projects with special support and contract research. The most intensive cooperation to date is in the fields of cardiology and interventional cardiac electrophysiology. Additionally, collaborations exist with teams within the ICRC in the areas of stroke research and cellular and molecular immunoregulation.

Hands-On Training for Breeders and Veterinarians: New Measures to Combat Antimicrobial Resistance

On 21–22 November 2024, hands-on training for veterinarians and farmers was held in Brno at the Atlantis Hotel. The event focused on new measures to combat antimicrobial resistance (AMR), which occurs when microorganisms causing infections become resistant to the drugs used to treat them. As a result, diseases spread more easily, persist, and can potentially become fatal.

The training is held across European Union countries. The main organizers are the Federation of Veterinarians of Europe, together with the European Commission. In the Czech Republic, the organisation was undertaken by the Veterinary Research Institute, based in Brno-Medlánky.

The aim of the workshop is to provide veterinarians and farmers with insights into legislative updates and practical measures for reducing the use of antimicrobial agents and improving health standards in agriculture. The event held in the Czech Republic attracted about sixty participants, including practical veterinarians, farmers, supervisory inspectors from Regional Veterinary Administrations, laboratories, and other experts from both the Czech Republic and abroad. The aim was to raise awareness of the relevant legislation, but above all, the event included practical lectures, group exercises, and discussions of case studies

National Competence Centre NaCeBiVet Workshop on Advanced Methods in Dairy Cattle Reproduction

On 10 October 2024, a thematic workshop with a panel discussion on advanced methods and new trends in dairy cattle reproduction was held within the framework of the National Competence Centre NaCeBiVet. The event followed a workshop on assisted reproduction and provided a platform for experts to discuss the current requirements, barriers, and opportunities for collaboration in reproductive biotechnology for cattle breeding in the Czech Republic.

The workshop participants comprised representatives from the Ministry of Agriculture of the Czech Republic, farm owners, breeders, members of the Czech-Moravian Breeders Association, a.s, field workers specializing in embryo transfer, and experts from research institutions such as the VRI and the Institute of Animal Science.

The discussions included presentations on the assignments currently being implemented in NaCeBiVet's partial projects, which aimed at practical outcomes for breeders. Participants exchanged their experience related to the use of reproductive biotechnology in the Czech Republic, compared them with those in neighbouring countries and discussed global trends.

One of the main topics was the demand for in vitro embryo production services. The discussion pointed to the limited capacity in services for breeders, including embryo production and follow-up services in genomic procedures in breeding and embryo transfer.

"Even though it appears there is interest in these services, it is probably not to the extent that it fully meets the needs of a commercial workplace," said Doc. Anger, the guarantor of the research direction. "Therefore, it is essential to connect research with practical service so that it can be provided efficiently and sustainably in this area," added Doc. Anger.

At the conclusion of the workshop, participants concurred that effective collaboration between research institutions and breeders can support the development and application of modern reproductive biotechnology in dairy cattle breeding in the Czech Republic.

About the research direction Biotechnology in reproduction under the National Centre of Competence NaCeBiVet:

It focuses on supporting research and development in reproductive biotechnology and its application in farm animal breeding, particularly in cattle, with the aim of increasing herd efficiency and sustainability through innovative solutions.

VRI ACADEMY: Educational Seminars Hosted by VRI

In 2024, the Veterinary Research Institute (VRI) in Brno hosted a total of 12 seminars and workshops within the framework of "VRI ACADEMY." These events were funded through the Rural Development Programme and the Czech Technology Platform for Agriculture, of which VRI is a member. The educational events were predominantly intended for professionals in primary agricultural production, veterinary medicine, beekeeping, aquaculture, and the food industry. They present new research findings with practical applications. The speakers included VRI's scientific staff as well as other specialists from partner research institutions, universities, and professional organizations.

For most of the seminars, proceedings were compiled and are available on the Institute's website at: https://www.vri.cz/archiv-vuvel--academy-a-ctpz/ VRI ACADEMY is organized by Doc. MVDr. Soňa Šlosárková, Ph.D. Several articles for professional journals (such as Veterinářství, Náš chov, Zemědělec, and others) resulted from the series of seminars, further extending the dissemination of the presented information and enhancing its application in agriculture and veterinary practice. Among the seminars with the highest attendance were: Cryptosporidiosis and clostridial infections – Threats to calf rearing; Beef herd health management; Current issues in mastitis control; Bees and their production; and Parasites of sheep and goats in practice.

Outstanding Outcome Awards

QuoCNA Wins the Main Golden Ear Award at the Agricultural Fair Země živitelka 2024

The probiotic veterinary product QuoCNA, despite strong competition, won the Golden Ear Award in the livestock production category at the 50th International Agricultural Fair Země živitelka (Bread Basket) 2024 in České Budějovice.

A team of scientists led by Doc. Ivan Rychlik from the Veterinary Research Institute has developed the new breakthrough probiotic product QuoCNA, which will fundamentally change the protection of chickens against infections and improve their overall health. It is a unique blend of nine bacteria specifically adapted for chickens to modulate their microbiota- the colonization of the microbial flora of the gut. The bacteria do not contain any antibiotic resistance genes, which helps in the combat against global antibiotic resistance. QuoCNA effectively colonises the digestive tract of chicks from their first days of life, decreases the abundance of harmful bacteria such as Salmonella and reduces the need for antibiotics. Approved for marketing by the State Control of Veterinary Biologicals and Medicines in March 2024.

The main award was presented by the Minister of Agriculture Marek Výborný together with the organizers of the event- the Chairman of the Board of Directors of the Agricultural and Forestry Support and Guarantee Fund Doc. Josef Kučera and the Chairman of the Board of Directors of the České Budějovice Exhibition Grounds Ing. Mojmír Severin. The award was presented to Dr. Martin Faldyna, Director of the Institute.

Aworede Emloyee	Awarded by	Date of Award
Doc. RNDr. Eyer Luděk, Ph.D.	Minister of Health	17 December 2024

Projects in 2024

In 2024, the VRI's researchers submitted a total of 37 project proposals under national and international calls for special support. The ratio of submitted to awarded projects reflects both the strong effort to develop research activities and the varying levels of difficulty of individual competitions.
Within the NAZV competition, 2 projects were submitted, of which 1 received funding. In the GA CR grant competition, 14 proposals were submitted but none was successful in the given year. One proposal was submitted under the TA CR – Environment for Life programme and received funding. Significant success was achieved in the AZV CR competition, where 4 out of 11 submitted proposals received support. Under the TA CR TREND programme, 7 proposals were submitted, with 2 obtaining funding. In addition, proposals were submitted under international and structural calls – one application to the EU COST ACTION and one to the OP JAK – Research Environment programme.
The implementation of the National Competence Centre project, "National Competence Centre in Veterinary Medicine" continued, actively encompassing 21 partial projects carried out in collaboration with partners from the application sector. These projects have already generated concrete results of applied research that can be used in practice. (https://www.vri.cz/en/nacebivet/). Through these efforts, the Institute demonstrates its active involvement in a wide range of research programmes and its strategic focus on both applied and basic research. The outcomes contribute not only to scientific progress but also to stronger collaboration with the industry and addressing current challenges in veterinary medicine and related fields.

Development of DIVA ELISA test distinguishing pigs infected by non-typhoid Salmonella serotypes and pigs vaccinated against these serotypes
Investigator at the VRI: Mgr. Jan GEBAUER, Ph.D.

The project will aim to develop the so-called DIVA ELISA into a kit that can be used in a standard diagnostic laboratory. The DIVA ELISA is a tool that enables differentiation serologically between pigs vaccinated with the BioSuis Salm vaccine and pigs after a natural infection caused by non-typhoid Salmonella serovars. BioSuis Salm is a vaccine developed at the Veterinary Research Institute in cooperation with Bioveta a.s., which also produces the vaccine. DIVA ELISA expands the possibility of using the BioSuis Salm vaccine for the recovery of the herd as it enables the elimination of sows that are carriers of the infection.

Development of a new series of sorbents for binding endotoxins and mycotoxins in monogastric animals
Investigator at the VRI: MVDr. Ján MATIAŠOVIC, Ph.D.

The aim of the project is to develop and optimize innovative measures to reduce colony losses caused by the negative impact of the Varroa destructor mite and associated viral infections, set against the context of ongoing climate change. The project outcomes will enable targeted mitigation interventions at appropriate times during the beekeeping season, as well as the development of new supportive, therapeutic, or disinfectant agents that will help beekeepers prevent colony collapse. The project focuses on monitoring the condition, biochemical, immune, and behavioural changes in worker bees and drones naturally parasitized by mites, after experimental viral infection, and following the application of active substances that reduce mite populations. The goal is to gain insights into the molecular basis of the infection, which are essential for the development of treatments and the breeding of resistant lines through instrumental insemination.

Production of recombinant bovine follicle stimulating hormone with controlled release from hydrogels for assisted reproductive techniques in cattle
Investigator at the VRI: Doc. MVDr. Svatopluk ČECH, Ph.D.

The project focuses on a key part of embryo transfer and in vitro embryo production in cattle – the stimulation of embryo and oocyte donors with follicle-stimulating hormone. The project aims at the production of recombinant bovine follicle-stimulating hormone (rbFSH) with controlled release from a hydrogel matrix.
The sub-goals of the project are:
1. Introduction of rbFSH production in a mammalian in vitro system
2. Test of biological activity of rbFSH on bovine oocytes in vitro
3. Preparation of hydrogel matrix for slow release of rbFSH into the bloodstream
4. Test of biological activity of controlled release rbFSH in vivo in cattle.
Achieving the project's subgoals will be the main prerequisite for the subsequent start of production of effective controlled-release rbFSH, which is currently not available on the market

Alternatives to the treatment of bacterial infections in broilers as substitutes for enrofloxacin
Investigator at the VRI: MVDr. Kateřina NEDBALCOVÁ, Ph.D.

