



2022 YearBook



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Dear readers,

In 2022, and in preceding years, our Institute's mission was to produce and implement veterinary science results to safeguard and enhance animal welfare, animal health, and human health within the framework of agricultural research.

This Yearbook provides an overview of the activities and achievements that contributed to accomplishing this task. The structure of this Yearbook remains consistent with that of previous editions, ensuring the essential continuity and comparability of statistical data and time series.

If I were to highlight one notable success in 2022, it would be the preparation and submission of a project application in response to the second call for proposals of the National Centres of Competence announced by the Technology Agency of the Czech Republic. This project, titled "**National Centre for Biotechnology in Veterinary Medicine (NaCeBiVet)**", was subsequently selected for funding. Its consortium, consisting of 19 industry partners, is expected to play a significant role in facilitating the practical application of our scientific research findings.

Equally significant is the achievement of the **HR Excellence in Research** Award, which has set a new direction for our Institute in terms of human resources management in research. This award aligns our practices with the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

In the past year, the Institute diligently pursued nearly thirty projects covering a variety of thematic areas. The primary objective was to contribute to the sustainable development of livestock production and animal health, all while carefully considering the pressure to rationalise the use of antimicrobials.

This achievement would not have been possible without the financial support of the Ministry of Agriculture of the Czech Republic, our founder. Their institutional support, under the project titled "Long-term conceptual development of a research organisation", has been instrumental in enabling the VRI's activities. The majority of the funds for our Institute's various endeavours have been acquired through special-purpose support projects from a diverse range of providers, both national and international. These include projects from the Operational Programme OP RDI. Our scientific findings and work have been disseminated through scientific papers, publications aimed at the veterinary profession and agriculture industry, patents or utility models, and other channels for practical user engagement. Additionally, we have hosted traditional seminars under the name VRI ACADEMY.

These activities are directly complemented by our commercial endeavours, aimed at knowledge transfer and practical implementation of our expertise. In 2022, we established collaboration agreements with both domestic and international partners,

particularly from the industry, amounting to approximately 16.5 million CZK.

In 2022, the Institute faced several societal challenges, including the resurgence of African swine fever (ASF) in the Czech Republic, an energy crisis, unprecedented price increases, especially in the energy sector, and rising inflation. To address the ASF issue, the Institute published "African swine fever – Research results in the Czech Republic", providing a comprehensive understanding of the disease, its causative virus, and potential methods of diagnosis and prevention. In the field of energy, the Institute has undertaken measures to reduce energy consumption in its buildings and diversify energy sources, including the construction of a photovoltaic power plant.

And there will be other challenges, and I believe that as a public research institution, we will undoubtedly meet all the expectations associated with them.

For this, I would like to express special gratitude to the Institute's staff and all partners who are contributing, even if it is only through their suggestions, to collectively overcoming these challenges!

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
- Participation in operational programme projects and other R&D support programmes
- Strong partnership with industry
- Economic stability and commercial capabilities

Opportunities

- Research oriented towards achieving results with industrial and legal protection
- Project NCK- National Centre for Biotechnology in Veterinary Medicine
- 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

Weaknesses

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

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.



2030

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



Veterinary research in the field of prevention, control, diagnosis and treatment of animal diseases, welfare and animal care. Furthermore, study and research at the human-animal interface, including food safety, wildlife and ecosystem health, zoonoses and public policy in line with the OneHealth philosophy.

From the point of view of the medium-term mission, it is necessary to consider the following strategic priorities, which set the goals in areas that are crucial for us:

- "Farm-to-fork strategy" for fair, healthy and environmentally-friendly food systems
- EU biodiversity strategy in the field of biodiversity by 2030
- National Research, Development and Innovation Policy of the Czech Republic 2021+
- Concept of research, development and innovation of the Ministry of Agriculture for 2023+

The Institute has the following medium-term goals:

- **Scientific area**
 - Maintain and increase the number of publications in high-quality journals with impact factor above the median of the field
 - Maintain and increase the number of publications in journals for the veterinary and agricultural professionals
- **Application area**
 - Increase the number of outcomes with legal protection and their dissemination through licencing
 - Maintain and enhance collaboration with commercial partners to better align the defined research topics
 - Maintain and increase the volume of finances through invoiced activities
- **Project area**
 - Maintain the volume of financial resources from special-purpose support projects
 - Increase the number of special-purpose support projects acquired in collaboration with industry partners
 - Increase the volume of financial resources obtained from international collaboration
- **Development area**
 - Continue efforts to reduce the energy demand of buildings and diversification of energy sources through the use of the EPC method (Energy Performance Contracting)
 - Construction of new infrastructure and technical facilities

TOOLS

To achieve the objectives, the Institute employs a broad group of tools, with the following considered crucial:

- Establishing an internal evaluation system
- Bonus Rules and Licence Rules
- Strategy of a follow-up project of the long-term conceptual development of the research institution
- Creation and efficient use of the institutional asset reproduction fund
- The ability to utilize special-purpose support

The Institute runs laboratories for performing experiments under infectious and non-infectious conditions equipped with cutting-edge instruments, and also an experimental animal facility for keeping experimental animals, including performance of experiments under BSL 3 regime.

The Institute's premises offer considerable opportunities for further development and renovation of its infrastructure:

- In 2022, the renovation of the premises for the semi-operating unit in the Grade "D" cleanroom for the area of semi-solid and liquid pharmaceutical and cosmetic forms for non-injectable use, non-injectable preparations, veterinary preparations and pharmaceuticals was completed.
- In 2022, the construction of a photovoltaic power plant was completed, for which the VRI received a subsidy from the Operational Programme Environment. The power plant consists of a total of 249 photovoltaic panels with an output of 360 Wp. The total installed capacity of the photovoltaic system is 89.64 kWp.

The strategic plans for the development of scientific infrastructure within the medium-term concept include in particular:

- Construction of a veterinary biotechnology prototype unit (PROBIOVET) for faster and easier practical implementation by increasing the level of technological preparedness.
- The expansion of animal facilities for performing large animal experiments under infectious conditions in BSL2/BSL3 regimes.



Significant Events

A meeting of the Board of the Czech Academy of Agricultural Sciences (CAAS) was held at the VRI

On 5 April 2022, a meeting of the CAAS Board was held at the Veterinary Research Institute. The CAAS is a scientific advisory body to the Minister of Agriculture and its Board consists of the chairpersons of all departments of the Academy and two representatives of the Ministry of Agriculture. In addition to the regular agenda of the Board meeting, the Chairman of the department of veterinary medicine, Dr. Martin Faldyna, briefly presented the history and current state of the Institute. It also included a tour of a section of the upgraded infrastructure, made possible through the implementation of projects under the Operational Programmes.

The VRI was present at the 20th edition of VETfair 2022

The ALDIS Congress Centre in Hradec Králové was literally bursting at the seams. The 20th jubilee edition of the professional veterinary trade fair entitled VETfair took place there. The Veterinary Research Institute could not miss this event, which is unparalleled in the Czech Republic. Almost 1,000 visitors, predominantly veterinary practitioners, and around 100 companies - manufacturers of veterinary medicines, medical instruments, feeds and veterinary diets - filled the congress centre to its capacity.

Research activities, results of applied research and offers of collaboration with industry were presented at the Institute's exhibition.

At the conference "Mastitis in cattle" organized by the Czech Buiatrics Society, MVDr. Kateřina Nedbalcová, Ph.D. from the VRI presented a lecture entitled "Antibiotic resistance of bacterial agents causing mastitis".

"I am delighted that this year's anniversary edition had a turnout comparable to that at the pre-pandemic time. The high attendance at the exhibition was a unique opportunity for our Institute staff to meet with colleagues from the business world, offering inspiration on the directions we should prioritize," added MVDr. Martin Šanda, the PR manager of the VRI.

The VRI participated at the 48th annual Agricultural Fair "Bread Basket" 2022

As in previous years, in 2022 the VRI presented itself at the shared booth of departmental research institutions of the Ministry of Agriculture of the Czech Republic in Building T1. The VRI presented its activities in the field of veterinary and agricultural research and development, including the most important results achieved and transferred to end users. At the booth, visitors had the opportunity to see these results and learn more about the services and activities offered by the Institute, such as the VRI ACADEMY educational series. The booth was also visited by the Minister of Labour and Social Affairs Mr. Marian Jurečka.



Festival of Science 2022

From Friday 9 September 2022 to Sunday 11 September 2022, Hall A1 of the Brno Exhibition Centre was besieged by thousands of inquisitive visitors spanning all age groups.

The VRI has traditionally participated in this extensive festival, with its primary objective being the promotion of science.

This year, in the renovated Hall A1, we offered visitors an extensive exhibition focused on water, fish and ecology. This was in align with this year's spirit of the International Year of Artisanal Fisheries and Aquaculture. The youngest attendees had the opportunity, to assemble the life cycle of fish and frogs etc., while older participants and students engaged with demonstrations showing the application of thermal cameras in veterinary practice, or they just "took a photo of themselves" using a thermal camera. The



knowledge quizzes, which provided delightful complement to the exhibition, met with great interest.

The scientific section of the exhibition tried to draw attention to the presence of microplastics in the water and explained their impact on the life and health of fish. Visitors could also see under a microscope what lies concealed in the water of the nearby fountain, or determine the age of fish through examining their scales. The participation of the VRI in this event was supported by the Ministry of Agriculture of the Czech Republic under the programme for the support of education and consultancy.

We were delighted by the visitors' interest in science, and we are already planning what to offer them next year, especially given the impressive turnout of 10,000 attendees this year.

"In conclusion, we hope that the public will come away from this event with the knowledge that agriculture is not the primary contributor to environmental pollution. Additionally, we hope they will realise the role of scientific institutions in the Czech Republic in the effort to maintain a healthy environment, raise healthy animals in good living conditions and produce healthy local food," said Dr. Martin Faldyna, the VRI Director.





Night of Scientists 2022

On 30 September 2023, between 6pm and 10pm, the buildings of scientific institutions and laboratories were illuminated across the Czech Republic, marking locations where scientific work takes place.

Once again, this night was dedicated to scientists.

As usual, the VRI participated in this event with its interactive exhibition held at the Faculty of Chemistry of the Brno University of Technology (Purkyňova 464, Brno-Medlánky). The exhibition was prepared in align with this year's theme- SCIENCE WITH ALL SENSES.

The visitors had the opportunity to see unique videos from the micro-CT, such as the tick's intestinal peristalsis or the tick feeder. They had the opportunity to attempt identifying herbs used in veterinary medicine through smell and experience a form of "remote touch" using a thermal imaging camera. Those with a deeper interest in medicine could have the opportunity to listen to the heart sounds of dogs and cats, including both normal physiological sounds and those affected by heart murmurs.

The meeting of the Innovation Council for Regional Innovation Strategy for the South Moravian Region (RIS) was hosted by the VRI

On 29 November 2022, our institution had the opportunity to host a meeting of the Innovation Council for the Regional Innovation Strategy for the South Moravian Region (RIS JMK). Members of the Innovation Council are representatives of the management of the South Moravian Region and the Statutory City of Brno, Brno universities, key technology companies, non-governmental organizations, the South Moravian Innovation Centre and the South Moravian Centre for International Mobility. This time, the Council met to update the RIS Action Plan. As part of the presentation of new projects for inclusion in the action plan, information was given, among others, about the project plan coordinated by Mendel University in Brno in collaboration with the VRI. The project is being prepared for the Excellent Research call of the Operational Programme Johannes Amos Comenius (OP JAK).

