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**Federal Food Safety and
Veterinary Office FSVO**
Research Management

FSVO Research Commission

Federal Food Safety and Veterinary Office Research Concept FSVO 2021–2024

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Management Summary

The Federal Food Safety and Veterinary Office (FSVO) Research Concept provides information on the intended direction of research for the period 2021 to 2024. A large number of scientific topics and questions have been defined, either specific to the FSVO's fields of activity or extending across multiple fields or federal offices. This document also looks back at the programme for 2017 to 2020 and the ways in which its targets were achieved.

The Concept sets out the financial framework for FSVO research and also describes the main players in this research and their roles. Key national and international partners are highlighted.

Finally, the Concept outlines the research process within the FSVO, including project selection, quality assurance, implementation and communication.

1 Introduction

Federal Administration research ("government research") can cover virtually every form of scientific research, but most frequently concerns application-oriented research. Federal Administration research is based on clear legal foundations. In addition to Article 64 of the Federal Constitution ([SR 101](#)), its governing framework law is the Research and Innovation Promotion Act (RIPA, [SR 420.1](#)).

Government research essentially fulfils the following functions:

1. It serves as a policy instrument by generating information for action and guidance and providing potential solutions to current issues of political relevance;
2. It provides an instrument for prospective identification of problems and issues, and recommends suitable measures to resolve them;
3. It helps the state to define its strategic orientation and position;
4. It provides a basis of legitimacy for state action by scientifically verifying the appropriateness of such action.

The FSVO bases its decisions, laws and regulations on scientific principles. For these bases it needs research in all its fields of activity: animal health, animal welfare, food safety, nutrition and protection of species in international trade.

The first prerequisite for successful government research is strategic thinking on the part of government departments, in order to identify those areas where research can find answers to societal questions within politically justifiable time-frames; see Section 2.

The second prerequisite is professional research management, which includes measures for knowledge dissemination and transfer through to practice; see Section 6.1.

The third and final prerequisite is the creation of framework conditions that ensure the scientific quality of government research; see Section 6.2.

2 FSVO, at the centre of the policy areas of health, agriculture and environment

The FSVO actively promotes the health and welfare of humans and animals. In order to achieve this strategic objective and find answers to the relevant questions for its tasks, the FSVO both conducts its own research and also commissions research projects. As the Office responsible for food safety, nutrition, animal health, animal welfare and species conservation in international trade, the FSVO's area of activity covers the entire food chain from welfare-friendly animal production to finished food product and also extends to nutrition.

The FSVO Research Concept is aimed mainly at professionals and researchers working in its area of activity, but is also addressed to the FSVO's stakeholders. It gives an overview of the research priorities that the FSVO has defined for the next four years. FSVO research is guided by the knowledge gaps and needs of its specialist departments and, as far as possible, also takes into account the

needs of the FSVO's main stakeholders. The results of FSVO government research are incorporated into its risk assessment, risk management and risk communication activities. Research results can also serve as a basis for further application-oriented research projects.

Government research within the FSVO focuses primarily on the policy areas of agriculture and health and, to a lesser extent, environment. Another important research area is that of animal welfare, which includes supporting the [Swiss 3R Competence Centre](#). The FSVO's close cooperation with the Federal Office for Agriculture (FOAG), the Federal Office of Public Health (FOPH) and the Federal Office for the Environment (FOEN) is also evidenced by the fact that they incorporate FSVO research priorities into their own research concepts. In addition, the close links between relevant questions in each policy area are expressed in overarching specific strategies spanning multiple Offices and the resulting research collaborations. Effective coordination of research questions is therefore essential.

2.1 Strategic orientation of research within FSVO

The FSVO's field of activity extends across the bulk of the food chain. The specialist strategies¹ and processes developed in areas such as food safety, nutrition and animal welfare have an impact on human and animal health and on the environment. To develop broad-based answers to complex questions, collaboration with the FOPH, FOAG and FOEN is particularly important. These Offices are key partners in interdepartmental strategies such as the [Food Chain Strategy](#), [NCD² Strategy](#), [Strategy on Antibiotic Resistance Switzerland](#) (StAR) and [Swiss Nutrition Policy](#).