The main goal of the project is to propose suitable alternatives to fluoroquinolones for the treatment of bacterial infections in poultry, particularly broiler chickens, with a focus on potentiated sulfonamides. Their effects on the target animal species will be evaluated, and pharmacokinetic studies of selected drug combinations will be conducted in compliance with Good Laboratory Practice (GLP). Based on the data obtained, proposed treatment protocols for selected bacterial infections will be developed, including optimal drug combination ratios, dosage, and duration of treatment. These protocols will be verified through the treatment of experimentally infected broilers. Another goal of the project is screening in broiler flocks – monitoring the epizootiological situation and assessing the antibiotic resistance of bacterial pathogens affecting broilers.

IInnovative synbiotic feed supplement for postweaning piglets
Investigator at the VRI: Mgr. Magdaléna CRHÁNOVÁ, Ph.D.

The current project aims to develop a functional, innovative synbiotic feed for weaned piglets. During the project, yeast strains will be isolated from the digestive tract of wild and domestic pigs, identified and characterized in detail using phenotypic and genotypic methods. At the same time, the existing laboratory collection of lactic acid bacteria also originating from the digestive tract of domestic and wild pigs will be analyzed in detail. Selected bacterial and yeast strains with probiotic potential will then be used together with a prebiotic component to construct an effective synbiotic feed mixture for weaned piglets. It is expected that the project outputs will contribute to increased gain, improved health status of piglets and thus to increased safety and quality of pork.

Strategy for mitigating the influence of the Varroa destructor mite and associated viruses on the health and vitality of bee colonies in the changing climatic conditions of the Czech Republic
Investigator at the VRI: RNDr. Jana PRODĚLALOVÁ, Ph.D.

The project aims to develop innovative approaches for reducing the collapses of bee colonies caused by the negative effect of Varroa destructor and associated viruses in the context of ongoing climate change. The project outcomes will enable the effective targeting of mitigation interventions in the breeding season and the development of new treatments, thus helping apiarists to prevent the collapse of bee colonies. The project will focus on monitoring the fitness, biochemical, immune and behavioural changes of workers and drones naturally parasitised by mites, after experimental viral infection, and after anti-mite treatment, bringing knowledge about the molecular basis of the infection essential for the development of drugs and the breeding of resistant lines using technical insemination.

Omics as a modern tool for the detection of banned growth promoters in fattening food-producing animals
Investigator at the VRI: Prof. MVDr. Miroslav TOMAN, CSc.

The project aims to find highly effective analytical tools for detecting systematic and masked misuse of prohibited growth promoters in the fattening of food-producing livestock. By developing and implementing precise multi-omics-based analytical tools to effective prevent the occurrence and transmission of residues of banned substances in the food chain, which have a demonstrable adverse effect on the health of consumers as well as the animals themselves. In addition to the targeted analytical methods in use, propose a system of non-targeted analytical procedures combining metabolomics, proteomics and transcriptomics approaches that will increase the likelihood of demonstrating prohibited practices, preferably for substances that cannot be demonstrated by currently established analytical methods.

Sustainable parasite control in small ruminants corresponding to the One Health concept
Investigator at the VRI: Doc. MVDr. Adam NOVOBILSKÝ, Ph.D.

Project goals
- to analyse parasite diversity of GI parasites in sheep and goats, with special attention to defying the occurrence and infection intensity of Haemonchus contortus in Czechia
– to develop smart, quick, and original diagnostic tool for detection of Haemonchus contortus in animal faeces based on isothermal amplification of DNA
– to identify unsuitable strategies of helminth control and risk factors for development and spreading of anthelmintic resistance
– to propose, optimize and verify sustainable parasite control strategies for small ruminants in Czechia
– to educate sheep/goat owners and to motivate them towards sustainable parasite control

New insights for reducing the risks of producing edible insects from the perspective of the ecosystem, farmer, and consumer
Investigator at the VRI: RNDr. Jana Prodělalová, Ph.D.

Insects are currently highlighted as an alternative source of protein for both human nutrition and feed with benefits in terms of ecology, economy, and nutritional values. However, this is an area that is still a marginal issue in the Czech Republic. The aim of the project is to obtain new knowledge in the field of infectious diseases of insects and the safety of the produced protein: (1) to supplement the missing information on diseases of farmed insects, where, as in other large-scale livestock farms, the negative influence of infectious agents can be expected; moreover, preventive measures will be suggested and (2) to study links to honey bee diseases, especially from the point of view of possible pathogen transmission between bees and edible insects.

Ensuring the sustainability of efficient dairy farming using genomic breeding using mining data from modern technologies including infrared spectroscopy
Investigator at the VRI: Doc. MVDr. Soňa ŠLOSÁRKOVÁ, Ph.D.

The goal is to define and genomically evaluate new phenotypes of dairy cattle using modern technologies such as milk mid-infrared spectroscopy (MIR-FT) and big data from: milk recording, use of robotic systems, a digital collection of health data of cows, calves and young cattle, databases related to the reproduction and exterior of dairy cows, supplemented by data from special monitoring to obtain data on the body condition or weight of dairy cows. The results- genomic breeding values and selection indices that integrate information from genetics, nutrition, physiology and health- will enable the breeding of more resistant and fertile cattle with better feed efficiency for sustainable food production and lower methane production.

Evaluation of the environmental impacts of feeding alternative protein sources in monogastric farm animals
Investigator at the VRI: Doc. MVDr. Martin Faldyna, Ph.D.

The main goal of the ALTPROT project is to contribute to the reduction of the environmental impacts of animal production by assessing the usability of protein sources - white lupine, extracted meal from sunflower and rapeseed and insect protein (larvae of the black soldier fly) in the nutrition of broiler poultry and pigs, which could serve as an alternative to soy extracted scrap. The monitored outputs will include nutritional, animal husbandry, health parameters, with particular emphasis on animal husbandry parameters, represented by the content of ammonia and methane in the stable air. All the mentioned sources have their advantages and disadvantages. Therefore, one of the goals of the project is to find a suitable combination of these sources so that their use in replacing soy is full-value.

Development of chemotaxis-guided micro/nanorobots for endotoxin and danger-associated molecules elimination for targeted therapy of inflammatory diseases
Investigator at the VRI: Mgr. Hana ŠTĚPÁNOVÁ, Ph.D.

MINISTERSTVO ZDRAVOTNICTVÍ
ČESKÉ REPUBLIKY

Pneumonia represents a serious life-threatening infection and is the leading cause of sepsis-related deaths worldwide. Pneumonia pathogenesis is a very complex process involving the microbial invasion of the lower respiratory tract through community or hospital spread. Despite the broad array of causative agents, bacterial infections remain the dominant pathogen. Bacterial lipopolysaccharide (LPS) is the main cause of excessive and dysregulated immune response responsible for a significant part of pneumonia associated pathology. Furthermore, currently, severe spread of antibiotic resistance represents a serious threat. Novel approaches to eliminate the load of bacteria derived LPS independent on current antibiotics are urgently needed. Micro/nanorobots are at the forefront of nanomedicine due to their impressive capabilities such as autonomous motion, drug cargo delivery, execution of targeted tasks, and navigation in restricted tissues or organs. In this project we aim to develop a multitasking micro/nanorobot actuated by chemotactic stimuli targeting the inflammation area with specificity to eliminate LPS. Nanorobots will be equipped with chemokine receptors enabling their concentration-dependent migration to the site of inflammation, where they will execute the encoded tasks such as lipopolysaccharide elimination and scavenging of danger-associated molecular patterns. Human induced pluripotent stem cells (iPSCs) derived 3D human lung organoid (LO) model will be used to confirm effectivity of nanorobot treatment in tissue-like structure. In the context of the final use of nanorobots for clinical practice, the pig model of pneumonia caused by Actinobacillus pleuropneumoniae will be used to verify the nanorobot therapy efficacy and safety.

A comprehensive in vitro, ex vivo and in vivo experimental study of an osteoinductive phosphate adhesive intended for the bonding of bone fractures and the performance of arthrodesis
Investigator at the VRI: MVDr. Edita JEKLOVÁ, Ph.D.

The aging of the European population is associated with an increased incidence of bone fractures. As a result of osteoporosis, the estimated number of fractures will further increase by 25% to 4.5 million by 2025. In addition, fractures and bone defects are also one of the most common causes of disability among workers. Therefore, effective management of fractures is of significant socio-economic and public health importance. All forms of treatment for broken bones follow one basic rule: broken fragments must be placed back where they belong and prevented from moving from that location until they have healed. However, there are small fragments, which cannot be fixed by conventional methods. The question is: „Is it possible to use injectable resorbable bone glue to compose small bone fragments together, which after hardening in combination with internal fixation will allow immediate weight-bearing of the injured extremity?" The project hypothesis is to inject newly developed resorbable non-exothermic "self-setting" bone adhesive in the form of free-flowing paste into a comminuted fracture in order to compose small bone fragments together like a puzzle and in combination with osteosynthesis will allow full weight-bearing of the injured extremity. The bioadhesive-modified bone glue fixes the fracture during solidification under physiological conditions, is slowly absorbed and at the same time releases calcium phosphate products, thus initiating primary bone healing, at the end of which the adhesive is completely resorbed, the bone is firmly healed without intra-articular deficits and the patient is ready for immediate rehabilitation. This bone adhesive can be used not only for the treatment of fractures but due to its properties it can also be used in arthrodesis or to fill bone cysts. However, a necessary intermediate step to possible clinical testing is in vitro, ex vivo, and in vivo experimental study.

A new generation of milk drinks and their alternatives with a controlled start of fermentation
Investigator at the VRI: MVDr. Kateřina NEDBALCOVÁ, Ph.D.

The outcome of the project will be completely unique functional fermented beverages using a system of modified probiotic cultures, which have a positive effect on health. The product will consist of milk (or a plant-based milk alternative) and a part consisting of modified probiotic cultures. The two components will be separated and, when used, the probiotics will be aseptically incorporated into the milk component (or milk alternative, as appropriate) by simple manipulation, thus starting the fermentation process.

Development of a safe preparation for the suppression of endotoxemia in patients undergoing chemotherapy treatment
Investigator at the VRI: MVDr. Ján MATIAŠOVIC, Ph.D.