At the beginning of the meeting, the VRI Director had the opportunity to briefly introduce the Institute and acquaint the participants with its scientific research endeavours.

"I am pleased that we could take this opportunity to introduce the Institute and its potential for enhancing collaboration with representatives

of key entities of the innovation ecosystem in the South Moravian Region and I anticipate engaging in collaborative efforts with them," says Dr. Martin Faldyna, VRI Director.



The PROFISH project participated in the International Year of Artisanal Fisheries and Aquaculture

The year 2022 was declared the International Year of Artisanal Fisheries and Aquaculture by the Food and Agriculture Organization of the United Nations. On a global scale, fish farming has an irreplaceable function, not only as a source of food, but also as an important element of cultural heritage. The same holds true in the Czech Republic, where the roots of traditional fish farming dates back to the Middle Ages, remaining a sustainable approach to managing natural resources. In addition to the economic and culinary benefits, the establishment and maintenance of ponds also yield a positive impact on the surrounding environment, particularly through their contributing to water retention in the landscape and mitigating runoff.

The Veterinary Research Institute has been engaged in research aimed at enhancing the conditions and health status of domestic fish species for a long time. In addition to the Long-term concept of development of the organization, which deeply addresses the matter of fish diseases, two national projects were implemented at the Institute. The project entitled "Optimization of parasitic disease management on fish farms with a focus on *Ichthyophthirius multifiliis* infection in rainbow trout" is funded by the National Agency for Agricultural Research of the Ministry of Agriculture. The other project entitled "Sustainable production of healthy fish in various aquaculture systems PROFISH" was implemented thanks to the Ministry of Education, Youth and Sports under the Operational Programme Research, Development and Education.

The PROFISH project was launched in 2019 and is nearing completion in 2022. Therefore, a working conference was held on 22-23 November 2022 at the Balloon Hotel in Radesin. It was attended by senior staff of the recipient (VRI) and partners (Mendel University in Brno and the Faculty of Fisheries and Protection of Waters of the University of South Bohemia in České Budějovice) and researchers from individual research

groups. Approximately 40 attendees listened to a series of lectures on various research goals and plans of the project. A part of the conference was devoted to administrative matters, and discussion focused mainly on the successful completion of the project.

The VRI's excellence in the field of aquaculture is underlined by its scientific achievements. Besides co-authoring 6 scientific publications on fish health in 2022, VRI authors received two awards. The first place in the Minister of Agriculture Award for Young Scientists was given to MVDr. Nikola Hodkovicová, Ph.D. for her work on "Does oral intake of polyethylene microparticles affect the health status of rainbow trout (*Oncorhynchus mykiss*)?". First prize was also awarded to MVDr. Hana Minářová, Ph.D. in the Science for the Earth competition of the National Museum of Agriculture and the Czech Academy of Agricultural Sciences for her dissertation entitled "Optimization of immunological methods in fish". In addition to the offer of diagnostic services and consultancy within the accredited laboratory for viral diseases of fish, the collaboration with experts and breeding community was further strengthened through the seminar "Fish health issues", which took place on 25 May 2022 as part of the VRI ACADEMY workshop series.



Czech Minister of Agriculture Visited the VRI

On 5 December 2022, Czech Agriculture Minister Ing. Zdeněk Nekula visited the Veterinary Research Institute. The Minister acquainted himself with the current situation and the professional activities underway at the Institute. Dr. Faldyna, Director of the Institute, presented the publication on African swine fever entitled "African swine fever – Research results in the Czech Republic", which was produced in collaboration with eight Czech institutions. The upcoming strategic projects aimed at supporting cutting-edge science, supporting collaboration with the industry or supporting human resources were also presented. The Minister had the opportunity to do a brief tour of part of the premises and the scientific infrastructure, and also to take a look inside the experimental animal facilities where scientific experiments were not currently in progress. The VRI ACADEMY seminar focused on health issues in honey bee colonies, the possible causes of problems in bee keeping or the possibility of using

defined probiotic cultures as a way to reduce the consumption of antimicrobials in poultry and pig herds was followed by a discussion.



Top Researcher Home Awards in 2022

Three Prizes of the Minister of Agriculture go to the VRI

Traditionally, the Ministry of Agriculture, together with the Czech Academy of Agricultural Sciences, announced a competition for the Minister of Agriculture Award for Young Scientists and the Minister of Agriculture Award for the best result of research and experimental development transferred to end-user.

On 25 August 2022, on the occasion of the opening of the 48th annual Agricultural Fair "Bread Basket", the **Minister of Agriculture Ing. Zdeněk Nekula** presented awards to the winners.

From the Veterinary Research Institute, three employees, specifically two female scientists and one male scientist were awarded.

In the category of the Minister of Agriculture Award for Young Scientists, the **1st prize** was awarded to **MVDr. Nikola Hodkovicová, Ph.D.** for her study entitled: **Does oral intake of polyethylene microparticles affect the health of rainbow trout (*Oncorhynchus mykiss*)?**

The study focused on defining the toxicity of microplastics that contribute to the global pollution of water bodies. "Our experiment investigated the oral toxicity of polyethylene microparticles in rainbow trout and identified the potential for microparticle passage into body organs and disruption of fish health at several analytical levels. As a result, this can cause problems not only to individual fish, but also to the target consumer," the author said.

Honourable mention of the Minister of Agriculture was given to **Ing. Lucie Hlucháňová, Ph.D.** for the study entitled: **Vacuum-packed steak**

tartare: The prevalence of *Listeria monocytogenes* and evaluation of the efficacy of Listex™ P100.

"The study focused on the prevalence of *Listeria monocytogenes* in vacuum-packed steak tartare retained in the Czech Republic and the characterization of the obtained strains by typing methods. The study also included a model experiment to evaluate the efficacy of the commercial phage preparation Listex™ P100 against *L. monocytogenes* artificially inoculated into samples of steak tartare," said Dr. Hlucháňová.

The second place in the category of the best research and experimental development result transferred to an end-user was awarded to **MVDr. Kamil Kovařík, Ph.D.** for the diagnostic kit: **Immunoenzymatic kit (ELISA) for the screening determination of antibodies against *Mycobacterium avium* spp. paratuberculosis (MAP) in bovine serum, plasma and milk**, which was launched in 2021 and has been selling successfully.

"The kit is used to diagnose paratuberculosis as part of the disease control methods and certification programme on cattle farms in the Czech Republic and abroad," explained Dr. Kovařík.

"For the VRI, this means a significant recognition of scientific work, we congratulate all the awardees and wish them further success in both their professional and personal life," added MVDr. Martin Faldyna, Ph.D., VRI Director.



Medica Veterinaria 2021 Award Ceremony

A festive gathering of prominent figures in veterinary medicine took place in the splendid Municipal House in Prague, a masterpiece of Czech Art Nouveau. On the occasion of the 6th edition of Medica Veterinaria 2021, awards for lifetime achievement and outstanding contributions to the field, as well as publications were presented.

The event, announced by the professional journals Veterinářství and Veterinární medicína, publisher Profipress,s.r.o., was held under the auspices of the Rector of the Veterinary University in Brno, Prof. MVDr. Alois Nečas, Ph.D., MBA, President of the Chamber of Veterinary Surgeons of the Czech Republic, MVDr. Petra Šinová and MVDr. Zbyněk Semerád, Director General of the State Veterinary Administration of the Czech Republic. The Veterinary Research Institute received the most awards. The Medica Veterinaria 2021 Award was presented to the following scientists:

- **in the category for the lifetime contribution to veterinary medicine**

MVDr. Josef Krejčí, in memoriam

MVDr. Josef Krejčí was one of the most prominent figures of veterinary research, closely affiliated with the Veterinary Medicine Research Institute in Brno. His expertise primarily lay in the field of infectious diseases and immunity of farm animals. He also contributed to the development of preparations for the stimulation of non-specific immunity. In the field of studying new routes of vaccine administration, he was mainly involved in intradermal administration.

- **in the category for outstanding contribution to veterinary medicine, two colleagues were awarded**

Prof. MVDr. Alfred Hera, CSc.

Prof. MVDr. Alfred Hera, CSc. was a long-time director of the Institute for State Control of Veterinary Biologicals and Medicines, Professor of pharmacology at the University of Veterinary and Pharmaceutical Sciences in Brno and its Vice-chancellor. As the Acting Director of the Veterinary Research Institute, he contributed to the intensification of the direction of scientific and research endeavours of the Institute toward applications in veterinary practice and agriculture.

MVDr. Kamil Kovařík, Ph.D.

MVDr. Kamil Kovařík, Ph.D., Head of the research group of Diseases of Ruminants at the Department of Infectious Diseases and Preventive Medicine of the Veterinary Research Institute received the award for establishing immunodiagnostic procedures for the detection of bovine paratuberculosis. The kit for the detection of antibodies to the causative agent of this disease in serum and milk samples is manufactured by a commercial company following approval by the Institute for State Control of Veterinary Biologicals and Medicines. The kit will be utilised to implement a disease certification programme on cattle farms.

- **for publishing activities, a professional paper in the journal Veterinářství / Veterinary Clinic in the category of POULTRY DISEASES**

MVDr. Kateřina Nedbalcová, Ph.D. received the award for the paper entitled- Phenotypic resistances of the isolates of Enterococcus species in chicken farms in the Czech Republic between 2020 and 2021.

The paper summarizes the results of monitoring the prevalence and antibiotic resistance of Enterococcus isolates (*Enterococcus faecalis* and *Enterococcus faecium*) in chicken farms in the Czech Republic.

Enterococci are considered faecal indicator bacteria in the environment for monitoring microbial sources of contamination and are often used in monitoring antibiotic resistance trends. They are also serious human pathogens. They have been implicated in almost 12% of all nosocomial infections, with approximately 90% of these infections caused by just two species: *E. faecalis* and *E. faecium*.

The detection of resistant populations of *E. faecalis* and *E. faecium* to various antibiotics gives evidence that enterococci displaying varying levels of resistance to different antibiotics are still present in poultry farms despite the implementation of stricter regulatory measures to promote the responsible use of antibiotics in livestock farms. Their spread may be a potential risk to agriculture and food industry workers and their environments.



Czech Minister of Health awarded a project with the participation of the VRI scientists

The Czech Health Research Council (AZV) submitted sixteen projects for consideration for the Minister of Health Award for Medical Research and Development 2021, out of which the Science Council and the Board subsequently selected ten candidates.

The prize in the category of the Minister of Health Award for Medical Research and Development 2021 was presented to PharmDr. Josef Mašek, Ph.D., who participated in the project entitled "Nanoliposomal systems for rapid thrombus diagnosis using MRI", the principal investigator of which was Prof. MUDr. Robert Mikulík, Ph.D. from St. Anne's University Hospital in Brno. The research team at the VRI had successfully developed nanoparticles that were then utilised in developing a method for imaging blood clots. This method could aid in diagnosing severe conditions like strokes, heart attacks and pulmonary embolisms.