2.2 Review of the period 2017–2020

Table 1 gives an overview of the distribution of expenditure per year. A total of CHF 17 million was invested in research projects between 1 January 2017 and the end of 2020. The vast majority of projects are research mandates and the proportion of grant funding is approximately 11%, most of which was invested in grants to the 3R Competence Centre³.

Table 1: FSVO projects in the period 2017–2020 (in CHF 1'000)

Jahr	2017	2018	2019	2020
Research mandates (extramuros)	3'084	3'472	3'295	3'322
Grants	123	583	448	627
Intramuros Research	309	592	448	449
Total/year	3'516	4'647	4'191	4'398

The priority research objectives for 2017–2020 for which projects have been carried out are shown in Table 2. The right-hand column lists the corresponding projects carried out under each topic, allowing the implementation of the research programme to be verified. The project numbers are linked to the Aramis database.

¹ [Animal Health Strategy, Nutrition Policy](#)

² NCD: non-communicable diseases (e.g. cardiovascular diseases, cancer, diabetes, musculoskeletal diseases, chronic respiratory diseases)

³ <https://www.swiss3rcc.org/en/>

Table 2: projects performed on the priority research objectives for 2017–2020

Topics	Projects (Aramis numbers)
Food safety	
Determining human and animal exposure to natural ingredients of foods and commodities with potential health relevance	<u>4.17.06</u> , <u>4.17.05</u> , <u>17AA</u> , <u>17MTAR</u> , <u>4.18.03</u>
Reviewing/improving statistical evaluations of animal studies; dose/response relationships depending on study design	none
Contributing to the development of an evaluation plan in the event of simultaneous exposure to multiple substances	<u>4.17.01</u> , <u>4.20.02</u>
Developing methods for characterising and measuring the uptake of chemical substances from packaging materials	<u>4.20.02</u>
Determining the viability of pathogenic micro-organisms, in particular viruses, in foods and in food production processes (e.g. <i>Mycobacterium bovis</i> / <i>caprae</i> in raw milk cheese; hepatitis E virus in meat products)	<u>4.18.01</u> , <u>4.18.02</u> , <u>1.18.05</u>
Developing methods and media for targeted, effective communication in order to effect, promote and support changes in behaviour	<u>6.18.01KOM</u> , <u>4.20.05</u>
Occurrence and frequency of food-borne pathogenic micro-organisms in various foods, with a particular focus on viruses	<u>4.17.02</u> , <u>4.17.03</u> , <u>4.18.03</u> , <u>4.19.01</u>
Determining human and animal exposure to environmental contaminants and other anthropogenic and natural substances via food and commodities	<u>17MTAR</u>
Environmental monitoring (e.g. water) and human biomonitoring (e.g. serum, urine) to determine the exposure of the Swiss population to heavy metals (cadmium, arsenic, uranium, etc.) and other (organic) contaminants	<u>4.20.03</u>
Nutrition	
Collecting representative data on food consumption and nutritional behaviour	<u>5.17.02ERN</u> , <u>5.19.01</u>
Studies of nutrition-related subsequent costs	<u>5.17.01ERN</u>
Developing and applying cost-effective, precise methods for recording the nutritional and consumption habits of different population groups (e.g. infants, toddlers, migrants)	<u>5.20.01</u>
Animal health and StAR	
Epizootic disease surveillance, early detection, assessment of new hazards and risks, and monitoring of antibiotic resistance and antibiotic use	<u>1.17.03</u> , <u>1.17.09</u> , <u>1.17.10</u> , <u>1.18.01</u> , <u>1.18.09</u> , <u>1.19.04</u>