The project aims to develop a new probiotic food supplement, which will be based on a unique processing technology of stabilized probiotic cultures, which will be able to preserve the positive effect of probiotic bacteria, but at the same time eliminate the risk of sepsis that probiotics can cause in immunosuppressed oncology patients during chemotherapy and radiotherapy. The aim of the project is to develop a new completely safe probiotic preparation based on probiotic microbial lysates, designed to alleviate the diarrheal and dysmicrobial burden of oncology patients, including severe endotoxemia, during chemotherapy or radiotherapy. The metabolites obtained from disturbed probiotic cells ensure a completely safe regenerative and protective process on the intestinal mucosa without the risk of sepsis that could be caused by live probiotic bacteria. A significant positive effect on reducing intestinal mucosal permeability and enhancing its regeneration has already been demonstrated in preliminary tests conducted at the Veterinary Research Institute (VRI).

Innovative products based on active substances from hemp with high bioavalability for topical application with a local effect
Investigator at the VRI: PharmDr. Josef MAŠEK, Ph.D

The aim of the project is to develop an innovative product with high added value thanks to the proven increased bioavailability of active ingredients - their effective penetration into the skin structures and a potentially unique combination of active ingredients and the so-called self-emulsifying nanodelivery system. Given the high export potential of the developed products, the implementation of the proposed project will contribute to increasing the international competitiveness of the company.

The impact of polycyclic aromatic hydrocarbons on cellular processes linked with stress signalling and deregulation of metabolism
Investigator at the VRI: RNDr. Miroslav MACHALA, CSc.

GAČR
GRANTOVÁ AGENTURA ČESKÉ REPUBLIKY

Polycyclic aromatic hydrocarbons (PAHs) associated with airborne particulate pollution are an important group of environmental pollutants that are primarily studied as potential carcinogens. Recent studies indicate that spectrum of their toxic actions is much wider, including the effects leading to endocrine and metabolic disruption. The project aims to evaluate the mechanism of toxic action of PAHs, efficient ligands of the aryl hydrocarbon receptor (AhR), that are linked with activation of stress signalling pathways underlying responses of cells towards oxidative stress, endoplasmic reticulum stress and mitochondrial disruption, leading to activation of integrated stress response, deregulation of cell metabolism and production of stress cytokines. Using in vitro models of human liver cells, we will analyse in detail functional roles of the AhR, PAH metabolism, and additional transcriptional regulators linked with stress signalling in these processes. The project is expected to bring novel information for toxicity evaluation of PAHs, which belong among key toxic airborne contaminants.

Other providers of projects implemented in 2024

MINISTERSTVO VNITRA ČESKÉ REPUBLIKY

MINISTERSTVO ŠKOLSTVÍ, MLÁDEŽE A TĚLOVÝCHOVY

PROGRAM ROZVOJE VENKOVA

Zemědělský svaz České republiky

PROGRAM 9 F.i. Professional Consultations
Investigator at the VRI: Doc. MVDr. Soňa ŠLOSÁRKOVÁ, Ph.D.

In 2024, the VRI continued to provide consultancy services for agricultural production under the 9.F.i. Support for Agriculture Consulting, Expert Consultations, financially supported by the Ministry of Agriculture of the Czech Republic.
The VRI staff reported 176.41 consultation hours for the entire year 2024 under this project (as revised by the Ministry of Agriculture of the Czech Republic), predominantly for dairy cattle breeders, and to a lesser extent for pig, poultry, sheep, and goat breeders. Accordingly, the VRI was paid a total sum of CZK 211,692 in two phases (July and December 2024). After deducting the funds allocated to the Institute's overhead from the received subsidy, the respective staff members were paid bonuses in their salary in two instalments according to their reported consulting hours.

NATIONAL CENTRE FOR BIOTECHNOLOGY IN VETERINARY MEDICINE

ABOUT THE PROJECT

The National Centre for Biotechnology in Veterinary Medicine (NaCeBiVet) is an interdisciplinary virtual research platform primarily aimed at addressing current challenges in sustainable animal production, food safety, and animal welfare. The project is implemented through coordinated collaboration between seven research institutions and nineteen industry partners, ensuring a direct link between research and the practical application of results in agriculture, food production, and veterinary medicine.

NaCeBiVet is structured into four main research pillars: biotechnology in prevention and therapy, diagnostics, nutrition, and reproduction. A unifying element across all activities is the emphasis on genetic and reproductive aspects, which form a key cross-cutting topic in the centre's research strategy. The project also focuses on innovations in reproductive biotechnology, diagnostics of genetic abnormalities, and monitoring of molecular markers related to fertility, disease resistance, and metabolic parameters.

NaCeBiVet thus brings modern solutions to the field of animal biotechnology, reflecting the demand for reduced antibiotic use, biodiversity preservation, improved animal living conditions, and the implementation of circular economy principles. The resulting innovations have the potential to strengthen the competitiveness of participating enterprises and to support the long-term sustainable development of animal production and veterinary care.

PARTNERS: CONSORTIUM OF 26 PARTNERS

The project is funded by the Technology Agency of the Czech Republic.

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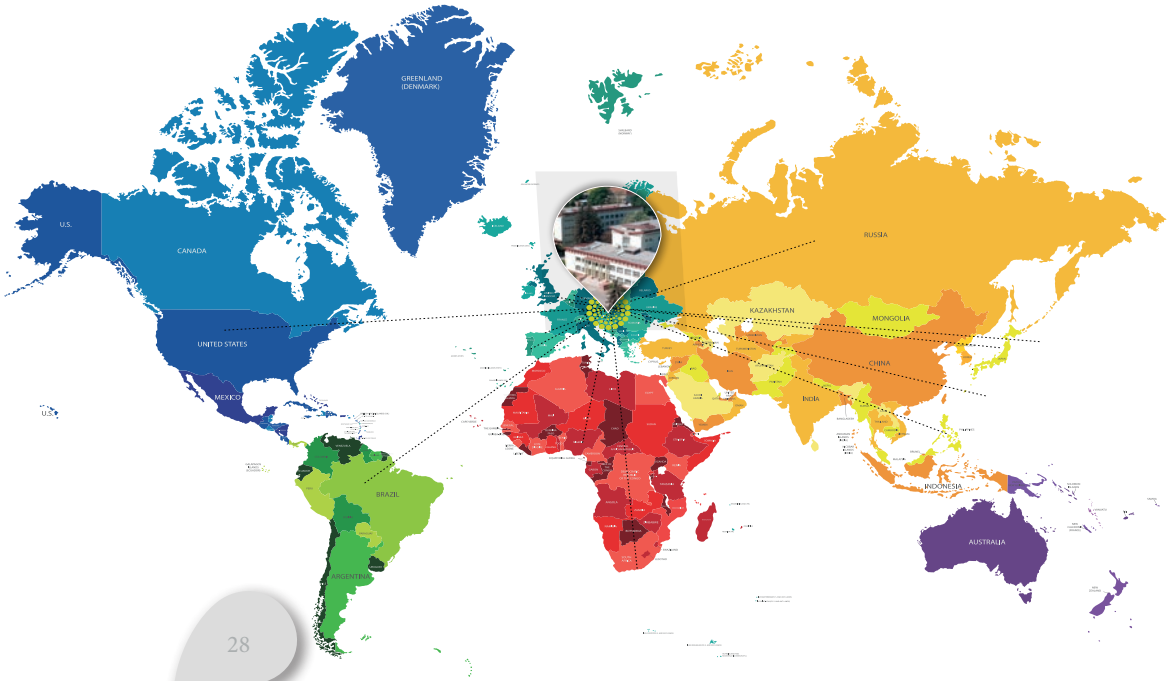
International Cooperation

In 2024, VRI maintained a high standard of international scientific research cooperation, built on an extensive network of contacts and partnerships between its researchers and leading foreign institutions. International cooperation took place through contractual research with foreign companies as well as through collaborative research with universities and research organizations within European and bilateral programmes. These activities were supported by tangible outcomes in the form of joint projects, scientific publications, patents, and signed agreements— in 2024, eight new framework cooperation agreements were concluded.

The Institute continued its participation in three international projects under the HORIZON Europe programme and actively prepared proposals for new calls within the new work programme for 2025–2027. In 2024, a project funded by the Norway Grants, which VRI coordinated, was successfully completed. A significant milestone was the launch of cooperation with the International Atomic Energy Agency (IAEA) in the field of antimicrobial resistance research. This cooperation represents an important step towards the Institute's global engagement in addressing current issues in animal and public health. VRI also continued its active involvement in the European platform Circular Bio-based Europe (CBE JU), following up on its previous participation in the Bio-Based Industries (BBI) initiative, with the aim of supporting research and development in the bioeconomy. International mobility remains an important pillar of cooperation – in 2024, several work and study stays of our researchers took place at partner institutions both within and outside the EU, as well as the hosting of colleagues from foreign research centres at VRI. The active participation of our scientists in international professional committees and consortia contributes to raising VRI's profile on the European research scene and creates conditions for the further growth of excellent collaboration.



ALEHOOP Project Achieves Innovative Advances in Research of Proteins from Seaweed and Legumes

After four years of specialized research and development, the ALEHOOP project has reached significant milestones in the innovation of sustainable proteins.
The goal of the ALEHOOP project (Biorefineries for the valorisation of macroalgal residual biomass and legume processing by-products) is to innovate the production of low-cost alternative proteins for use as high-value food supplements and animal feed.
This project is crucial for meeting the market demand for sustainable proteins while also reducing Europe's dependence on traditional plant-based proteins such as soy. VRI plays a key role in the ALEHOOP project by contributing to the design and validation of new protein-based feed ingredients derived from macroalgae, developed within the project. Its task is to demonstrate their applicability in novel feed formulations by testing them on target animal species—pigs and broilers.

Delegation from Uzbekistan Visits Veterinary Research Institute

On 4 December, a delegation of farmers and veterinarians from Uzbekistan visited the Veterinary Research Institute as part of a programme organized by the section dealing with foreign trade cooperation of the Ministry of Agriculture of the Czech Republic and the Embassy of the Czech Republic in Uzbekistan. This visit aimed to strengthen cooperation in agriculture, veterinary medicine, and research between the two countries.
The delegation became acquainted with the state-of-the-art methods and technologies in veterinary diagnostics and disease prevention for farm animals, particularly ruminants. Initially, the Director of the Institute, Dr. Faldyna, introduced the history and current directions of the Institute to the ten farmers and veterinarians. The programme included presentations by the Institute experts, who introduced current research projects with a focus on infectious diseases of cattle and antimicrobial resistance issues. Dr. Fleischer and Dr. Zouharová presented research and laboratory work in the field of bovine mastitis. During the tour of selected laboratories, the colleagues had the opportunity to see, for example, bacterial identification using MALDI-TOF mass spectrometry and the detection of chromosomal structure abnormalities in cattle.
During the visit, there was also a discussion about the possibilities for cooperation, particularly in technology transfer, expert training, and the sharing of scientific knowledge. The Uzbekistan colleagues acknowledged the high level of Czech veterinary research and expressed interest in further exchange of experiences.
This visit is another step towards strengthening international cooperation between the Czech Republic and Uzbekistan and underscores the importance of science and innovation in the development of sustainable agriculture and animal health care.