MVDr. Hana Minářová, Ph.D. won the first place in the SCIENCE FOR THE EARTH competition.

The 7th edition of the competition for the best bachelor's, master's and doctoral thesis was announced by the National Museum of Agriculture in collaboration with the Czech Academy of Agricultural Sciences as part of the national event Scientists' Night taking place on Friday 30 September 2022 at the National Museum of Agriculture. This year's edition included two additional topics, Traditional fishing and aquaculture, as well as Common and non-traditional cereals.

MVDr. Hana Minářová, Ph.D. won the first prize in the dissertation category with her thesis entitled "**Optimisation of immunological methods in fish**". She conducted the thesis under the patronage of the Faculty of Veterinary Hygiene and Ecology of VETUNI Brno, under the supervision by Doc. MVDr. Miroslava Palíková, Ph.D. and by MVDr. Petra Ondráčková, Ph.D. from the Veterinary Research Institute where Dr. Minářová works at the Department of Infectious Diseases and Preventive Medicine. The winning study was primarily made possible through the financial support of the project of the Operational Programme Science-Research-Education entitled "Sustainable production of healthy fish in different aquaculture systems- PROFISH".

Both the topic of the dissertation and the focus of the project corresponded with the International Year of Artisanal Fisheries and Aquaculture, which was declared by the United Nations for 2022.

Such an award is always gratifying and motivates us to keep working. Dr. Minářová added:

"My thesis focused on optimising immunological methods in rainbow trout. These methods are currently used in laboratory practice. In the future I plan to optimize them for other fish species."



The VRI received the HR Excellence in Research Award (HR Award)

The VRI received the prestigious HR Award, which gives evidence not only of the right approach to managing human resources, but also the provision of high quality working conditions, opportunity for professional growth and a transparent process for recruiting both research and non-research personnel. This award also makes the VRI attractive in the context of global research.

The European Commission bestows the HR Award upon research institutions that adopt and implement the HRS4R strategy (The Human Resource Strategy for Researchers). It is based on the principles enshrined in the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers. This is European Commission Recommendation No. 2005/251/EC, which commits research institutions to creating quality working conditions, promoting professional development and following transparent recruitment procedures for researchers and non-scientists.

The primary mission of the HR Award is to make progress in improving the work conditions for researchers and administrative personnel. "We are working to expand this initiative. To support our efforts, we conducted a questionnaire survey within the Institute and held several meetings with staff members to introduce this concept. We are committed to creating an appealing, enjoyable, and motivating work environment for all VRI employees" says Ing. Jiří Kolísek, HR Award Coordinator.

Awards for long-term support of the development of the Holstein breed in the Czech Republic

On 6- 7 December 2022, the Holstein Cattle Breeders' Association held its board meeting at the Jezerka Congress Centre in Seč, combined with the traditional Holstein cattle breeders' gathering and a professional seminar. In celebration of the 30th anniversary of the Association's founding, awards were presented to recognise long-term contributi-

ons to the development of the Holstein breed in the Czech Republic. Representatives from the VRI, **Doc. MVDr. Soňa Šlosárková, Ph.D.** and **MVDr. Kamil Kovařík, Ph.D.** were presented with a commemorative plaque.



HR EXCELLENCE IN RESEARCH



Technology Transfer Award in Slovakia 2022

The Slovak Centre for Scientific and Technical Information awarded the Slovakia Technology Transfer Award 2022 for the tenth time during the COINTT 2022 conference on 18 and 19 October 2022 in Bratislava. Among the awarded innovations there are treatments for bone diseases, composite materials and a the Honey laboratory. The first prize in the Innovation category was awarded to a patent-protected invention for treating bone diseases. The VRI collaborated with Comenius University in Bratislava on the development of this invention. One of the authors of the patent application titled "Nanoformulation of gold for therapy of inflammatory and degenerative diseases of bones, joints and cartilage" is Doc. Hošek from the Department of Pharmacology and Toxicology.

"The prepared nanoparticles of gold and gemini surfactants exhibit promising anti-inflammatory and chondroprotective properties. In the future, this potential could prove particularly useful in the treatment of inflammatory joint diseases such as arthritis, in which gold-containing drugs have been used for decades. Thanks to the low toxicity of the nanoparticles we have developed, their application can extend to both animal and human patients." explains Doc. Hošek from the VRI.



Awarded employee	Subject of the award	Date of presenting the award
MVDr. Josef Krejčí	Medica Veterinaria- Lifetime contribution to veterinary medicine- in memoriam	3 May 2022
MVDr. Kateřina Nedbalcová, Ph.D.	Medica Veterinaria – Professional paper in journals Veterinářství, Veterinární klinika	3 May 2022
Prof. MVDr. Alfred Hera, CSc.	Medica Veterinaria - Outstanding contribution to veterinary medicine	3 May 2022
MVDr. Kamil Kovařík, Ph.D.	Medica Veterinaria - Outstanding contribution to veterinary medicine	3 May 2022
Doc. MVDr. Soňa Šlosárková, Ph.D.	Award and Commemorative Plaque for long-term support of the Holstein breed development in the Czech Republic	21 August 2022
MVDr. Nikola Hodkovicová, Ph.D.	Minister of Agriculture Award for Young Scientists for 2022	25 August 2022
MVDr. Hana Minářová, Ph.D.	Science for the Earth – 1st place in the dissertation category	30 September 2022
Mgr. Aneta Hollerová	3rd place – Conference IGA 2022	13 December 2022
MVDr. Kovařík Kamil, Ph.D.	Medica veterinaria Award 2021 for outstanding contribution to veterinary medicine	3 May, 2022
	Minister of Agriculture Award for the best result transferred to end user, 2nd place	25 August 2022
	Honourable mention from the Holstein Cattle Breeders Association for long-term support of the development of the Holstein breed in the Czech Republic	7 December 2022
Ing. Daniela Karasová, Ph.D.	Best Poster Award, 2nd place	30 June 2022
Ing. Lucie Hlucháňová, Ph.D.	Honourable mention from the Minister of Agriculture of the Czech Republic for the study entitled Vacuum-packed steak tartare: Prevalence of Listeria monocytogenes and evaluation of the efficacy of Listex™ P100	25 August 2022
RNDr. Petra Musilová, Ph.D.	International conference in Telč titled "GENETIC TOXICOLOGY AND CANCER PREVENTION"- 3rd place for the poster "Air Pollution and Sperm Telomere Length".	5 May 2022
PharmDr. Josef Mašek, Ph.D.	Minister of Health Award for Medical Research and Development for 2021 "Nanoliposomal systems for rapid thrombus diagnosis by MRI"	7 June 2022

Projects in 2022

Submitting of a project proposal to the competition of the Technology Agency of the Czech Republic for establishing National Centres of Competence and the subsequent obtaining of support for its implementation was crucial for 2022 in this area. The recently established National Centre for Biotechnology in Veterinary Medicine, NaCeBiVet, coordinated by the VRI, aims to create a solid and long-term basis for applied research by concentrating the research capacities of seven research institutions in the field of biotechnology in veterinary medicine, animal production, and related areas. A total of 18 project proposals were submitted by the VRI in response to national and international calls announced in 2022.

The support was granted to a total of 7 special purpose projects. Furthermore, in 2022, certain research projects of the Operational Programme Research, Development, Education, such as the project entitled "Pharmacology, Immunotherapy, NanoToxicology - FIT (CZ.02.1.01/0.0/0.0/15_003/0000495) and the project "Probiotic bacteria of the intestinal microflora as a basis for animal health and well-being" PROBIOTIKA (CZ.02.1.01/0.0/0.0/16_025/0007404) were successfully completed.

Cell-mediated multilayered 4th-generation biomimetic scaffold for single-step total skin substitution: From laboratory to clinical application

Investigator at the VRI: MVDr. Martin Faldyna, Ph.D.

Skin tissue engineering using non-toxic resorbable biomaterials has seen major advances in the last few decades. In the skin, as a whole, there are different cell populations that are arranged in a unique three-dimensional matrix, creating a complex microenvironment for individual cellular interactions. The use of "mere" cell-free biomaterials enriched with e.g. growth factors cannot fully substitute both the anatomical and functional part of this skin microenvironment. Currently, the study of the interaction between the carrier and the cell population prepared under defined laboratory conditions is coming to the fore with the explicit goal of creating a full-thickness artificial skin substitutes that respect key aspects of native human skin. Today, several candidate biomaterials have been defined that play a crucial role in the development of artificial skin. The key challenges that we have to overcome in successfully addressing the issue of creating a total skin substitute are not only related to the physicochemical pro-

erties of biomaterials (elasticity, wettability, biodegradability, etc.) or the types of cells used (their level of differentiation, specificity of cell types for each layer of the final substitute, etc.), but especially their mutual interactions and immunological response in the case of in-vivo implantation, which is crucial for the usability of these materials. Thanks to previous projects, we developed and successfully tested the biocompatibility of materials based on natural polymers such as collagen and chitosan with a nanomaterial polysaccharide layer imitating the basement membrane. Their combination with mesenchymal stromal cells (MSCs) at different levels of differentiation respecting a certain autonomy of individual skin layers seems to be the most promising way to prepare a final functional biomaterial that can fully imitate both the anatomical hierarchy and specific functions of native human skin.





NATIONAL CENTRE FOR BIOTECHNOLOGY IN VETERINARY MEDICINE

ABOUT THE PROJECT

The aim of the project is to establish a stable and long-term basis for applied research by concentrating the research capacities of seven research institutions in the field of biotechnology in veterinary medicine, animal production and related areas. In terms of its impact, the project aims to support the sustainable production of high-quality and safe food of animal origin in the context of the implementation of the policy of reducing the consumption of antibiotics, improving farmed animal welfare, preserving landscape biodiversity and adhering to circular economy principles. The results generated in the project in the form of new or innovative products and services are expected to enhance the competitiveness of the involved enterprises.

PROJECT PARTNERS
26 partners

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Preclinical studies of non-platinum metal-based medicines in lung cancer therapy

Investigator at the VRI: Doc. RNDr. Jan Hošek, Ph.D.

Lung cancer is a malignant tumour of various tissues of the lung which, together with breast cancer, is the most commonly diagnosed type of tumour worldwide, accounting for about 11% of the approximately 19 million cases. Furthermore, lung cancer stands as the primary cause of cancer-related fatalities, with a mortality rate approximately twice the rate of the second leading cause, which is colorectal cancer. Considering that smoking, accounting for approximately 85-90% of cases, is the predominant cause, there is a clear imperative to pursue the development of new drugs for lung cancer therapy. The project focuses on the experimental development of new drugs and therapeutic formulations for the chemotherapy of lung cancer. The anticancer activity of organo-metallic compounds of selected transition metals (Ru, Rh, Ta, Os and Ir) for which cytotoxicity assays have recently been performed (proof-of-concept for the submitted project) or which will be newly prepared within the project will be studied in detail. Attention will be paid to a detailed study of the stability of the newly prepared compounds in

different media (e.g. blood serum). The prepared complexes will then be tested in vitro on cancer cell lines (including resistant ones) and non-cancer cell lines derived from the lung tissue. The activity of effective compounds with significant selectivity towards cancer cells will be verified in a preclinical mouse model of lung cancer. The effect of these agents will be further modified by formulating them into liposomes in order to increase their activity by targeting cancer cells and reduce side effects. We expect that the results will provide original findings on the anticancer activity of new metallo-drugs and the possibilities of their formulation into nanocarriers. The project will involve workplaces that have long been successfully focusing on research and development of new biologically active coordination compounds (Department of Inorganic Chemistry, Palacký University in Olomouc) and supramolecular targeted therapeutics (Department of Pharmacology and Immunotherapy, Veterinary Research Institute in Brno).