Topics	Projects (Aramis numbers)
Evaluating animal husbandry and production systems with regard to the prevention of infectious diseases and antibiotic resistance	<u>1.17.06AB, 1.17.07AB, 1.17.08AB, 1.18.10, 1.18.14TG, 1.19.01, 1.19.03</u>
Control of epizootic and zoonotic diseases (research on strategy development, diagnosis and evaluation of control)	<u>1.17.02, 1.17.04, 1.17.05, 1.18.02, 1.18.03, 1.18.04, 1.18.06, 1.18.07, 1.18.08, 1.18.13, 1.19.02, 1.19.05, 1.19.06, 1.19.07, 1.20.01, 1.20.02, 1.20.03</u>
Evaluation of animal husbandry and production systems (e.g. piglet production, calf fattening) and animal trafficking with regard to food safety risks on the one hand and effective prevention of infectious diseases and antibiotic resistance on the other hand	none
Analysis of communication specific to each group of interlocutors; developing communication concepts	<u>6.18.01KOM</u>
Animal welfare	
Developing new methods and improving established methods for recording animal welfare	<u>1.18.14TG, 2.18.03</u>
Optimising anaesthesia and slaughter methods	<u>2.20.02</u>
Assessing the housing conditions of livestock, domestic animals and wild animals	<u>2.19.01,</u>
Impact of new uses, forms of production and technologies on animal welfare (e.g. aquaculture, sports, therapy animals)	<u>2.17.02, 2.17.06, 2.18.02, 2.18.06</u>
Welfare-related aspects in the breeding of animals	<u>2.20.01, 2.17.04, 2.17.05, 2.20.03</u>
Implementation of 3R requirements in animal experiments	<u>2.18.3RCC</u>
New methodological approaches to reinforce the practical implementation of research project findings	<u>6.18.01KOM, 2.18.01</u>
Species protection	
Procurement of information that is crucial for decision-making processes in the context of the conference of parties to the convention.	<u>3.17.01, 3.17.02, 3.17.03, 18SHAH, 3.20.01</u>

A comparison with the research priorities set out in the 2017–2020 concept shows that most of the stated priority objectives have been translated into research projects. Some topics were not addressed, either because the priority was too low or because no project of sufficient quality was submitted. These topics not addressed were:

- Developing low-cost methods and tools to test the effectiveness of contextual and behavioural prevention measures
- Developing new, more sophisticated methods for measuring allergens in foods
- Integrating “-omics” methods into regulations
- Mathematical simulation of substance migration from food contact materials to foodstuffs
- Developing basic principles for assessing the health risks of foreign substances in cosmetic products
- Exploring the possibilities for using new techniques (e.g. next generation sequencing) in the molecular biological testing of food; developing new methods of species determination (animals and plants)
- Evaluating the impact of current and future animal welfare regulations on animal welfare
- Studies on societal trends in human-animal interaction
- Establishing databases that can be used in a One Health context

3 Research priorities for 2021–2024

Long-term planning is increasingly difficult in these fast-moving times, and yet successful research projects call for long-term planning. At the same time, the FSVO must be agile enough to respond to sudden events. We need to master this balancing act. The research priorities set out in Section 3 cover topics that the FSVO considers important in the autumn/winter of 2020 to enable it to fulfil its mission.

Key trends that will shape the coming years include the topics of *climate change*, *digitisation* and *social changes* with repercussions on issues such as the relationship between humans and other species on our planet.

Global warming could have adverse effects on food for humans and animals. Higher temperatures could lead directly to health problems for humans, farm animals and pets. It is important to find innovative solutions now, both to limit the scale of the problem and to adapt to the inevitable changes that lie ahead.

Digitisation is introducing new possibilities in many areas, such as “smart farming”, early detection of disease outbreaks through social network analysis, and whole genome sequencing (WGS) techniques.

Social changes will also have an impact on future research topics. Indeed, consumers are showing a growing interest in animal welfare and are also more aware of the effects that the production system has on the environment. This poses new challenges, notably in terms of breeding methods and husbandry systems, food production systems and traceability.

3.1 Cross-thematic research questions, One Health, StAR

One of the FSVO’s concerns is to exploit opportunities for cooperation with other Offices. In line with the Food Chain Strategy and One Health, research questions in animal health have clear links with other disciplines. The research priorities are strongly influenced by the research needs derived from the Swiss Animal Health Strategy 2010+ and the federal strategy for combating antimicrobial resistance (StAR). These research questions are discussed further in Section 3.6.