NEOGIANT: THE POWER OF GRAPE EXTRACTS: ANTIMICROBIAL AND ANTIOXIDANT PROPERTIES TO PREVENT THE USE OF ANTIBIOTICS IN FARMED ANIMALS

ABOUT THE PROJECT

The main objective of the NeoGiANT project is to develop and validate an innovative natural formulation from grape extracts with antimicrobial and antioxidant properties, which will be used as a nutritional supplement for farm animals and farmed fish. The aim is to reduce the dependence on the use of antibiotics in animal/aquaculture production. This strategy should make a significant contribution to the fight against antimicrobial resistance (AMR) originating in animal production on farms by providing an economically viable alternative to the routine use of antibiotics.

PARTNERS: CONSORTIUM OF 20 PARTNERS

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Horizon 2020
European Union Funding
for Research & Innovation

BIOREFINERIES FOR THE VALORISATION OF MACROALGAL RESIDUAL BIOMASS AND LEGUME PROCESSING BY-PRODUCTS TO OBTAIN NEW PROTEIN VALUE CHAINS FOR HIGH-VALUE FOOD AND FEED APPLICATIONS (ALEHOOP)

ABOUT THE PROJECT

Obtaining cheap dietary proteins from biomass, algae and by-products in the production of legumes using biorefineries. This transforms biomass into alternative forms of proteins for a variety of uses, from animal feeds and food supplements to cutting-edge applications in nutritional awareness and health control.

PARTNERS: CONSORTIUM OF 16 PARTNERS

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Horizon 2020
European Union Funding
for Research & Innovation

Bio-based Industries
Consortium

Iceland Liechtenstein Norway grants
Norway grants

TBFVnet - A NETWORK OF LABORATORIES THAT STUDY AND SURVEY TICK-BORNE FLAVIVIRUSES

ABOUT THE PROJECT

TBFVnet is a joint research platform consisting of a network of associated laboratories to investigate the biology and pathogenesis of tick-borne encephalitis virus (TBFV) disease and to study novel antivirals. TBFVnet also aims to integrate research in this area by sharing common tools, expertise and best practices, and passing them on to neighboring countries.

PARTNERS: CONSORTIUM OF 6 PARTNERS

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inno protein

INNOPROTEIN: NEW SUSTAINABLE PROTEINS FOR FOOD, FEED AND NON-FOOD BIO-BASED APPLICATIONS

ABOUT THE PROJECT

With the global population expected to reach 10 billion in 2050, the urgency of sustainably producing high-quality protein is evident. The protein deficit in the EU, with 70% of protein crops and 90% of soybeans being imported, highlights the growing need for fresh organic protein sources across various markets.

The InnoProtein project addresses this challenge by developing new products for food, feed, and other applications. By utilizing overlooked protein sources such as microalgae, fungi, bacteria, and insects, and combining them with advanced extraction techniques, we are working toward solutions that reduce protein scarcity in the EU while minimizing environmental impact.

PARTNERS: CONSORTIUM OF 15 PARTNERS

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Co-funded by the European Union

Transfer of Results to End-users

The system of commercialisation and knowledge transfer at the VRI is coordinated by the Centre for Technology Transfer and Project Support (CTTPS), whose aim is to ensure the maximum use of the employees' work results so that they bring the greatest possible benefit to the Institute. Although not every activity may generate profit, we always focus on positive environmental impacts and on benefits for society. The Institute is fully aware of the importance of these activities and actively seeks new solutions and approaches that meet these needs while introducing innovation. Key aspects include applied research, the quality and scope of partner networks, and the strengthening of collaboration with the academic sector. The main activities in this area include: monitoring research activities and new knowledge; evaluating the commercial potential of new knowledge; ensuring the protection of intellectual property for created items; managing the intellectual property portfolio; providing consultancy and ensuring contractual documents; preparing internal regulations; developing licensing policy and promoting results; offering consultations and analyses; and providing external legal services. As of December 31, 2024, the Institute holds a total of 14 valid national and international patents and 42 utility models, including 4 utility models registered in 2024. In collaboration with Palacký University in Olomouc, an international patent application (PCT) was filed in 2024 under the title „Coordination Compounds of Ruthenium and Osmium for Use in the Treatment of Lung Cancer", registered under the number PCT/CZ2024/050060. The international patent application, PCT/CZ2022/050128, concerning the use of ginsenosides for the treatment of chronic hepatitis B virus infection, entered the national phase of the European patent application process in 2024 under the number EP 22826050.1, in cooperation with Mendel University in Brno. One of the main objectives of technology and knowledge transfer in 2024 was to strengthen collaboration with the professional community and the application sphere in agriculture and veterinary medicine, as well as with potential customers of research results and knowledge. The Institute has initiated new projects focused on applied research, development, and expert activities, with the aim of creating long-term mutually beneficial relationships. One of the significant projects is the National Centre for Biotechnology in Veterinary Medicine (NaCeBiVet), which is intended to substantially strengthen collaboration with industry and accelerate technology transfer. The focus of research capacities on application and on linking research excellence with technological trends and innovative outcomes offers partner companies opportunities for their growth. Within the Centre, two thematic workshops were organized—one on advanced diagnostic methods in veterinary medicine and the other on new trends in reproduction in dairy cattle herds. The aim was to discuss the formulation of new ideas to support strategic decision-making and the development of joint research and innovation projects. Additionally, the workshops sought to identify barriers that slow down the transfer of research results obtained by collaboration between research organisations and the application sphere to end-users at various stages of the process, including legislative constraints. Advanced diagnostic methods in veterinary medicine. A major role in the transfer of new knowledge to end users is played by the educational project VRI Academy, which is implemented in collaboration with the Ministry of Agriculture of the Czech Republic, professional organisations and other partners (for more information see Section 5.5. Organization of professional events and https://www.vri.cz/spoluprace-s-praxi/vuvel-academy-a--ctpz/).

In 2024, in the area of commercialisation of research and development results, contracts for collaboration with domestic and foreign partners, especially from the industry, were concluded in the amount of approx. 15 mil. CZK. These collaborations were accomplished in the form of licencing agreements, contractual research and custom research agreements.

Certified methodologies

Title of the result	Authors
Active monitoring of pathogenic Escherichia coli clones in parent flocks, hatcheries, and commercial meat-producing poultry flocks	ČÍŽEK, Alois; PAPOUŠKOVÁ, Aneta; NEDBALCOVÁ, Kateřina; ŠENK, David
Proposal for the recommended treatment of broilers with amoxicillin in combination with clavulanic acid	FLEISCHER, Petr; ŠLOSÁRKOVÁ, Soňa; PECHOVÁ, Alena
Identification and quantification of selected antimicrobials by High-Resolution Liquid Chromatography–Mass Spectrometry in poultry farm environments	CHARVÁTOVÁ, Michaela; ŠŤASTNÝ, Kamil
Metabolomics – identification and quantification of nandrolone metabolites (norandrosterone and noretiocholanolone glucuronides) in pig urine using High-Resolution Liquid Chromatography–Mass Spectrometry	PÚTECOVÁ, Kristína; ŠŤASTNÝ, Kamil
Methodology for Evaluating the Quality of In Vitro-Produced Bovine Oocytes and Embryos Using Light and Fluorescence Microscopy	HORÁKOVÁ, Adéla; KONEČNÁ, Markéta; ANGER, Martin
Selective Drying off in Cows	PECHOVÁ, Alena; BORKOVEC, Libor; FLEISCHER, Petr; ŠLOSÁRKOVÁ, Soňa

Utility model

Title of the result	Authors
Bacterial product for hatchery environment sanitation	RYCHLÍK, Ivan; FALDYNOVÁ, Marcela; KARASOVÁ, Daniela; ŠEBKOVÁ, Alena; PŘIKRYLOVÁ, Hana; HAVLÍČKOVÁ, Hana
Instrument for performing intrafollicular oocyte transfer in cattle	ČECH, Svatopluk; KOS, Vojtěch; ŘIHÁČKOVÁ, Eva; KRUPICOVÁ, Jana
Probiotic product for the protection of the cecal mucosa in poultry	RYCHLÍK, Ivan; FALDYNOVÁ, Marcela; KARASOVÁ, Daniela; ŠEBKOVÁ, Alena; PŘIKRYLOVÁ, Hana; MATIAŠOVICOVÁ, Jitka; VOLF, Jiří; ČÍŽEK, Alois
Veterinary preparation for the prevention and/or treatment of mastitis in cattle	RYCHLÍK, Ivan; MATIAŠOVICOVÁ, Jitka; VOLF, Jiří

Verified technology

Title of the result	Authors
Veterinary product QuoCNA – probiotic blend for chickens	RYCHLÍK, Ivan; MATIAŠOVICOVÁ, Jitka ; VOLF, Jiří
Production of a kit for determining the susceptibility/resistance of standard and potentiated sulfonamides in poultry bacterial pathogens	NEDBALCOVÁ, Kateřina; ZOUHAROVÁ, Monika; MATIAŠKOVÁ, Katarína