Treatment of infections caused by multidrug-resistant bacterial strains with novel antibacterial agents based on cathelicidin antimicrobial peptides

Investigator at the VRI: RNDr. Lubomír Janda, Ph.D.

The current increase in resistance of microorganisms is a worldwide problem not only in hospitalized patients but also in patients treated on an outpatient basis. Therefore, it is necessary to look for alternative therapies that would reduce the selection pressure of antibiotics on the microorganisms and increase the chance of eradication. Advanced carriers for targeted and sustained release of antimicrobial agents are currently gaining interest. Promising carriers include hydrophobic materials, liposomes or collagen polymers. Based on our preliminary results, collagen polymers in particular meet the current requirements. Antimicrobial peptides have an effect on a broad spectrum of pathogens,

Study of exosomal microRNAs in gliomas: Implications for diagnosis and innovative therapies

Investigator at the VRI: Mgr. Martina Hýždálová, Ph.D.

Gliomas represent a group of the most prevalent malignant brain tumours characterized by variable behaviour and prognosis. Based on the histopathological classification, these tumours are divided into prognostically more favourable low-grade gliomas and high-grade gliomas, which are generally more aggressive. However, even within these groups, the prognosis of individual patients varies considerably and histopathological examinations are unable to predict individual risk. Therefore, it is very important to find new molecular biomarkers to predict the clinical response in glioma patients and to help more individualize their treatment. The tumour microenvironment plays an important role in disease manifestation and its stimulation is essential for gliomagenesis. Exosomal microRNAs (miRNAs) could represent one form of intercellular communication over both short and long distances. These highly stable short

both Gram-positive and Gram-negative bacteria, micromycetes and viruses. They also promote wound healing by increasing angiogenesis, regeneration and re-epithelialization. In the project, we will focus on a modern approach to infection control, using a combination of suitable carriers and antimicrobial peptides based on cathelicidins, mainly targeting multidrug-resistant strains of Gram-negative bacteria, which will be released in a controlled manner. The efficacy of the formulations against pathogens and their controlled release will be tested in vitro and preclinically in a porcine animal model.

non-coding RNAs are post-transcriptional repressors of gene expression involved in the regulation of almost all cellular and biological processes. Their important role is further reinforced by the fact that aberrant miRNA levels are associated with the development of many diseases, including gliomas. In addition, exosomes exhibit their own unique donor cell surface structures that increase their affinity for stromal cells present in the microenvironment. Thus, exosomal miRNAs circulating in cerebrospinal fluid could represent a promising diagnostic tool to predict glioma behaviour and patient prognosis. At the same time, a deeper understanding of the mechanism of communication within the tumour microenvironment could lead to new therapeutic options not only for gliomas but also for other cancers.

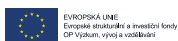
PROBIOVET - VETERINARY BIOTECHNOLOGY PROTOTYPE UNIT

ABOUT THE PROJECT

The project is implemented within the programme Smart Accelerator in the South Moravian Region II, ACTIVITY – ASSISTANCE, No. JMK 118711/2021. The aim of the project is to prepare project documentation and construction documentation, feasibility study up to the stage of implementability of the project plan for the construction of a Veterinary Biotechnology Prototype Unit (PROBIOVET). The aim of the project is to support the development of proof-of-concept activities and strengthening the VRI competence in the field of innovation and technology transfer.

jihomoravský kraj

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EVROPSKÁ UNIE
Evropské strukturální a investiční fondy
OP Výzkum, vývoj a inovace



INSTITUT VETERINÁRNÍ BIOTECHNOLOGIE
VÝZKUM A TECHNOLOGIE



Optimising the management of parasitic diseases on fish farms with a focus on *Ichthyophthirius multifiliis* infection in rainbow trout
Investigator at the VRI: MVDr. Ľubomír Pojezdal, Ph.D.

The project outcome will be the extension of knowledge about the possibilities of fighting infections of parasitic origin under conditions of intensive farming of salmonids and partially also semi-intensive farming of cyprinid fish. Verification of the efficacy of antiparasitic drugs that have not been registered until now after use in fish for consumption is the basis for their successful implementation in practical use. The development of a controlled drug release technology in the digestive tract of fish will reduce the biological and ecological burden that the application of any drug poses to the fish organism and the environment. The combination of this information, complemented by possibilities of disinfection and early diagnosis, will allow the best

procedure for management of health problems of parasitic origin in freshwater fish farming, especially salmonids, to be determined and shared. The project is included in the key area of Sustainable Food Production because fish is a valuable, sustainable and, in the case of common carp and rainbow trout, local food. In addition to climate change, fish production in domestic aquaculture is also significantly affected by infectious agents, including parasitic diseases. The expansion of therapeutic options and optimisation of non-pharmacological measures has the potential to prevent a reduction in the profitability of farms and the deterioration of fish health and welfare.

Measures to reduce the consumption and prudent use of antibiotics in broiler fattening in the Czech Republic
Investigator at the VRI: Doc. RNDr. Ivan Rychlík, Ph.D.

The aim of the project is to reduce the consumption of antibiotics in broiler fattening. We will replace the administration of antibiotics in the first days of life with a new generation of probiotic strains. These will be identified in experiments in which chicks will be raised in the presence of adult hens. In addition to the already known data about the digestive tract, we will obtain information on the bacteria of the skin and respiratory tract microflora that are transmitted from hens to chicks and that are absent in hatchery chicks. The selected bacteria

will be obtained in pure cultures and used for preparation of defined probiotic mixtures, the efficacy of which will be compared with that of antibiotics in chicks after APEC infection. The final objective will be to develop methods for the detection of antibiotics in the farm environment to verify the reduction of the environmental antibiotic burden after the administration of probiotics.

Certification of dairy cattle herds according to antimicrobial consumption and mammary health in order to reduce their consumption, rationalise their use and control the resistance to them
Investigator at the VRI: Doc. MVDr. Soňa Šlosárková, Ph.D.

To propose and verify under practical conditions an incentive classification (A-C) of dairy cow herds according to mammary health and antimicrobial (AM) consumption, taking into account the application forms and the importance of AM groups. To construct a multicomponent index for classification, composed of three basic parameters reflecting in a different way the number of somatic cells in milk (SC), the prevalence of treated mastitis, and both total and structured AM con-

sumption. Propose mechanisms for defining and setting parameters. Create a web application for the certification system. Develop tools for selective drying-off and test the efficacy of the pre/postdips used, with an emphasis on the mastitis agents, including possible contribution to AM resistance. For the conditions of the Czech Republic, develop a set of tools aimed at strengthening the health of dairy cattle while reducing and rationalising AM consumption.

Reasonable design of polysaccharide particle systems for the delivery of drugs with a broad spectrum of biological activity for mucosal therapy

Investigator at the VRI: PharmDr. Josef Mašek, Ph.D.



Polysaccharides are essential biomacromolecules that have important biological functions in all living forms. The wide range of pharmacological activities (anticancer, antimicrobial, antioxidant, antiviral and hypoglycemic) makes them one of the most promising candidates in the biomedical and pharmaceutical fields. A key property enabling their diverse applications is the ability of polysaccharides to respond to physical stimuli and their readiness to undergo chemical and structural transformations leading to desired properties. The priority of therapeutic requirements in pharmaceutical technology is the targeted

preparation of dosage forms with controlled physicochemical properties with respect to the delivery site and drug release rate. The aim is to create new smart drug carriers using the pharmacological activities of polysaccharides combined with their ability to respond to external stimuli and change their internal structure. The project plan is to find, understand and define, through detailed structural analysis, the relationships of self-assembly processes in drug-polysaccharide systems that lead to desirable pharmaceutical activity.

Other project providers



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PROGRAM 9 F.i. Professional Consultations

Investigator at the VRI: Doc. MVDr. Soňa Šlosárková, Ph.D.

In 2022, the VRI was involved in agricultural production consultancy subsidised by the Ministry of Agriculture, specifically by the 9.F.i. programme: Support for agriculture consulting, Professional consultations. Within the framework of this programme, the VRI staff planned to provide 325 consulting hours for a total amount of CZK 455,000 CZK, for which they applied for a subsidy.

The VRI staff reported 246 hours of consultations (75.7% of the plan) for the whole year 2022 and therefore a total amount of CZK 344 512

was paid to SZIF in two partial stages (July and December 2022). 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.

ABOUT THE PROJECT

- ▶ The project focuses on the development of recombinant high-affinity ligands, recombinant protein and DNA vaccines with corpuscular carriers and molecular adjuvants, which represents a new biotechnological trend in the development of recombinant vaccines, highly selective immunotherapeutics, diagnostics and theranostics.

PROJECT PARTNERS

UP Olomouc
IBT Prague
UCT Prague

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**PROBIOTIC BACTERIA OF GUT MICROBIOTA
AS THE BASIS OF ANIMAL HEALTH AND WELFARE**

ABOUT THE PROJECT

- ▶ Selection of new bacterial isolates from poultry and pigs and determination of their complete genome sequence.
- ▶ Verification of the ability of these isolates to colonize the digestive tract of chickens and piglets.
- ▶ Testing the host response to colonization by selected bacterial isolates with probiotic potential.
- ▶ Identification of probiotic isolates which increase the natural resistance of chickens and piglets to infection with Salmonella, Campylobacter and pathogenic *E. coli*, including antibiotic-resistant clones.

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PRO

SUSTAINABLE PRODUCTION OF HEALTHY FISH IN VARIOUS AQUACULTURE SYSTEMS

ABOUT THE PROJECT

- ▶ Study of relationships between fish, pathogens and environmental conditions affecting fish health and economic output from aquaculture production.
- ▶ Study of technological, animal husbandry and nutritional factors, the effects of environmental pollution and the use of antibiotics. Other activities will be aimed at the investigation of causative agents of infectious diseases and immune mechanisms.

PROJECT PARTNERS

Mendel University in Brno
University of South Bohemia
in České Budějovice

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HEALTHY AGEING IN INDUSTRIAL ENVIRONMENT

ABOUT THE PROJECT

- ▶ The project addresses the effects of selected environmental and lifestyle risk factors on health and ageing of the population in an industrial area.
- ▶ Numerous studies are being conducted under four research programmes in different population samples (mortality, morbidity, molecular-epidemiological and genetic studies, cytogenetic studies, exposure studies, fertility studies, increased physical activity studies, socio-economic and psycho-social studies).