3.2 Food safety and nutrition



The basic legal requirement for food is safety. Food is considered unsafe if it is likely to be harmful to health or is unfit for human consumption. Maximum levels are set for the microbiological and chemical safety of foodstuffs. Whether or not a food with a specific composition is health-promoting does not fall under food safety.

Compliance with safety and compliance with nutritional requirements are therefore two key prerequisites for a healthy population. Further efforts are needed to ensure that the FSVO can meet these prerequisites despite global challenges and to ensure that new risks can be continuously regulated.

3.2.1 Research priority: food safety

Foodstuffs, utility articles and consumer products can pose risks to human health, either through natural ingredients and contaminants or through pathogens (e.g. micro-organisms, viruses). Identifying and characterising such risks and determining human exposure forms the basis of comprehensive risk assessment.

Molecular biological analysis of organisms is used to identify and assess food-borne risks. New methods such as whole genome sequencing have been developed in this area; however, the benefits of new plant breeding methods (e.g. genome editing) have yet to be demonstrated. Further development of the analysis and management of resulting data should support the tasks of health protection and fraud prevention.

Animal toxicology studies are used to assess food-borne risks. Analysing the methodology of such studies, namely study design and statistical evaluation, helps to increase their validity.

Early detection of emerging food-borne risks to human health and of possible deception of consumers should be improved through further development of methodology.

Surveys to monitor the nutritional and consumption behaviour of various population groups are the basis for measures to maintain and improve the health status of the population. New methods should be developed to reduce the effort and expense of these surveys.

3.2.2 Research focus: nutrition

A balanced composition of foods and meals is an important basis for a healthy diet. Research projects to improve food and meal composition will therefore be launched and funded.

To obtain representative data on the food consumption of the Swiss population, projects will be funded looking at food consumption, nutritional patterns and lifestyle in the various language regions of Switzerland. To understand the intake of specific nutrients by the population as a whole and by certain risk groups, project topics will include iodine supply, sodium intake and caffeine intake in children and adolescents. Methodological aspects will also be developed, e.g. a semi-quantitative Food Frequency Questionnaire (FFQ) optimised for adults, to be used in nutrition studies in Switzerland. Since health awareness is only one of many factors that influence eating habits, modern nutrition research works closely with other scientific fields such as medicine, genetics, prevention research and psychology. It considers questions such as: What influences buying behaviour? How can nutrition recommendations better reach the population or various target groups? and What helps to put recommendations into practice?

3.2.3 Priority topics for food and nutrition 2021–2024

The table below summarises the research needs in the field of food and nutrition. “Food” means all topics covered by food legislation, including utility articles and consumer products.

Knowledge gaps	Research questions arising from these gaps	Priority
Identifying and characterising natural ingredients and contaminants in food and utility articles, exposure	How high is the exposure to natural ingredients and contaminants from food and utility articles in Switzerland? How are the substances relevant to Switzerland identified?	high
Identifying and characterising pathogens in food and utility articles, exposure	Which pathogenic bacteria, viruses and parasites are present in food and utility articles and with what frequency? What is their health impact, including outbreak potential?	high
Analysing the role of study design on the dose-response relationship and the statistical analysis of animal studies, including the evaluation of -omics data	How can the influence of study design on study outcome be better understood and taken into account? To what extent can certain toxicology studies be conducted without animals? Which	high

Knowledge gaps	Research questions arising from these gaps	Priority
	bases are required for the assessment of -omics data?	
Developing new methods to determine the nutritional and consumption behaviour of different population groups	How can we conduct faster and cheaper surveys of nutritional and consumption behaviour in different population groups?	high
Methods to demonstrate the use of new breeding techniques , e.g. genome editing	What are the possibilities for demonstrating the use of new breeding techniques, e.g. genome editing, in food?	high
Analysis and management of data generated by whole genome sequencing (WGS)	What decisions regarding the use of WGS should be taken by Risk Management?	high
Further development of methods for early detection	How can data from new communication technologies be used?	high
Evaluating the risk from combined exposure to substances	How can the health risk of combined exposure to substances from food, utility articles and the environment be assessed?	moderate
Identifying and characterising packaging materials and exposure	What are the effects on food safety of using new packaging materials, e.g. using recycled materials to produce packaging materials or using raw materials of biological origin to produce polymers?	moderate
Methods of communication with regard to changes in eating habits	How can we align the nutritional and hygiene habits of the population more closely with government recommendations?	moderate
Methods for checking the effectiveness of prevention measures	How relevant are food-related risks in the different population groups and how can these risks be reduced?	moderate
Authenticity and food fraud	<p>What tools should be developed to verify origin and to detect fraudulent food products?</p> <p>How can these methods be developed as rapid tests suitable for use in the field?</p>	moderate