Prototypes, functional patterns

Title of the result	Authors
Diagnostic kit for multiplex detection of swine pathogens using Real-Time PCR	RYCHLÍK, Ivan; MATIAŠOVICOVÁ, Jitka ; ŠEBKOVÁ, Alena
Diagnostic kit for the identification of new serotypes of *Streptococcus suis* using Multiplex PCR	KRÁLOVÁ, Natálie; LEGRÁDYOVÁ, Oľga; ZOUHAROVÁ, Monika; MATIAŠOVIC, Ján
Complete feed mixture for the final stage of pig fattening using insect meal as a high-quality protein source to replace soy protein	VENUSOVÁ, Jana; PICKA, Jan; KOVÁŘOVÁ, Radka; STRAKOVÁ, Petra; FALDYNA, Martin; JEŘÁBEK, Martin
Cosmetic paste containing CBD with high bioavailability	MAŠKOVÁ, Eliška a MAŠEK, Josef
Lyophilized probiotic mixture for newborn piglets	RYCHLÍK, Ivan; VOLF, Jiří; MATIAŠOVICOVÁ, Jitka
Multiplex PCR for the detection of *Bacillus thuringiensis* Serovar *israelensis*	KRZYŽÁNKOVÁ, Miroslava ; JUŘICOVÁ, Helena
Optimization of recombinant antigen expression to increase yield and testing of stability and specificity of these proteins for use in a commercial ELISA Kit	GEBAUER, Jan; TESAŘÍK, Radek; KRÁLOVÁ, Natálie; MATIAŠOVIC, Ján
Porphyrins as novel inactivating agents for the inactivation of enveloped viruses in vaccine production	EYER, Luděk; HOLOUBEK, Jiří; SALÁT, Jiří; BEDNÁŘ, Petr; RŮŽEK, Daniel; RENČIUK, Daniel

Incidental Institutional Activities

Veterinary Research Institute Participates in Days of Electron Microscopy in Brno, 18 to 24 March 2024

This year's theme was the villains of the microworld, which could be viewed not only in the shopping centre Vaňkovka, but also at the Small Art Gallery of the Veterinary Research Institute.
The exhibition showed various viruses, a tapeworm proglottid extracted from the intestine of a cat infected from a mouse, the head of a nematode removed form a horse's eye, and a filaria extracted from a woman's upper eyelid. On display were also colonies of Staphylococcus aureus on cling film, intestinal bacteria and dying porcine adipocytes. Additionally, noteworthy images featured microplastic beads and lesions on the trout gills they can cause despite their seemingly harmless appearance.
The images originate from the research activities at our Institute. Research conducted here spans various areas of animal and human health as there is only one health, which we share. Without healthy animals, there will be no healthy people!

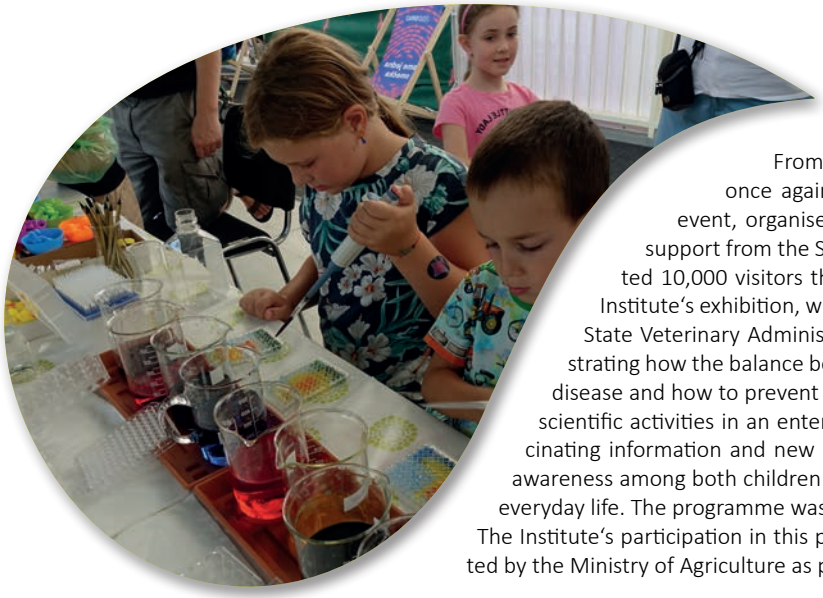
VRI Opens Its Doors Again at Open House Festival

Open House Brno is part of a Europe-wide project involving 14 cities, aimed at introducing the public to places that are notable for their architecture, mission, or approach to addressing social and environmental issues.
This year, the 7th edition of the festival took place on 18–19 May, and the Veterinary Research Institute participated for the third time.
After an introduction to the VRI history and its current mission by Director Dr. Faldyna, visitors had the opportunity to tour selected parts of the Institute, which was built between 1958 and 1963 based on a design by architect Vladimír Beneš. After entering the foyer of the administrative building, they proceeded to the Small Gallery of the Veterinary Research Institute, where Ing. Ondráčková from the IT Unit highlighted its tradition, historical context, and current activities. A significant part of the tour took place in the Institute's library, featuring a unique spiral staircase. The excursion also included a visit to the historic nuclear shelter and a view from the 4th floor of Building 3 over the surrounding area—towards the buildings of the Technology Park and CEITEC VUT on one side, and Medlánky and Řečkovice on the other.

May 2024 'Bike to Work' Challenge a Success

The Veterinary Research Institute participated once again—this time for the seventh year—in the challenge encouraging employees to cycle, scoot, or walk to work. This year, the participants were favoured by good weather. A total of 24 riders and walkers from our Institute took part, organized into six teams: PipiTeam, The Fishermen, Brakes and Cables, Brakes and Cables II, Institute Riders, and Dark Horses. Together, they covered an incredible 4,842 km on their way to work, with nearly 2,000 km walked. To put it in perspective, that distance is roughly equivalent, as the crow flies, to reaching countries such as Ghana, Yemen, or Pakistan. The team with the best participation was Institute Riders (100%), while PipiTeam covered the longest average distance (219 km). Special recognition goes to five female employees who maintained 100% consistency, using no cars or other forms of transport besides their own power throughout the month. Through their participation, the employees of the Veterinary Research Institute saved a total of 764.9 kg of CO_2 emissions, equivalent to the absorption capacity of 38 trees. Across the entire city of Brno, this would correspond to 5,000 trees, roughly equal to one hectare of forest. (Source: Auto*Mat z.s.)

The Veterinary Research Institute highly values participation in activities that help protect the environment and congratulates its teams on their results, which can also serve as motivation for others who have the opportunity to get to work without using fuel-powered transport.



VRI at the 2024 Science Festival

From 6 to 8 September 2024, the Veterinary Research Institute once again took part in the Festival of Science and Technology. The event, organised by the Brno Observatory and Planetarium with financial support from the Statutory City of Brno and the South Moravian Region, attracted 10,000 visitors this year. "Balance" was the main theme of the festival. The Institute's exhibition, which this year was complemented by a presentation from the State Veterinary Administration for the South Moravian Region, focused on demonstrating how the balance between health and disease is studied, who or what can cause disease and how to prevent it. Visitors had the opportunity to learn about the Institute's scientific activities in an entertaining way. Through interactive elements and quizzes, fascinating information and new insights from the world of science were presented to raise awareness among both children and adults about the importance of science and research in everyday life. The programme was suitable for all ages.

The Institute's participation in this popularisation and educational event was financially supported by the Ministry of Agriculture as part of the annual educational plan for public training.

VRI Scientists Demonstrate Transformation in Science at the Researchers' Night 2024

On Friday, 27 September 2024, laboratories across the country were illuminated for the national science popularisation event, "Researchers' Night". This year's theme „Transformation" offered a variety of possibilities. Scientists shared innovations in their activities with the public, with the VRI specifically focusing on changes in the microbiome and the impact of digestion on health and disease. There were also quizzes to test or supplement the audience's knowledge of natural science. The presentation took place at Mendel University in Brno. "Many wonderful children and adults visited us, and we discussed whatever interested them. Sometimes, the questions made us think hard, but everything took place in a pleasant atmosphere," said Dr. Crhánová. Together with Dr. Zalewska and Dr. Bernardy, she offered visitors a wealth of new knowledge and inspiring motivation to continue learning late into the evening.

The Institute's participation in this popularization and educational event was financially supported by the Ministry of Agriculture, thanks to the functional project under the Ministry of Agriculture's annual vocational education plan for public training.

Agriculture in Autumn and the VRI Children's Educational Camp

On 29-30 October 2024, we were pleased to host the third annual autumn camp for the children of our employees. This two-day event, organised with support from the Ministry of Agriculture, brought together 15 children for a varied and unforgettable programme filled with games and adventures. It gave our children the opportunity to experience autumn in a different way – actively, outdoors, and surrounded by nature – while getting a glimpse of their parents' work through fun activities.

The entire camp was imbued with the spirit of autumn colours and stories about life on the farm. The children had various hands-on activities awaiting them: from visiting a goat herd, where they could try the role of a little farmer, to an autumn walk in the protected nature area of Medlánecké Hills. The children had the opportunity to learn what it takes to care for animals and the soil, and to discover the preparations that the farm and nature require before winter. We created each moment to be not only educational but also fun and inspiring for them.

Our vision is for the children to gain a better understanding of agriculture and to remain connected to nature in the future. In addition to the educational trail titled "Agriculture is Alive!", we prepared creative activities – the children made their own autumn decorations, and at the end, they gathered for a fairy tale to relax after a busy day. The enthusiastic feedback shows that we offered them a holiday full of adventures, demonstrating that agriculture can be not only hard work but also a source of joy.

VRI Actively Engages in Helping Those in Need

People should help each other in times of need. Everyone knows that expression. Unfortunately, this year has given us another opportunity to truly test how we live up to this saying. And it must be said that the employees of the Veterinary Research Institute faced it head-on. When heavy rains caused severe flooding in the Czech Republic, particularly in northern Moravia, we didn't hesitate and filled our "box of help" with essential items – non-perishable food and cleaning supplies – which we sent to those in need through the Food Bank at the end of September.