PROJECT PARTNERS

University of Ostrava
Institute of Experimental Medicine CAS
Faculty of Education, University of Ostrava

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International Collaboration

In most scientific fields, the Institute has achieved a significant position within the Czech Republic and in many fields internationally. Research teams were successful in obtaining and implementing projects across all grant levels, including international ones (projects funded by the EU, Norway Grants, etc.). International collaboration is facilitated not only by study stays of the Institute's staff abroad and membership of the Institute's scientists in international committees of professional societies, but also by long-term working or study stays of the Institute's staff in various countries of the world.

The VRI is a member of the international platform BIOEAST- Central Eastern European Initiative for Knowledge-based Agriculture, Aquaculture and Forestry in Bioeconomy and is active in HEVnet, a global network of scientists working in reference laboratories for hepatitis E. In 2022, the Institute became an associate member of

the Bio-based Industries Consortium (BIC), a non-profit organisation founded in 2013 in Brussels to connect and strengthen the biotechnology-based industry sector.

The long-term collaboration with renowned international universities and research institutes is evidenced by joint projects, publications, shared patents, and formal agreements. The Institute entered into 16 agreements in 2022. A notable achievement involves the submission of an international patent application for the treatment of bone diseases. The invention entitled: Nanoformulation of gold for the therapy of inflammatory and degenerative diseases of bones, joints, and cartilage, in the development of which the VRI participated in collaboration with Comenius University, won the Award for Technology Transfer in Slovakia 2022 in the category Innovation.





HUMANS

ONE HEALTH



ENVIRONMENT



ANIMALS



**THE ONE HEALTH EUROPEAN
JOINT PROGRAMME**

ABOUT THE PROJECT

The aim is to create a sustainable European One Health framework by integration and alignment of medical, veterinary and food production research through shared programming of research agendas matching the needs of European and national policy makers and stakeholders.

The project includes:

- Foodborne Zoonoses (FBZ)
- Antimicrobial Resistance (AMR)
- Emerging Threats (ET)

**PARTNERS:
CONSORTIUM OF 37 PARTNERS**



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**INTERREG CROSS-BORDER COOPERATION
V-A AUSTRIA-CZECH REPUBLIC
FOR PROGRAMMING PERIOD 2014- 2020**

Initiative for the promotion of research and innovation capacity of veterinary service in poultry production

ABOUT THE PROJECT

The main goal of the project is to increase and improve poultry products in the region. The importance of this goal is reflected in the worldwide increased demand for poultry products, especially poultry meat. A prerequisite for increasing production is the health of the animals and the associated welfare.

PARTNER: Veterinärmedizinische
Universität Wien

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NeoGiANT

**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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**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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 **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 (TBEV) 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

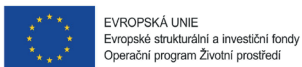
Contact:
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Projects for reducing energy consumption in buildings

Projects to reduce the energy demand in buildings FVE for the Veterinary Research Institute

in 2022, as part of the Operational Programme Environment under the Specific Objective: 5.3- Reduce energy consumption and increase the use of renewable energy sources in central government buildings, the installation of solar panels on the Animal Facilities 4-5 building was completed. The total amount of the subsidy was CZK 2.8 million. The power plant consists of a total of 249 photovoltaic panels with an output of 360 Wp, the total installed capacity of the photovoltaic system is 89.64 kWp. Putting in commission, including the first wiring, was planned for the first quarter of 2023.

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Ministerstvo životního prostředí
České republiky



Transfer of Results to End-Users

Transfer of new knowledge and commercialisation of new technologies is a very important activity complementing the primary mission of the Institute. The Institute is aware of the need for these activities and finds new solutions and approaches to meet and innovate this need (resources). In particular, oriented research, the quantity and quality of partner networks, and the active strengthening of collaboration with the application sphere play an important role.

The aim of the intellectual property protection and knowledge transfer policy is primarily to ensure the use of items created by employees in such a way that they generate benefits for the VRI to the maximum extent possible; it may not always be profitable, but it always aims at positive impacts on animal health, the environment and society.

The Centre for Technology Transfer and Project Support (CTT PS) is a unit coordinating activities related to the commercialisation of new knowledge and technologies developed in respective research departments of the Institute, whose main activities in this area are: Monitoring of research activities and new knowledge, evaluation of the commercial potential of new knowledge, ensuring the protection of intellectual property for the created objects, management of the intellectual property portfolio, consultancy, provision of contractual documents, preparation of internal regulations, licensing policy, promotion of results, consultations, analyses and provision of external legal services.

As of 31 December 2022, the Institute's intellectual property database contained a total of 13 valid national and international patents and 36 utility models, of which a total of 3 patents and 7 utility models were registered in 2022.

In 2022, US patent EP 3535238 was granted: Aminoxylipids for the construction of self-assembling liposomal systems enabling their subsequent modification by biologically functional molecules, which was prepared in collaboration with the University of Chemical Technology in Prague and Apigenex s.r.o., and 2 national patents: No. CZ 309268: Method for determining the immune response of poultry after vaccination with a live attenuated vaccine, and No. CZ 309378: Probiotic preparation for poultry and its use.

Within the project OP RDE CZ.02.1.01/0.0/0.0/16_019/0000869 Sustainable production of healthy fish in different aquaculture systems- PROFISH, an international PCT application entitled „Expression vector for production of recombinant proteins in prokaryotic host

cells“ was prepared and submitted in 2022. This PCT application was assigned the file number PCT/CZ2022/050100. One of the main objectives of the CTT PS in 2022 was to strengthen collaboration with representatives of the professional public and the application sphere in the field of agriculture and veterinary medicine, and with other potential customers of research results and knowledge. New collaborations have been established with the commercial and public sphere in the form of applied research projects and expert activities with the aim of a long-term mutually beneficial impact.

In compliance with the strategic objectives of the proposal Institute, a project application was prepared for the second call from National Centres of Competence announced by the Technology Agency of the Czech Republic in 2022. The project, entitled the National Centre for Biotechnology in Veterinary Medicine (NaCeBiVet), which was selected for funding, is intended to enable faster transfer of ideas from the laboratory to end users. An essential requirement is to align research capacities with practical applications, connect excellence in research with emerging technological trends, and generate novel or highly innovative outcomes and thus offer partner companies the opportunity for growth.

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, departmental 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/>).

At the end of 2022, the Institute prepared and published a shared publication of research institutes in the Czech Republic entitled: African swine fever – Research results in the Czech Republic, which summarizes knowledge about this disease, the causative virus, the possibilities of diagnosis and prevention.

In 2022, 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. 16.5 mil. CZK. These collaborations were accomplished in the form of licencing agreements, agreements for contract research and custom research.

Certified methodologies

Title of the applied result	Authors
Methodological procedure for the analysis of wastewater for the presence of specific regions of the SARS-CoV-2 genome	VAŠÍČKOVÁ, Petra, HRDÝ, Jakub, KRÁSNA, Magdaléna.
Detection of honey bee viruses in the environment: Methodological procedure for the detection of the presence of Deformed wing virus RNA obtained from hive debris by RT-(q)PCR	PRODĚLALOVÁ, Jana, MOUTELÍKOVÁ, Romana, ČUKANOVÁ, Eliška.
Recommended procedures for the diagnosis, antibiotic treatment and prevention of diseases in pigs caused by <i>Streptococcus suis</i>	NEDBALCOVÁ, Kateřina, KUCHAROVIČOVÁ, Ivana, ZOUHAROVÁ, Monika.
Innovation of embryo production from oocytes obtained by the ovum pick up method	MACHATKOVÁ, Marie, TRÁVNÍČKOVÁ, Ivona, HULÍNSKÁ, Pavlína.
A screening method based on the identification of changes in the porcine internal organ proteome to detect potentially positive animals after administration of banned anabolic steroid hormones	GEBAUER, Jan, ŠŤASTNÝ, Kamil.
Methodology for the identification of missing genetic resources in collections of microorganisms and strategies to fill the identified gaps	KOMÍNEK, Petr, KOMÍNKOVÁ, Marcela, KŘÍŽKOVÁ, Iva.

Software

Title of the applied result	Authors
Comparison of morbidity in cows and calves	HÁJEK, Michal, FLEISCHER, Petr, ŠLOSÁRKOVÁ, Soňa, et al.

Functional patterns

Title of the applied result	Authors
Experimental vaccine against <i>Streptococcus suis</i> infection in pigs	KRÁLOVÁ, Natálie, GEBAUER, Jan, NOREK, Adam, et al.
Inactivated vaccine for vaccination of dogs against tick-borne encephalitis	HUŇADY, Milan, STŘELCOVÁ, Lucie, SALÁT, Jiří.
Carboxymethylcellulose hydrogel enriched with the enzyme lysostaphin exhibiting antimicrobial activity against methicillin-resistant <i>Staphylococcus aureus</i>	KOBZOVÁ, Šárka, KACVINSKÁ, Katarína, VACEK, Lukáš, et al.
Methodological procedure for multiplex detection of faecal contamination indicators taking into account the occurrence of pathogenic agents of viral origin	KRÁSNA, Magdaléna, HRDÝ, Jakub, VAŠÍČKOVÁ, Petra.
Multiplex system for the determination of selected Protozoa members in the young of small ruminants by MOL-PCR	MARKOVÁ, Jiřina, RESLOVÁ, Nikol, HUVAROVÁ, Veronika.
Food product of daily use with hepatoprotective effect	RYŠÁVKA, Petr, NOVOTNÁ, Krystyna, NETUŠIL, Radek, HANÁČKOVÁ, Markéta, POSPÍŠILOVÁ, Eva, KOHOUTOVÁ LÁNOVÁ, Martina, FALDYNA, Martin, JEKLOVÁ, Edita, LEVÁ, Lenka.
Probiotic strains with strong hepatoprotective potential	HANÁČKOVÁ, Markéta, KONEČNÁ, Jana, NETUŠIL, Radek, NOVOTNÁ, Krystyna, POSPÍŠILOVÁ, Eva, RYŠÁVKA, Petr, FALDYNA, Martin, JEKLOVÁ, Edita, LEVÁ, Lenka.
Kit for the determination of minimum inhibitory concentrations of monitored antibiotics for <i>Escherichia coli</i>	NEDBALCOVÁ, Kateřina, ZOUHAROVÁ, Monika, MATIAŠKOVÁ, Katarína.
xMap panel for detection of selected pathogens in animal matrix	ZALEWSKA, Barbora, NESVADBOVÁ, Michaela, HULÁNKOVÁ, Radka.

Verified technology

Title of the applied result	Authors
Preparation of the mutant enzyme LYSSTAPH T2 from plasmid DNA	JANDA, Lubomír, KOBZOVÁ, Šárka, NOREK, Adam, VACEK, Lukáš
Preparation of lyophilized biopolymer foams enriched with the enzymatic LYSSTAPH T2	JANDA, Lubomír, KOBZOVÁ, Šárka, et al.