3.3 Early detection and prevention of animal diseases and zoonoses



Herd health care is the cornerstone of animal health. The principle of **herd health management** should be developed accordingly. To this end, research is required to ensure effective stakeholder involvement, improve biosecurity, reduce antibiotic use, develop vaccination strategies, extend diagnostic tools, utilise existing databases and improve data quality.

Another key element is **surveillance**. Surveillance methods should be refined and tailored to the dynamic environment and to ever-changing environmental conditions. This requires targeted research into monitoring and surveillance systems, notably where gaps exist in disease surveillance, early detection, assessment of new dangers and risks, and the monitoring of antibiotic resistance and antibiotic use.

In international comparisons, Switzerland has an excellent status with regard to state control of animal diseases. To maintain and enhance that status, it needs to conduct accompanying research into the fundamentals of animal diseases and zoonoses. This application-oriented research should facilitate and/or optimise the eradication and **control** of animal diseases and zoonoses (i.e. research should focus on strategy development, disease diagnosis and evaluation of control measures).

Animal husbandry systems, forms of production (e.g. pig producer groups, calf fattening) and animal transport should be assessed with regard to food safety risks on the one hand and effective prevention of infectious diseases and antibiotic resistance on the other. Basic principles for innovative systems should be explored.

Research is also needed in order to refine methods and build and use databases in the **One Health** context. This is important for the detection, prevention, surveillance and control of pathogens and diseases that are relevant to animals, humans, food and the environment.

Effective implementation of research results, early detection, surveillance and control programmes, as well as sustainable, targeted strengthening of disease awareness among animal owners and veterinarians, demands a target group-specific analysis of **communication** informed by social science. Communication concepts should be developed on this basis.

3.3.1 Priority topics for animal health and StAR 2021–2024

Knowledge gaps	Research questions arising from these gaps	Priority
Social science aspects of antibiotic use, prevention, economic considerations for prevention, risk factors for antibiotic use	<p>Which socio-economic aspects influence antibiotic use and prevention?</p> <p>What influences the actions of animal keepers and veterinarians (pets and farm animals) in antibiotic use and prevention?</p> <p>What are the risk factors for antibiotic use?</p>	high

Knowledge gaps	Research questions arising from these gaps	Priority
Conflicts of interest animal welfare / animal health / public health / environment (different official objectives)	<p>How can conflicts of interest in the field of animal welfare / animal health / public health / environment be identified, recorded and analysed?</p> <p>What are promising approaches for dealing with conflicts of interest? Example of conflicts of interest: outdoor keeping of animals – animal health, antibiotic reduction / use of complementary medicine / deterioration in animal welfare</p>	high
Data from the Internet, such as keywords used for searching, as alternative data sources for early detection, e.g.: early detection of emerging diseases	<p>What options arise by using data from the Internet (event-based surveillance) for the monitoring and early detection of emerging diseases in pet animal health?</p> <p>What are the challenges?</p>	high
Potential for using metagenomics and whole genome sequencing in the diagnosis of animal diseases, zoonoses and food-borne diseases	<p>What is the potential and what are the challenges of using metagenomics in the diagnosis of animal diseases, zoonoses and food-borne diseases? Challenges include the robustness of methods and data sharing.</p>	high
<p>New therapies, e.g. phages, benefits in therapy / prophylaxis</p> <p>Using findings from microbiome research for animal health</p>	<p>What are the benefits of novel therapies, in particular phages but also immunity enhancement, and what is the significance of microbiome findings for prevention and therapy in a One Health context?</p>	high
Artificial intelligence, machine learning: using them for customised reporting	<p>What are the benefits of machine learning and artificial intelligence for extracting information from large databases and for generating customised reporting? What are the challenges?</p>	high
Coordinating research in wildlife with animal health issues	<p>How can research in wildlife be coordinated with research questions from animal health?</p>	high
Options for effective information transfer and guidelines for animal keepers and consumers	<p>What are the options for effective information transfer to animal keepers and veterinarians in the context of antibiotic use?</p> <p>How can guidelines be communicated so as to ensure a high degree of implementation?</p>	moderate
Vulnerability to disease outbreaks in animal production systems	<p>How vulnerable are our animal production systems? What are the animal health risks of AFP (collaborative pig production)?</p> <p>How severe are the risks and what options are there for reducing risks, e.g. in the case of African Swine fever (ASF) and porcine reproductive and respiratory syndrome (PRRS)?</p>	moderate