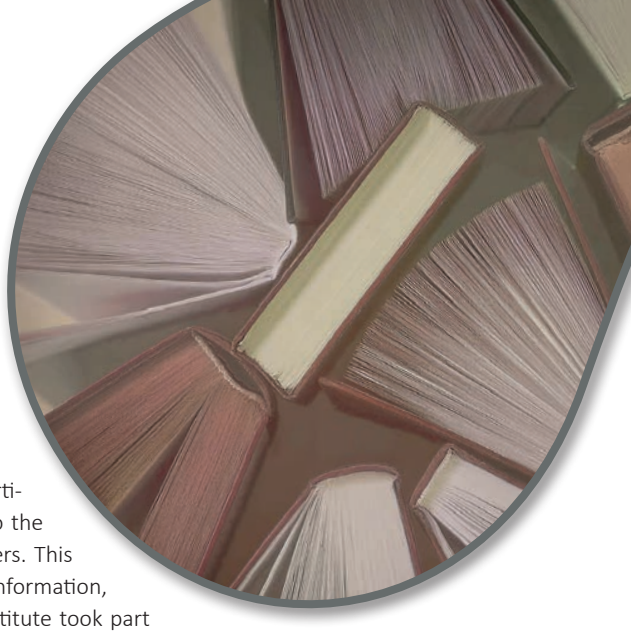
Another reason to show solidarity with those facing hardship is the approaching winter. Life on the streets is far from easy, so we organized another collection — now a tradition — called "Socks for the Homeless". As in previous years, the response exceeded the organizers' expectations, and we managed to fill a car for our partner, the charity in Brno, with numerous bags, handbags, boxes, packages, shoes, blankets, backpacks and more. We hope these contributions will make a difference!

Annual Employees' Day

On Friday, June 14, 2024, the annual gathering of employees of the Veterinary Research Institute and their family members took place. This year's event was held in the style of the popular fairy tale "Princes Are Useless" (Princové jsou na draka). The whole day was marked by a relaxed and friendly atmosphere, enhanced by creative decorations, themed costumes, and a varied supporting programme inspired by the fairy-tale world.

Participants enjoyed fun activities, informal interactions across departments, and opportunities to share experiences outside the daily work routine. The event helped strengthen team spirit and provided a delightful break in the working year.

Library



In 2024, the Library continuously updated its holdings, purchased books and periodicals based on staff requests, and provided bibliographic services, including book lending and providing papers published in journals from its own fund, as well as from other Czech libraries and from abroad. The aforementioned updates to the library's holdings involve acquiring titles in veterinary medicine and related fields such as zoology, biomedicine, immunology, and others. Besides that, it fulfilled Interlibrary loan (ILL) requests for other libraries in the Czech Republic. It also provided basic reprographic services (scanning, copying, etc.).

As well as in previous years, the online access to full-texts of requested papers in consortium databases offered by Elsevier (ScienceDirect and Scopus), Springer and Wiley and to the abstract and citation database Web of Science was made possible for the VRI researchers. This range of special resources supported VRI's researchers in accessing the latest studies and information, significantly contributing to their research efforts. Last year, the Veterinary Research Institute took part in the annual Open House event, offering the general public a tour of the library and the nuclear fallout shelter. Visitors had the opportunity to explore the library and learn more about its long history and operation.

In addition to professional literature, the VRI Library also provides lending of fiction books within the Employees' Library (https://knihovna.vri.cz/). The library's holdings are continually expanded with new and engaging titles in leisure reading and popular science.

In the future, the library plans to maintain these activities, continue expanding its holdings, and provide literature search and reprographic services to the Institute's scientific staff.

MG Malá galerie

In 2024, our Small Art Gallery hosted 8 exhibitions of photographs, graphic arts, woodcuts, paintings, etc. Some artists organized private viewing to their exhibitions.

- **Alena Borková – Iceland – An island jewel through the eyes of a romantic, photographs**
- **Electron Microscopy Days – Exhibition of microcosm villains, photographs**
- **Rastislav Adamko – Fragments from my life, drawings and paintings**
- **Martina Trchová – B as in Babi and Baba Bedla, book illustrations**
- **Luděk Eyer and Jana Špačková – Landscape and Bouquets, oil painting and watercolour**
- **studio Andaluz – Flamenco, photographs**
- **Ján Lastomírsky – Conversations about the Universe, book illustrations**
- **Klára Šiška and Veronika Malyjurková – Stories of the Landscape, watercolours**

Sisters MgA. Sylva Tománková and Andrea Ďurišová are responsible for the Small Art Gallery operation. For the history of exhibitions and current exhibitions please visit **https://www.vri.cz/spoluprace-s-praxi/mala-galerie/**

Additional Activities

Veterinary Committee for Food Safety in 2024

Veterinary Committee for Food Safety in 2024
In 2024, the Veterinary Committee for Food Safety, supported organizationally by the VRI, operated with the following members:
Chairperson of the Committee:
RNDr. Miroslav Machala, CSc. (VRI)
Secretary of the Committee:
Mgr. Soňa Marvanová, Ph.D. (VRI)

Members:
MVDr. Pavel Alexa, CSc. (VRI, former employee)
Doc. MVDr. Jan Bardoň, Ph.D. (SVI Olomouc)
Prof. Ing. Petr Doležal, CSc. (MENDELU)
Prof. MVDr. Alfréd Hera, CSc. (ISCVBM Brno),
MVDr. Václav Jordán (Agris Medlov, former employee)
Doc. MVDr. Renáta Karpíšková, Ph.D. (LF MU)
MVDr. Ivana Koláčková, Ph.D. (LF MU)
MVDr. Eva Renčová, Ph.D. (ISCVBM Brno)
Prof. RNDr. Daniel Růžek, Ph.D. (MUNI SCI)
Mgr. Petra Vašíčková, Ph.D. (LF MU)
Prof. MVDr. Vladimír Večerek, CSc. (VETUNI Brno)
Prof. MVDr. Lenka Vorlová, Ph.D. (VETUNI Brno)
Professional activity of the Committee in 2024 focused mainly on processing and discussion of four studies closely related to current issues in veterinary medicine and food and feed safety:

1) Biological evaluation of karanjin – antimicrobial efficacy and toxicity
(Doc. Suchý et al.)
2) Population structure and antimicrobial resistance in L. monocytogenes strains isolated from animals, humans, food, and the environment
(Doc. Karpíšková et al.)
3) Antimicrobial resistance in ready-to-eat foods
(Dr. Koláčková et al.)
4) Use of an inhibitor's effect for detecting honey adulteration with foreign α-amylase
(Prof. Vorlová et al.)
The Chairperson and members of the Committee monitored the current risks and scientific opinions related to veterinary medicine and food safety (EFSA studies, EU pharmacological legislation, etc.). The Chairperson of the Veterinary Committee for Food Safety participated in a regular meeting of the EREN (Emerging Risks Exchange Network) panel organized by the European Food Safety Authority (EFSA).

Collection of Animal Pathogenic Microorganisms (CAPM)

- **Deposition of:**
  - New bacterial and viral isolates into the CAPM
  - Cultures of microorganisms for the purposes of patent procedures in the Czech Republic
  - Storage in safe deposit (cultures remain the property of the depositor)
- **Areas of advisory services**
  - Taxonomy of bacteria and viruses
  - Growing bacterial cultures
  - Isolation and growth of viruses in cell cultures and chicken embryos
  - Detection of mycoplasma contamination in viral and cell cultures and its elimination
  - Cryopreservation of bacteria, viruses and cell cultures
  - Biosafety and biosecurity
- **Distribution of cultures of animal pathogenic bacteria and viruses**
  - Database of available strains is accessible through the Internet at http:/ /www.vurv.cz/ collections/vurv.exe/ search?lang=cz
- **Lyophilisation services**

Head: MVDr. Markéta Reichelová, Contact: Phone: +420 5 33332131, E-mail: marketa.reichelova@vri.cz

Centre of Laboratories- Testing laboratory No. 1354

Accredited entity according to ČSN EN ISO/IEC 17025:2005

01- Laboratory for Animal Health and Food Safety

Detection of human noroviruses, hepatitis A and E viruses, and SARS-CoV-2 by real-time RT-PCR.

02- Laboratory for Fish Viral Diseases

Processing of fish tissues for virological examination and isolation of viruses pathogenic to fish on cell lines

Detection of selected sections of DNA and RNA sequences in fish viruses by PCR method

Detection of selected sections of DNA and RNA sequences of fish viruses by real time PCR method

03- Laboratory for Spermatology and Andrology

Laboratory examination of sperm; determination of the functions of male reproductive organs; biological safety testing of various materials for sperm

04- Laboratory for Bovine Diseases

Bovine Viral Diarrhoea (BVD) – detection of antibodies by ELISA method

Infectious Bovine Rhinotracheitis (IBR) – detection of antibodies by ELISA method – method available since 20 December 2022.

Paratuberculosis – detection of antibodies by ELISA method

Detection of the causative agent of paratuberculosis (PTB) using quantitative PCR

05- Laboratory for Electron Microscopy

Diagnostics of viruses by negative staining method

Human Resource Management in Research – HR Award

Commitment to Excellence in Human Resources

Since 2022, the Veterinary Research Institute has proudly held the prestigious HR Excellence in Research award, which confirms our commitment to transparent and effective human resource management. In line with the principles of the Code and the Charter for Researchers, as well as our internal regulations, we actively promote equal opportunity policies and create a work environment where respect and mutual support are core values.

We are vigilant to ensure that no form of discrimination, sexual harassment, or any other inappropriate behaviour that could undermine healthy interpersonal relationships is tolerated in our workplace. Our goal is to maintain a positive work environment where every employee feels respected, recognized, and supported in their professional and personal development.

Implementation of the HR Award Action Plan

In 2024, we continued implementing the HR Award action plan, which brought a more systematic approach to human resource management. The key areas we focused on included:

Building a strong reputation and enhancing the social responsibility of our institution,

Supporting teamwork, engagement, and a sense of belonging through formal and informal meetings,

Supporting programmes for employees' children and assisting those facing difficult life situations, as well as promoting equal opportunities as a means of preventing discrimination,

The activities carried out were not random; they were carefully planned and based on best practices and experiences gained in previous years. It is important to emphasize that the successful implementation of these activities was largely thanks to the active involvement and support of our employees, whose approach helped create a welcoming atmosphere and build upon previous good cooperation in areas we recognize as important.

A New Project for the Sustainable Development of the Research Environment

In the second half of 2024, we completed the preparation of the significant project "Development of a Sustainable Environment for Veterinary Research at VR which was submitted within the framework of the OPJAK Research Environment call (No. 02_23_026).

The project addresses the current needs of VRI in the area of scientific research activities, with its main goal being the support of the research environment and the development of human resources in science and research, including the next phase of implementing strategic management within the Institute.