Utility model

Title of the applied result	Authors
Complex probiotic preparation from anaerobes of the digestive tract for poultry	RYCHLÍK, Ivan, FALDYNOVÁ, Marcela, VOLF, Jiří, et al.
Oligonucleotides for MOL-PCR detection of yeast and Prototheca infections	BAČOVÁ, Romana, MORÁVKOVÁ, Monika.
Probiotic mixture for newborn piglets	RYCHLÍK, Ivan, FALDYNOVÁ, Marcela, VOLF, Jiří, et al.
Preparation for increasing the adsorption capacity of litter	FALDYNA, Martin, LEVÁ, Lenka, SMRŽOVÁ, Zora.
Thermostable endolysin and coding sequence	JANDA, Lubomír, KOBZOVÁ, Šárka, VACEK, Lukáš.
Veterinary medicinal product based on amoxicillin and clavulanic acid for poultry	ŠŤASTNÝ, Kamil, NEDBALCOVÁ, Kateřina, ZOUHAROVÁ, Monika, et al.
Veterinary medicinal product based on trimethoprim and sulfamethoxazole for poultry	ŠŤASTNÝ, Kamil, NEDBALCOVÁ, Kateřina, ZOUHAROVÁ, Monika.

Patent

Applied result No.	Title of the applied result	Authors
United States of America. Patent file, US 11492327 B2	Aminoxy lipids for the construction of self-assembling liposomal systems enabling their subsequent modification by biologically functional molecules	LEDVINA, Miroslav, EFFENBERG, Roman, TURÁNEK, Jaroslav.
Patent file, CZ 309378 B6	Probiotic preparation for poultry and its use	RYCHLÍK, Ivan, FALDYNOVÁ, Marcela, KUBASOVÁ, Tereza.
Patent file, CZ 309268 B6	Method for determining the immune response of poultry after vaccination with a live attenuated vaccine	RYCHLÍK, Ivan, VOLF, Jiří, ŠEBKOVÁ, Alena.

Incidental Institutional Activities

MG Malá galerie

Small Art Gallery

In 2022, our Small Art Gallery hosted 8 exhibitions of photographs, graphic arts, woodcuts, paintings, etc. Some artists organized private viewing to their exhibitions.

- ☉ **Jan Mikolášek** - Marathon of Music 2021, photographs
- ☉ **Yvona Nováková** - In such a lovely companion, graphic art
- ☉ **International Dance Day** - Flamenco for everyone, photographs
- ☉ **Eva Rémišová** - Zodiac, Digital drawing
- ☉ **Luděk Eyer and Jana Špačková** - Colour harmony, Oil and Pastel painting

- ☉ **Romana Vaďurová** - Colour transformations, Painting on silk, printing from Gelli plate, batik, linocut stamps
- ☉ **Lucie Pokludová** - The world of vintage cars and elegance not only of cars and ladies, photographs
- ☉ **Michal Bartoš** - The year in the village, photographs

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/>



Library

In 2022, the Library continuously updated its book fund and magazine fund, purchased books and periodicals, and provided bibliographic and library services, including book lending and providing papers published in journals from its own fund, as well as from other Czech libraries and from abroad. Besides that, it fulfilled the requirements of the Interlibrary loan services for other libraries in the Czech Republic. As well as in previous years, the online access to full-texts of requested papers in 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.

In addition to professional literature, the VRI Library also provides lending of fiction books within the Employees' Library. <https://knihovna.vri.cz/>

Annual Employees' Day again after two years

On 23 June, 2022, the VRI employees and their families could again gather informally and engage in conversation while enjoying recorded and live music.

At the same time, the grounds of the Institute transformed into one large playground, with children racing on scooters, testing their skills with a floorball hockey stick or throwing a ball, jumping in a bouncy castle,

getting their faces painted like colourful butterflies and painting on the road... The programme also included a demonstration by the Guide Dog School. The children could try walking with a white cane and blindfolded.

With good weather and refreshments, there is nothing more to say than that it was a success.



The first children's educational suburban camp at the VRI

On 26 and 27 October 2022, suburban camp, hosted by the VRI with support of the Ministry of Agriculture, took place for the first time. The event was attended by a total of 21 children whose parents or grandparents are VRI employees. The theme of the first edition of the camp was agriculture and autumn, fitting with the autumn holidays and the camp's timing. The children were briefly introduced to the work of our researchers. At interesting stations, they learned about the operation and functioning of our Institute through interactive games, quizzes, and entertaining demonstrations. They had the opportunity to discover and observe the experiments through a microscope, learn how to properly care for animals and understand the needs of animals during this season. All camp participants could view fish tanks and see how the fish are cared for. They also completed a discovery quiz in our fish facility. A great experience was the tour of the School Farm in Žabčice, which is an organizational part of Mendel University in Brno, including a demonstration of farming and care for farm animals.

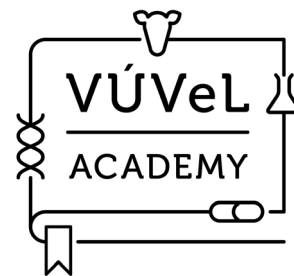


VRI ACADEMY

After the challenges posed by the covid-19 pandemic, the Veterinary Research Institute in Brno fully resumed hosting of in person-seminars and workshops in 2022, under the name "VRI ACADEMY" and also arranged other educational meetings. The events were primarily organised under the Rural Development Programme (9th cycle) project and under the Czech Technology Platform for Agriculture, of which the VRI is a member, and received financial support from the Ministry of Agriculture. Seminars, workshops and one webinar were designed for professionals in the field of agricultural production on farms, veterinary medicine, beekeeping and food industry. Their aim was to provide the professional audience with the transfer of new research findings into livestock industry and veterinary practice. In the seminars, researchers from the VRI in Brno as well as from allied research and other professional institutions delivered their lectures. A total of 10 seminars/workshops and 1 webinar were held during the past year. The seminars proved highly popular among professionals. Participants included livestock breeders, veterinarians and human health practitioners, university students, representatives from nutrition and food processing plants and services in agriculture, state institutes,

and professionals from various scientific institutions. The transmission of information was carried out by subject matter experts, free from commercial interests. The outcome of most events was the publication of proceedings, which are available on the Institute's website (www.vri.cz, under the Collaboration with practice tab/ in the sections VRI ACADEMY and CTPZ). The VRI ACADEMY is organized by

Doc. MVDr. Soňa Šlosárková, Ph.D., who also presented the results of her scientific work in several seminars. Besides her, the following VRI staff actively participated in the above-mentioned seminars: MVDr. Věra Fichtelová, Ph.D., MVDr. Kamil Kovařík, Ph.D., MVDr. Petr Fleischer, Ph.D., MVDr. Jan Bernardy, Ph.D., Doc. RNDr. Ivan Rychlík, Ph.D., MVDr. Ján Matiašovic, Ph.D., Mgr. Zuzana Úlehlová, Ing. Kateřina Matějčíková, Ph.D., MVDr. Jiřina Marková, Ph.D., Barbora Zalewska, MSc., Ph.D., RNDr. Jana Prodělalová, Ph.D., Mgr. Eliška Čukanová and RNDr. Lubomír Janda, Ph.D.



VRI ACADEMY and other professional and educational events

Event title	Event Guarantor	Event date
Paratuberculosis in dairy cattle, epidemiological situation, diagnostics, certification of herds	Doc. MVDr. Soňa Šlosárková, Ph.D.	30 March 2022
Electronic health data recording in the Diary of Diseases and Treatment- an aid for breeding, administration and cattle health management	Doc. MVDr. Soňa Šlosárková, Ph.D.	6 April 2022
Ban on ZnO use and diarrhoeal disease management in piglets and fattening pigs	Doc. MVDr. Soňa Šlosárková, Ph.D.	27 April 2022
Mastitis in dairy cattle, modern diagnostic procedures and future treatment in compliance with the new veterinary regulations	Doc. MVDr. Soňa Šlosárková, Ph.D.	4 May 2022
Fish health	Doc. MVDr. Soňa Šlosárková, Ph.D.	25 May 2022
Molecular detection of pathogens in food and water	doc. MVDr. Soňa Šlosárková, Ph.D.	14 June 2022
Care of the musculoskeletal system of cattle	Doc. MVDr. Soňa Šlosárková, Ph.D.	20 October 2022
Important aspects for maintaining health in sheep and goat herds	Doc. MVDr. Soňa Šlosárková, Ph.D.	5 November 2022
Bee health at risk	Doc. MVDr. Soňa Šlosárková, Ph.D.	10 November 2022
<i>Staphylococcus aureus</i> as a causative agent of infectious skin and soft tissue complications: current and future therapeutic options	RNDr. Lubormír Janda, Ph.D.	15 December 2022
Correct function of chicken intestinal tract	Doc. MVDr. Ivan Rychlík, Ph.D.	22 March 2022
Innovations in Poultry Medicine – correct function of chicken intestine	Doc. MVDr. Ivan Rychlík, Ph.D.	23 May 2022
Comprehensive mastitis control in automated milking systems	Doc. MVDr. Soňa Šlosárková, Ph.D.	23 August 2022



Open House 2022

We were delighted by the interest of attendees in the 5th annual Urban architecture festival OPEN HOUSE 2022 at our Institute. The Director of the VRI, Dr. Martin Faldyna, first introduced the visitors to the history and present of the Institute. This was followed by a tour of selected interesting architectural elements - the entrance foyer of the main building, including the Small Art Gallery. While the Gallery may be small in size, it boasts a rich tradition and hosts numerous exhibitions by renown artists. Mrs. Zdenka Gregorová from the Department of Informatics of the VRI provided a special commentary on the building history and architecture, including the library with its unique spiral staircase. Subsequently, the attendees went down to the nuclear bunker, which is an integral part of the building. Then, the Director Dr. Faldyna showed the visitors the newest building. Due to the infectious environment, visitors could not see the laboratories there, but they could enjoy an unusual view of the Medláňky district from the fourth floor.



Christmas Fair held at the VRI to help the “Crossroad” Foundation

The initial Christmas Fair was held on St. Nicholas’ Day at the VRI, and we hope it will be the first of many to come. Numerous employees actively participated, serving as “vendors” of a delightful array of items at the Fair, while others as “buyers” seized the opportunity to contribute to a noble cause through their purchases. The highlight of the event was that every buyer had the autonomy to determine their own price, allowing them to choose the amount they wished to contribute to the VRI charity fund.

The aim of the event was to support the Crossroad Foundation, with the donations intended for the acquisition of baby breathing monitors. The fundraising campaign extended through the end of the year, resulting in a commendable total of 15,635 CZK collected. Thanks to the VRI Christmas Fair, this sum will provide monitoring for six babies, ensuring their peaceful sleep.