Support for this project will substantially help us in:

- Strengthening the managerial and research competencies of key employees.
- Introducing new tools to improve working conditions and career development for scientific staff.
- Increasing the efficiency of project management, with an emphasis on intellectual property protection and the principles of open science.
- Enhancing popularisation activities aimed at the public.

The submitted project represents a comprehensive approach to strengthening research activities at VRI. We believe that if the submitted project receives support, it will lead to a significant advancement in the support of managerial competencies and development of human resources in our research institution and targeted strengthening of research activities, ensuring our continued competitiveness at both national and international levels. We anticipate that the project will receive support and be approved for implementation in the first half of 2025.

Identifying Data

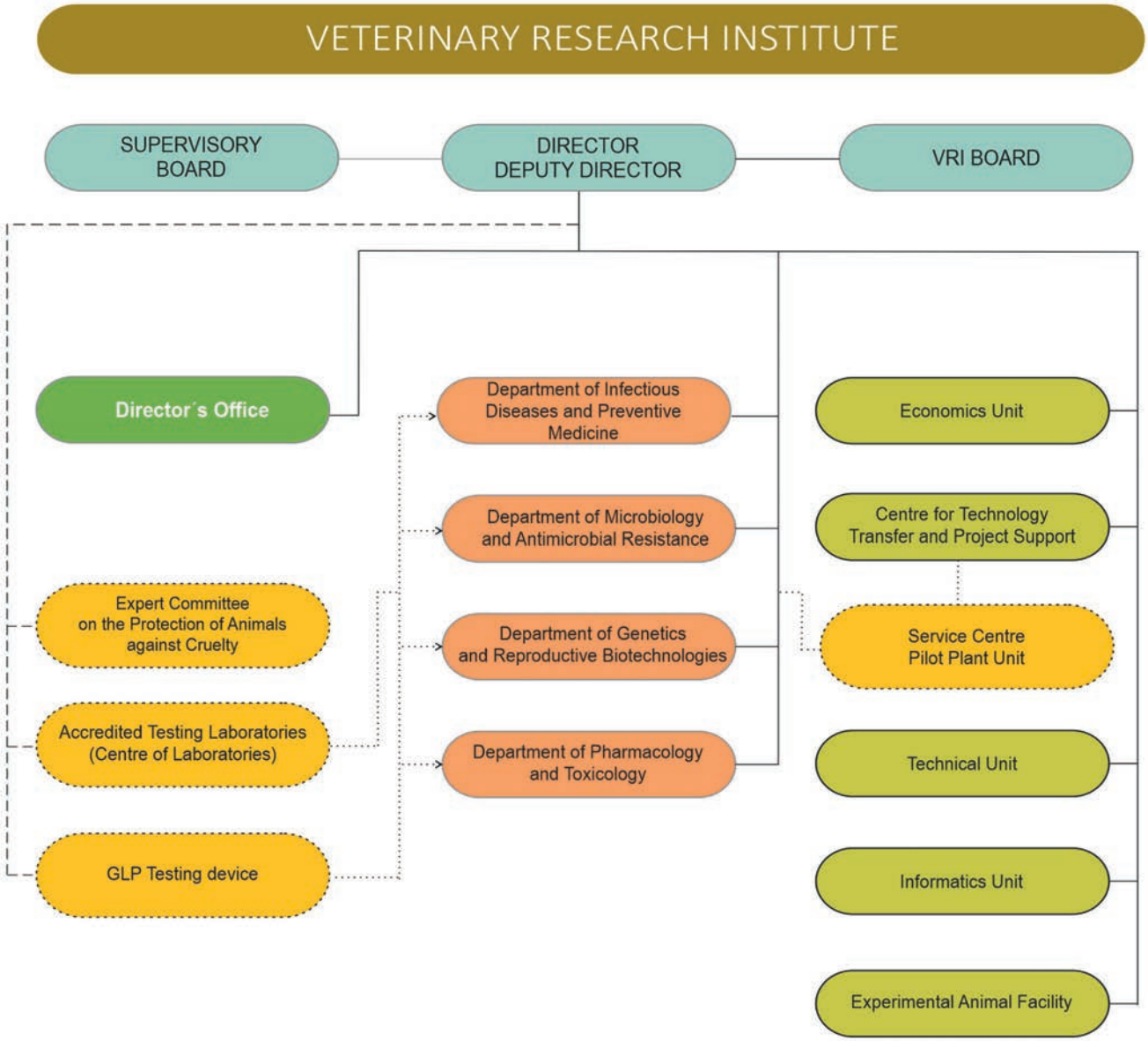
Identification No.: 00027162
Tax Identification No.:
CZ00027162
Address:
Hudcova 296/70
621 00 Brno
Czech Republic
Phone: + 420 533 331 111
Fax: +420 541 211 229
E-mail: vri@vri.cz
http://www.vri.cz
ID Data Mailbox: 3gsnh8r

Founder:
Ministry of Agriculture of the Czech Republic
Based in: Těšnov 17
117 05 Praha 1
Identification No.: 00020478

The Veterinary Research Institute location on the map
GPS Loc: 49°23728"N, 16°57948"E

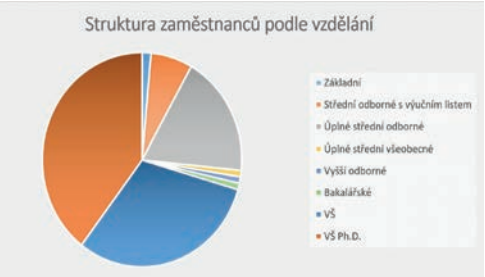
The Institute was founded on the basis of the Deed of Establishment Ref. No.: 22970/2006 - 11000, in accordance with § 3 of Act No. 341/2005 Coll., on public research institutions. The Veterinary Research Institute has become a public research institution with effect from 1 January 2007.

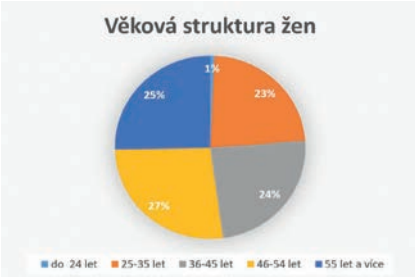
From the Deed of Establishment of the Veterinary Research Institute, as of 8 February 2018. The register of public research institutions: http://rvvi.msmt.cz/detail.php?ic=00027162


VETERINARY RESEARCH INSTITUTE
SUPERVISORY BOARD
DIRECTOR DEPUTY DIRECTOR
VRI BOARD
Director´s Office
Expert Committee on the Protection of Animals against Cruelty
Accredited Testing Laboratories (Centre of Laboratories)
GLP Testing device
Department of Infectious Diseases and Preventive Medicine
Department of Microbiology and Antimicrobial Resistance
Department of Genetics and Reproductive Biotechnologies
Department of Pharmacology and Toxicology
Economics Unit
Centre for Technology Transfer and Project Support
Service Centre Pilot Plant Unit
Technical Unit
Informatics Unit
Experimental Animal Facility

Basic personnel data

The average gross monthly salary of VRI employees in 2024 was CZK 44,653. When compared with the previous year, this represents a decrease of CZK 2,100 per month, which means that its year-over-year decrease was 4.49%. The national average for 2024, published on the Czech Republic's Statistical Office's website on 6th March, 2025, was CZK 46,165.





Long-term Conceptual Research Organization Development for 2023 – 2027

Decision number: MZE-RO 0523
Investigator: MVDr. Martin Faldyna, Ph.D.
The year 2024 marked the second year of the project supported from the VRI's finances entitled "Long-term Conceptual Research Organization Development for 2023 – 2027" (LTCROD). The LTCROD project builds on the period during which activities of the OP RDE projects were carried out. In preparing the LTCROD plan, consideration was also given to the documents of the Ministry of Agriculture's Concept of Research, Development and Innovation for 2023-2032, and the Strategy of the Ministry of Agriculture of the Czech Republic with an Outlook to 2030.
The internal structure of the LTCROD project reflects the professional focus of the Veterinary Research Institute as a research organization of the Ministry of Agriculture. The internal structure also reflects the organizational structure of the scientific part of the Institute. Thus, specific activities within the LTCROD were carried out through the implementation of 7 project plans that covered the whole range of topics in which the VRI is professionally involved: (1) Infectious diseases, (2) Immunology and preventive medicine, (3) Diagnostics, antimicrobials, and probiotics, (4) Genetics and reproduction of farm animals, (5) Experimental and pharmacological toxicology, and (6) Modern dosage forms and pharmacology. The latter research project focused on completing the activities related to the National Sustainability Programme. After the second year of the LTCROD project implementation, all the set indicators have been met and in most cases exceeded. For example, the Institute's staff were authors or co-authors of 70 publications in journals with impact factors above the median of the branches. In fact, this exceeds the planned number by 16. Other publication outcomes were 41, which is more than double the planned 18. The count of applied results reached 35, surpassing the planned quantity by 23. These figures demonstrate that the funds allocated for the institutional support of the Veterinary Research Institute were used effectively in alignment with their intended purpose.

SUBJECT OF THE MAIN ACTIVITIES

Basic and applied research and development in veterinary medicine, veterinary hygiene and ecology and related biomedical, agricultural and food sciences:

- Involvement in international and national centres of research and development,
- Activities of reference laboratories,
- Operation of the Collection of Animal Pathogenic Microorganisms,
- Scientific, professional and educational cooperation,
- Transfer of research and development results, including new technologies, to end users,
- Verification and dissemination of research results within the Institute's authority,
- Hosting and holding of professional courses, seminars, and conferences, workshops and other professional events,
- Function of an information centre and support of publishing in the field of veterinary medicine and food safety,
- Experimentation,
- Agricultural activities.