VRI and the CHARITY

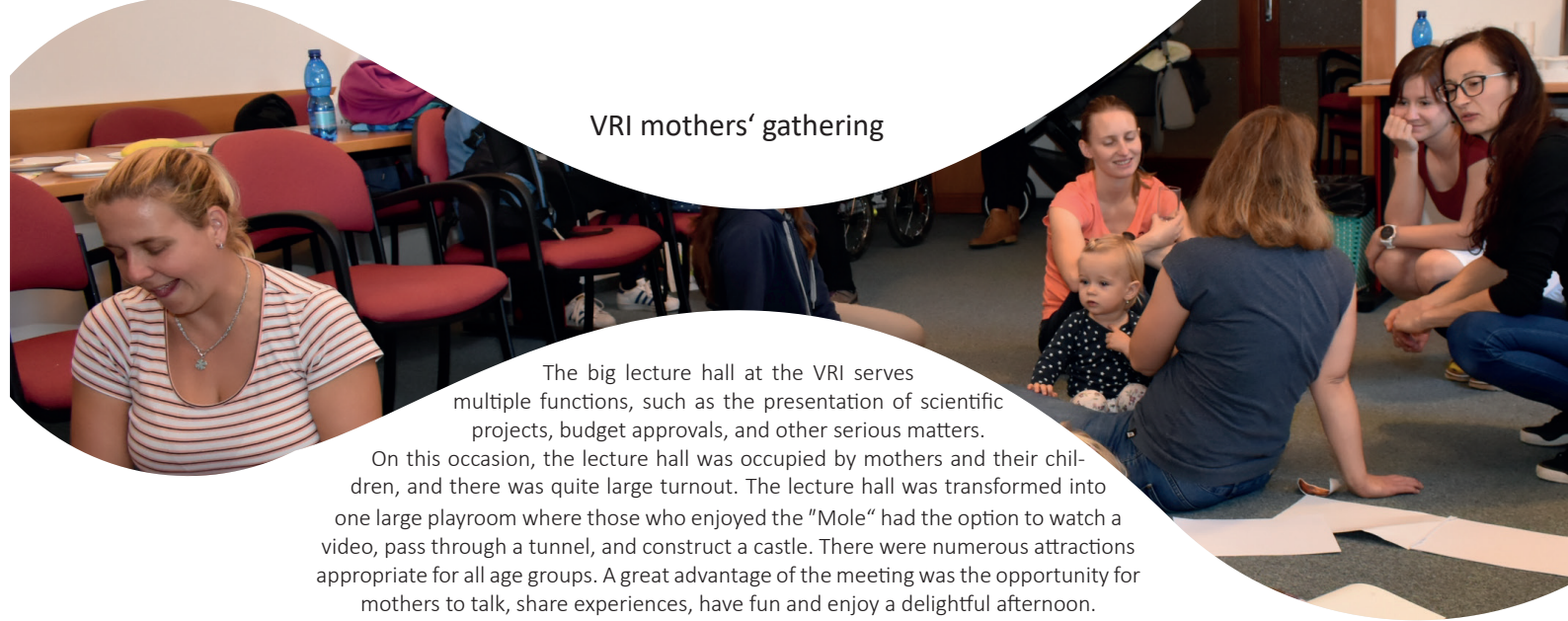
The winter months can be particularly challenging for homeless people. In collaboration with the Diocesan Charity of Brno, we initiated a collection campaign for those living on the streets titled “Socks for the Homeless”. Over the course of two months, the staff collected enough good-quality donations to fill two pallets with items such as clothes, tents, and bags...

The Institute was visited by Mgr. Petr Šimon, DiS., Head of the Services for Homeless People from the Diocesan Charity Brno- Services Brno. According to him, the collection was highly beneficial, enabling many homeless people endure the winter with warmth and dignity. We have agreed to continue our collaboration, redirecting our collection efforts to support the Charity’s food bank. The donated non-perishable food primarily went to refugees from war-affected Ukraine.

At the Veterinary Research Institute, science is conducted at a high level, and on top of that, employees are generous and willing to help others. This is why they deserve our gratitude and great admiration!



VRI mothers' gathering



The big lecture hall at the VRI serves multiple functions, such as the presentation of scientific projects, budget approvals, and other serious matters.

On this occasion, the lecture hall was occupied by mothers and their children, and there was quite large turnout. The lecture hall was transformed into one large playroom where those who enjoyed the "Mole" had the option to watch a video, pass through a tunnel, and construct a castle. There were numerous attractions appropriate for all age groups. A great advantage of the meeting was the opportunity for mothers to talk, share experiences, have fun and enjoy a delightful afternoon.

"The mothers' gathering was one of the most enjoyable events I have had the privilege to organise in my career as an HR manager. The youngest participant was only 5 weeks old! We extend our sincere gratitude to all the mothers and children who visited the VRI to have fun and play. I wish everyone good health and I anticipate our reunion next year when we catch up on how fast the children are growing," said Jana Křížová, the organiser of the event.

VRI Photography Competition

Prior to the holidays following the school year 2021/2022, the "VRI Photography Competition" was announced for employees with submissions categorized into 3 groups - "Landscape of my heart", "Portrait of my neighbour", "Nature is paradise". A total of 121 photos were submitted to the competition. Subsequently, selected photos could be seen on display and we voted for the best photo in each category.



Additional activities

Veterinary Committee for Food Safety in 2022

The professional activity of the Committee members and external experts, invited to assist in performing the tasks, was concentrated on making studies and giving opinions focused on the issues closely related to animal health, animal welfare, zoonoses, hygiene of farms, safety of animal products and animal feeds.

Members of the Committee in 2022:

Chairperson of the Committee: RNDr. Miroslav Machala, CSc. (VRI)
Secretary of the Committee: MVDr. Ivana Koláčková, Ph.D. (MU Brno) was replaced later in the year by Mgr. Pavlína Šimečková, Ph.D. (VRI)

Members:

MVDr. Pavel Alexa, CSc. (VRI, former employee), Doc. MVDr. Jan Baradoň, Ph.D. (SVI Olomouc), Prof. Ing. Petr Doležal, CSc. (MENDELU), Prof. MVDr. Alfred 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. (VRI), Mgr. Petra Vašíčková, Ph.D. (VRI/Elisabeth Pharmacon), Prof. MVDr. Vladimír Večerek, CSc. (VETUNI), Prof. MVDr. Lenka Vorlová, Ph.D. (VETUNI)

Professional activity of the Committee

Professional activity of the Committee focused mainly on processing of four scientific studies:

1. Verification of the anti-inflammatory efficacy of silver moss (*Potentilla argentea*) extract (Prof. Hera et al.)
2. Prevalence and properties of *Klebsiella pneumoniae* sensu stricto in foods of plant origin retailed in the Czech Republic (Doc. Karpíšková et al.)
3. Susceptibility of *Corynebacterium pseudotuberculosis* to selected antimicrobial agents (Dr. Langová et al.)
4. Occurrence of selected parasitic and viral agents in seafood and fish retailed in the Czech Republic (Dr. Zalewska et al.).

The Chairperson of the Committee actively participated in the work of EFSA within the Emerging Risks Exchange Network (EREN) panel.



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

Testing for mycobacterial infections in animals; detection of the etiological agents of paratuberculosis, avian tuberculosis and the other mycobacterial infections; detection of the presence of specific DNA sequences by PCR; detection of human noroviruses, hepatitis A and E viruses.

03- Laboratory for *E. coli* infections

Detection of Shiga-toxicogenic *Escherichia coli* (ISO/TS 13136); typing of *E. coli* somatic antigen; detection of Shiga toxins, adherence factor intimin, enterohemolysin, enterotoxins and differentiation of stx2e.

05 - Laboratory for Electron Microscopy

Detection of viruses using negative staining.

06 - Laboratory for Viral Diseases of Fish

Isolation of fish viral pathogens on cell lines; detection of viral fish pathogens by ELISA; determination of the presence of selected DNA and RNA sequences in fish viruses.

07- Laboratory for Spermatology and Andrology

Semen analysis; determination of the functions of male

reproductive organs; biological safety testing of various materials for sperm.

08 - Laboratory for Viral Diseases of Cattle

Bovine viral diarrhoea (BVD) and infectious bovine rhinotracheitis (IBR) – detection of the viruses and antibodies by ELISA.

09 - Laboratory for Typing of Bacteria

Detection of *Listeria monocytogenes* (EN ISO 11290), *Salmonella* spp. (ČSN EN ISO 6579) and *Campylobacter* spp.; detection of *Staphylococcus aureus* by PCR; serotyping of *Listeria monocytogenes* and *Salmonella* spp.; phage typing of *Salmonella*; macro-restriction analysis of bacteria by PFGE.

Identifying Data

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

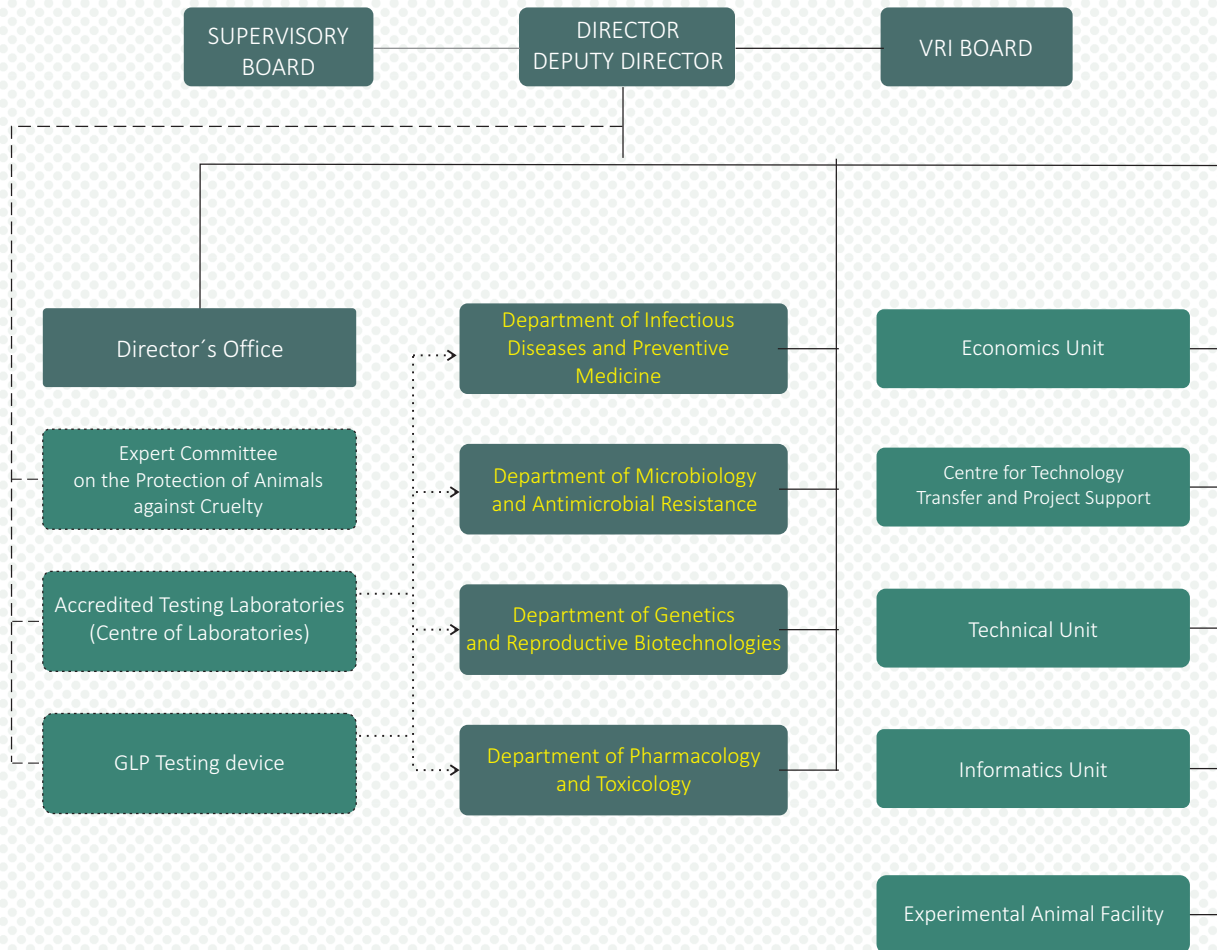
GPS Loc: 49°23'28"N, 16°57'48"E

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>

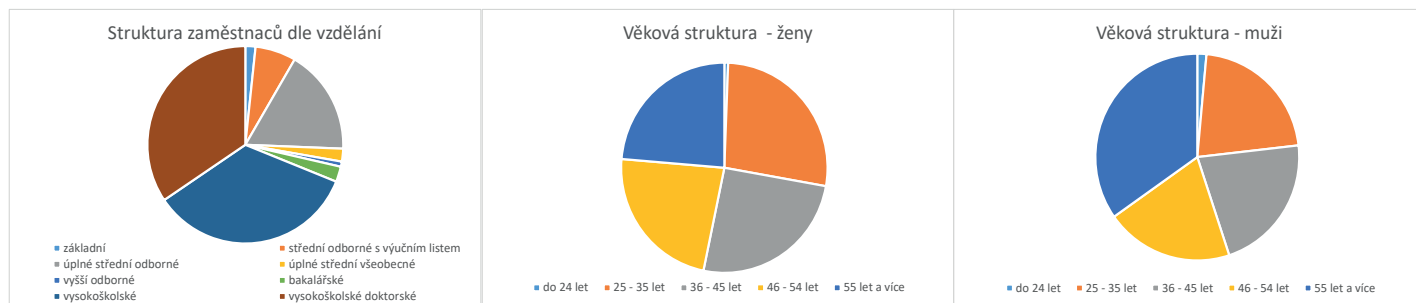
VETERINARY RESEARCH INSTITUTE



BASIC PERSONNEL DATA

The average gross monthly salary of VRI employees in 2022 was CZK 42,779. When compared with the previous year, this represents an increase of CZK 2,349 per month, which means that its year-over-year growth rate was 5.81%. The national average for 4.Q 2022, published on the Czech Republic's Statistical Office website on 6th March, 2023, was CZK 43,412. The average gross salary indicator is calculated as the arithmetic mean (this is not the salary of one employee) and includes bonuses, salary compensation and overtime paid to FTE employees. Gross salaries are

paid net of income tax, statutory health and social security contributions, and any other deductions agreed with individual employees. After deducting all these contributions, the employee is paid net salary. Neither compensation nor other personal costs were included in the calculation of the average gross salary, i.e. the costs paid on the basis of non-employment agreements (work agreements) and bonuses paid to statutory bodies.



Long-term conceptual development of the research organization for 2018 – 2022

Decision number MZE-RO 0518 Investigator: MVDr. Martin Faldyna, Ph.D. The year 2022 was the fifth, i.e. the last year of the VRI institutional support project entitled "Long-term conceptual development of the research organization for 2018 – 2022,". The project was designed and approved in 2017 in accordance with the Concept of Research, Development and Innovation of the Ministry of Agriculture for 2016-2022 and the Strategy of the Ministry of Agriculture of the Czech Republic with a view to 2030.

In 2017, while the DKRVO project was under preparation, the sustainability period for projects within the R&D&I operational programmes AdmiVet (Centre for Advanced Microbiology and Immunology in Veterinary Medicine) and CEITEC (Central European Institute of Technology) was still ongoing, and the implementation phase of the project of the operational R&D&I programme FIT (Pharmacology, Immunotherapy and NanoToxicology) was commenced. In that period, additional projects from the same operational programme were launched, such as Immunopharmacotherapy, Centre for Recombinant Biotechnologies and Immunotherapeutics (CEREBIT), Healthy ageing in Industrial Environment (HAIE), Probiotic Bacteria of Gut Microbiota as the Basis of Animal Health and Welfare, and Sustainable Production of Healthy Fish in Different Aquaculture Systems (PROFISH). These large infrastructure projects, along with institutional funding and special-purpose support projects from various

providers, allowed the DKRVO objectives to be successfully achieved, as defined in 2017.

Although the course of the 2018-2022 DKRVO implementation was adversely affected by two global events - the Covid-19 pandemic and the war in Ukraine with the political and economic consequences - it was possible to state that all indicators were met and in most cases exceeded the planned values. For example, the Institute's staff were authors or co-authors of 384 publications in journals with impact factor above the median of the branches. In fact, this is one and a half times the planned value. Furthermore, 14 patents were granted instead of the planned total of four. The count of other applied results achieved 218, surpassing the planned quantity by more than two and a half times. Some of the scientific work results were also presented to veterinary practitioners and farmers in the form of publications in specialized journals intended for the readers in this field. These figures documented that the funds allocated for the institutional support of the Veterinary Research Institute were effectively used in accordance with their intended purpose, playing a pivotal role in achieving the Institute's mission: "Contribute to the sustainable development of livestock production through scientific research work and subsequent transfer of technology and knowledge".

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 (58809/2014-MZE17214, valid until 22 March 2020). The goal is to create best conditions for experiments of the highest quality, corresponding to international standards with applying high ethical standards. 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, dogs, cats, rabbits, chickens, guinea pigs, rats, hamsters, mice and fish.

10 projects proposals dealing with the following areas were submi-

tted for approval: Basic research, translational or applied research, development, production or testing of the quality, efficacy and safety of pharmaceuticals, foods, feeds and other substances or products, and in the field of higher education or doctoral study in order to obtain, maintain or improve professional knowledge. The experiments were carried out under the projects funded by the Czech Research Council (AZV), National Agency for Agricultural Research (NAZV), Czech Science Foundation (GAČR), Technology Agency of the Czech Republic (TACR) and the Operational Programme Research, Development and Education (OP RDE).

AGRICULTURAL ACTIVITIES

Part of the VRI agricultural area is designed for farm animal evacuation in case of fire or other emergency events. This area is inevitable and conforms to the current legislation.

THE VRI AUTHORITIES

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

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 Kovařík, 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. Lubomír Pojezdal, Ph.D.	Member	VRI
MVDr. Markéta Reichelová	Member	VRI
doc. RNDr. Ivan Rychlík, Ph.D.	Member	VRI
MVDr. Jiří Bureš	External member	State Control of Veterinary Biologicals and Medicines
Doc. Dr. Ing. Josef Kučera	External member	Czech-Moravian Breeders Association, a.s. PGRLF
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

MEMBERS OF THE SUPERVISORY BOARD

Member's name	Function	Organisation
Doc. MVDr. Milan Malena, Ph.D.	Chairperson	
Mgr. Tomáš Jírů	Deputy-Chairperson	Regional Veterinary Administration for Pardubice Region (28 May 2019 – 28 May 2024)
Mgr. Jaroslav Hejátko	Member	Ministry of Agriculture (1 May 2019 – 1 May 2024)
Ing. Ondřej Sirko	Member	Ministry of Agriculture (27 May 2021 – 27 May 2026)
MVDr. Martin Beňka	Member	State Veterinary Administration (7 December 2017 – 7 December 2022)
Ing. Jan Vodička	Member	Ministerstvo zemědělství (27 May 2021 – 27 May 2026)
Prof. MVDr. Alfred Hera, CSc.	Member	State Control of Veterinary Biologicals and Medicines (13 November 2020 – 13 November 2025)

DIRECTOR'S BOARD

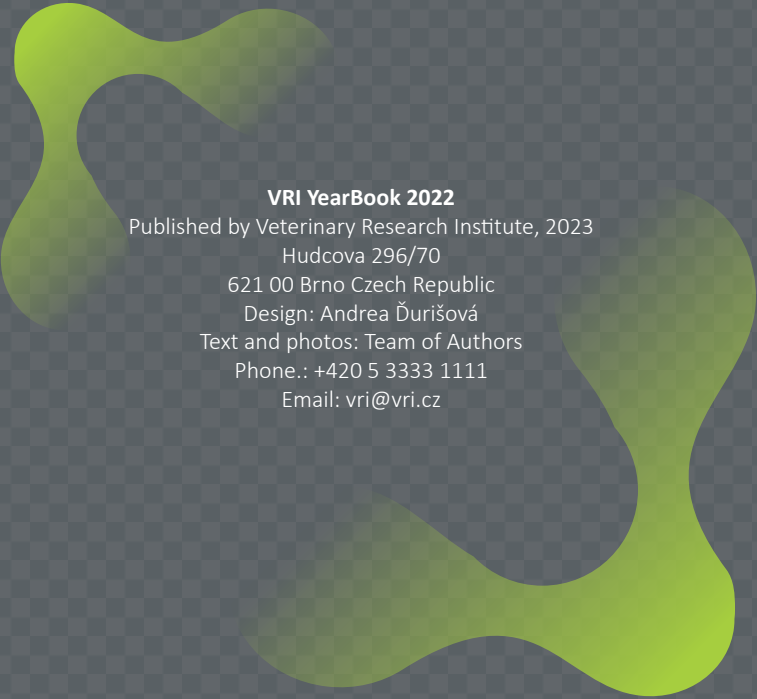
Member's name	Department
MVDr. Ján Matiašovic, Ph.D.	Department of Infectious Diseases and Preventive Medicine
doc. RNDr. Ivan Rychlík, Ph.D.	Department of Microbiology and Antimicrobial Resistance
doc. MVDr. Martin Anger, CSc.	Department of Genetics and Reproductive Biotechnologies
PharmDr. Josef Mašek, 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
Jiří Zemek from 1. 12. 2020 until 30. 11. 2022 Roman Dvořáček from 1. 12. 2022	Informatics Unit
Ing. Martina Ježková from 1. 7. 2021 to 30. 4. 2022 Ing. Jana Satrapová od 1. 6. 2022	Economics Unit
Marie Sobotková	Experimental Animal Facility
Ing. Jiří Svoboda	Technical Unit
Ing. Iva Stránská	Safety Officer
Ing. Jan Rázek Pavla Dvořáková from 14. 7. 1997 until 31. 1. 2022 Renata Nagyová, DiS. from 1. 1. 2022 until 31. 12. 2022 Lenka Janečková from 1. 5. 2022	Director's Office
Mgr. Simona Hošková from 14. 08. 2017 until 28. 2. 2022 Jana Křížová from 1. 2. 2022	HR Officer
Ing. Jiří Kolísek	HR Coordinator
Irena Smrčková, MSc.	Internal Auditor
MVDr. Kateřina Nedbalcová, Ph.D.	Veterinary Trade Union

THE ACTIVITIES OF THE VRI BOARD IN 2022

In 2022, four regular meetings were held by the VRI Board. The meetings included formal acts related to the running of the institution: The VRI Board members approved the Institute's budget for 2023 and the Annual Report of the Institute for 2022. At the meeting in January, the VRI Board convened with a new composition following the elections at the end of 2021. Dr. Prodělalová was elected as the VRI Board Chairperson, and Dr. Matiašovic as the VRI Board Deputy-Chairperson. Furthermore, the Board members discussed and approved changes to the Bonus Rules, Career Development Policy, and the Rating System for the evaluation of working groups. During the year, project proposals submitted in response to open calls from various providers were discussed. At the meeting in November, the Director reported on the VRI activities in 2022.





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