OTHER ACTIVITIES

Other activities relate to the major activities in the fields of veterinary medicine, veterinary hygiene and ecology and related biomedical, agricultural and food sciences:

1. Activities under the National Programme of Conservation and use of genetic resources of plants, animals and microorganisms important for nutrition and agriculture in conformity with Act No. 148/2003 Coll., on conservation and use of genetic resources of plants and microorganisms important for nutrition and agriculture and on amending Act No. 368/1992 Coll., on administrative fees, as amended (Act on Genetic Resources of Plants and Microorganisms).
2. Activity of the Veterinary Committee for Food Safety on the basis of the Resolution of the Government of the CR No. 1320 of 10 December 2001 concerning food safety strategy in the Czech Republic.
3. Expert witness activities in the fields of healthcare and agriculture; zoonotic diseases and infections of farm animals.
4. Commercial, financial, organizational and economic consulting.
5. Holding of professional courses, training and other educational activities, including lecturing activities.
6. Providing software and consultancy in hardware and software.
7. Graphics and drawing services.
8. Publishing services.

COMPLEMENTARY ACTIVITIES

FREE TRADES:

1. Activities of business, finance, organization and economic consultants
2. Research and development in sciences, technology and social sciences
3. Providing software, and consultancy in hardware and software
4. Copying services
5. Graphic art services
6. Specialized retail-sale and mixed goods
7. Hosting professional courses, trainings and other education, including lecturing
8. Publishing
9. Production of food products
10. Accommodation services

NON-TRADE ACTIVITIES

1. Letting real estate, apartments and non-residential rooms. (Besides letting out, no other services are provided by the lessor than basic services ensuring proper operation of the real estate, apartments and non-residential rooms.)
2. Agricultural production, provision of works and services in agriculture, production and sale of animals and animal and vegetable products.
3. Expert witness activities in the fields of healthcare and agriculture – zoonotic diseases and infections of farm animals.

EXPERIMENTAL ACTIVITIES

Experiments with the use of live animal models are carried out on the basis of accreditation (5050/2020-MZE-18134, valid until 23 March 2025). The goal is to create best conditions for experiments of the highest quality, corresponding to international standards with applying high ethical principles. Consideration is given to reducing the number of experimental animals used in approved experiments. All animal experiments are carried out according to the approved methodological procedure of the ordering party.

The following animals are used in the experiments: cattle, sheep, goats, pigs, rabbits, chickens, guinea pigs, rats, hamsters, mice and fish. In 2024, 43 experimental project proposals were submitted for approval in the following areas: basic research (765 animals), translational and applied research (1,218 animals), development, production or quality testing of the efficacy or safety of medicines, food, feed and other substances or products, as well as in the field of higher education or doctoral study in order to obtain, maintain or improve professional knowledge (273 animals). The following numbers of experimental animals were used in these experiments:

The following numbers of experimental animals were used in these experiments: 795 mice, 48 rats, 52 guinea pigs, 54 rabbits, 902 chickens, 219 pigs, 16 sheep, and 170 salmonid fish. The experiments were conducted under projects funded by the Technology Agency of the Czech Republic (TACR), Czech Science Foundation (GACR), ICVZ, National Agency for Agricultural Research (NAZV), Czech Health Research Council (AZV), NeoGIANT, basic research, contractual research of the Joint research workplace of the VRI and FNUSA-ICRC, as well as through commercial cooperation.

AGRICULTURAL ACTIVITIES

Part of the VRI agricultural area is designed for farm animal evacuation in case of fire or other emergency events. Such a designated fenced area with a tethering point for large farm animals, located away from the site of a potential accident is inevitable and conforms to the current legislation.

THE VRI AUTHORITIES

Statutory representative of the VRI: **MVDr. Martin Faldyna, Ph.D.**

DIRECTOR'S BOARD

Member's name	Department
MVDr. Ján Matiašovic, Ph.D.	Department of Infectious Diseases and Preventive Medicine
Doc. RNDr. Ivan Rychlík, Ph.D. (until 30 November 2024), Mgr. Magdaléna Crhánová, Ph.D. (from 1 December 2024)	Department of Microbiology and Antimicrobial Rezistance
Doc. MVDr. Martin Anger, CSc.	Department of Genetics and Reproductive Biotechnologies
PharmDr. Josef Mašek, Ph.D.	Department of Pharmacology and Toxicology

Member's name	Unit
Ing. Ildikó Csölle Putzová, Ph.D., MBA	Centre for Technology Transfer and Project Support
Roman Dvořáček	Informatics Unit
Mgr. František Pernica	Economics Unit
Marie Sobotková	Experimental Animal Facility
Ing. Jiří Svoboda	Technical Unit
IIng. Iva Stránská (until 31 January 2024) BOZP Servis s.r.o., Ing. Josef Nováček (from 22 April 2024)	Safety Officer
Ing. Jan Rázek Pavla Dobrovská	Director´s Office
Jana Křížová	HR Officer
Ing. Jiří Kolísek	HR Coordinator
Irena Smrčková, MSc.	Internal Auditor
MVDr. Kateřina Nedbalcová, Ph.D.	Veterinary Trade Union

MEMBERS OF THE SUPERVISORY BOARD

Member's name	Function	Organisation
Doc. MVDr. Milan Malena, Ph.D.	Chairperson	(29 July 2019 – 29 July 2024)
Ing. Štěpán Kala, MBA, Ph.D.	Chairperson	Institute of Agricultural Economics and Information (30 July 2024 – 30 July 2029)
Mgr. Tomáš Jírů	Deputy-Chair-person	Veterinary Administration for Pardubice Region (28 May 2019 – 28 May 2024)
Doc. Dr. Ing. Josef Kučera	Deputy-Chair-person	Czech-Moravian Breeders Corporation (29 May 2024 – 29 May 2029)
Mgr. Jaroslav Hejátko	Member	Ministry of Agriculture (1 May 2019 – 1 May 2024)
Mgr. Jakub Švorba	Member	Ministry of Agriculture (2 May 2024 – 2 May 2029)
Ing. Ondřej Sirko	Member	Ministry of Agriculture (27 May 2021 – 27 May 2026) resigned effective 31 August 2024)
MVDr. Martin Beňka	Member	State Veterinary Administration (7 December 2017 – 7 December 2022)
Ing. Jan Vodička	Member	Ministry of Agriculture (6 September 2024 – 6 September 2029)
Prof. MVDr. Alfred Hera, CSc.	Member	State Control of Veterinary Biologicals and Medicines (13 November 2020 – 13 November 2025)

THE VRI BOARD

Member's name	Function	Organisation
RNDr. Jana Prodělalová, Ph.D.	Chairperson	VRI
MVDr. Ján Matiašovic, Ph.D.	Deputy-Chairperson	VRI
MVDr. Martin Faldyna, Ph.D.	Member	VRI
MVDr. Kamil Kovarčík, Ph.D.	Member	VRI
PharmDr. Josef Mašek, Ph.D.	Member	VRI
MVDr. Ján Matiašovic, Ph.D.	Member	VRI
MVDr. Kateřina Nedbalcová, Ph.D.	Member	VRI
Doc. MVDr. Adam Novobilský, Ph.D.	Member	VRI
MVDr. Ľubomír Pojezdal, Ph.D.	Member	VRI
MVDr. Markéta Reichelová	Member	VRI
Mgr. Magdaléna Crhánová, Ph.D.	Member	VRI
MVDr. Jiří Bureš	External member	State Control of Veterinary
Doc. Dr. Ing. Josef Kučera (until 8 April 2024)	External member	Czech-Moravian Breeders Association, a.s., PGRLF
MVDr. Jana Kozáková, Ph.D. (from 3 June 2024)	External member	Regional Veterinary Administration of the State Veterinary Administration for South Moravian Region
Prof. MVDr. Vladimír Celer, Ph.D.	External member	University of Veterinary Sciences Brno
MVDr. Kamil Sedlák, Ph.D.	External member	State Veterinary Institute, Prague
Doc Ing. Pavel Ryant, Ph.D.	External member	Mendel University in Brno

THE ACTIVITIES OF THE VRI BOARD IN 2024

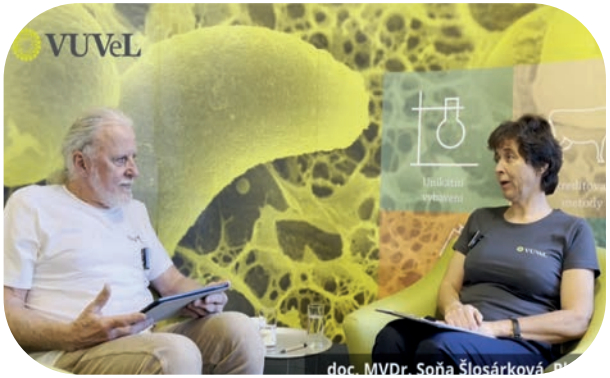
In 2024, three regular meetings of the VRI Board were held. The meetings included formal acts related to the running of the institution: The VRI Board members discussed the Institute's budget and the Annual Report of the Institute. The Board members also discussed and approved updates to the Election Rules of the VRI Board, the Rules of Procedure of the VRI Board, and the Organisation System of the VRI. Furthermore, internal regulations such as the Internal Salary Assessment, the Social Fund, the Bonus Regulation, and the Rating System for the evaluation of teams and departments were discussed. Throughout the year, submitted project proposals for open calls from various providers were reviewed. As an external member of the VRI Board, MVDr. Jana Kozáková, Ph.D. (Regional Veterinary Administration of the State Veterinary Administration for South Moravian Region) was appointed by the founder to replace the resigning Doc. Dr. Ing. Josef Kučera.

VRI and the Media

How important is paying attention to animal health in small ruminant herds?

Measures to reduce consumption and ensure proper use of antibiotics in broiler fattening

Advanced methods for the diagnosis, treatment, and prevention of mastitis caused by *Streptococcus uberis*



Research on direct breeding methods to increase disease resistance in dairy cattle

KEY PERFORMANCE INDICATORS

207 EMPLOYEES

Contract research 2024
15 mil. CZK

cooperation in **27** countries worldwide

valid patents **14**

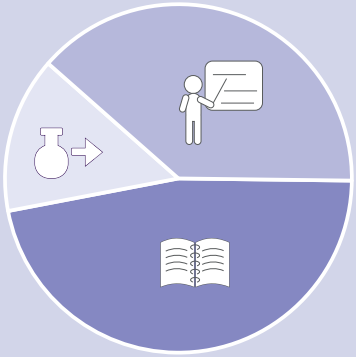
42 valid utility models

14 Research groups

40 PROJECTS

R&D Results 2024

- Publications
- Applied results
- Other results



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