Knowledge gaps	Research questions arising from these gaps	Priority
How/where can smart farming support health surveillance?	What options do data collected on-farm in a smart farming context offer for surveillance and early detection in animal health?	moderate
Supply of veterinary medicinal products to Switzerland	Analysis of the Swiss supply situation regarding veterinary medicinal products: reasons for bottlenecks, impact, possible solutions	moderate
Disposal of milk containing antibiotics, new approaches	Analysis of the situation in Switzerland: respective percentages of disposal routes, effects, international comparison, prioritisation, possible solutions	moderate
Why is Switzerland a leader in intramammary antibiotic use?	Why is Switzerland a leader in intramammary antibiotic use? What are the reasons for this situation? What are the possible solutions for improvement?	moderate

3.4 Animal welfare



For animal welfare, it is vital that animals' needs are researched and that those who keep and handle animals, as well as the wider population, know and understand these needs. Research characterised by both high scientific quality and high relevance to specific animal welfare problems has the greatest potential to effect sustainable improvements in animal welfare, and is therefore given priority. The formulation of annual research priorities is additionally supported by the Animal Welfare Strategy for 2017 and beyond.

3.4.1 Priority topics for animal welfare 2021–2024

Knowledge gaps	Priority
Developing new methods and improving established methods for recording animal welfare	high
Optimising methods for anaesthesia and the killing of animals	high
Assessing the housing conditions of livestock, domestic animals and wild animals, especially in the light of technical innovations in animal husbandry and societal changes. At the interface with animal health, this includes assessing new types of housing aimed at the effective prevention of (infectious) diseases	high
Impact of new uses, forms of production and technologies on animal welfare (e.g. aquaculture, sports, therapy animals)	high
Welfare-related aspects in the breeding of animals	high
Implementation of 3R requirements in animal experiments	high
Evaluating the impact of existing and future animal welfare regulations on animal welfare	high

Knowledge gaps	Priority
Importance of rearing for later well-being of animals	high
Importance of good management for well-being	high
Identifying the behavioural needs where there are (economic) win-win situations for farmer and animal, and where there are none: determining the leverage effect of measures	high
Management / digitisation/automation / well-being / importance for the animal and importance for the animal-human relationship	high
Studies on societal developments in the context of human-animal interaction	moderate
New methodological approaches to reinforce the practical implementation of research project findings	moderate

3.5 Species conservation



As part of its enforcement activities under [CITES](#), the FSVO aims to support research projects contributing to the sustainable use of natural resources in countries of origin. In particular, it will support projects on the sustainable use of snake species for the production of leather, the use of orchid species in the cosmetics industry, the biological baseline survey for a newt species much in demand for terraria, and the identification of rosewood species from Madagascar.

3.5.1 Priority topics for species conservation 2021–2024

The FSVO will continue to provide financial support for projects concerning trade in wild animals and plants involving Switzerland and the sustainability of such trade.

3.6 Inter-division and inter-office priority research topics

Research topics concerning several divisions or offices were developed by a participatory process. Topic groups I, II and III were discussed between representatives of the various divisions of the FSVO, FOPH, FOAG and FOEN. Some topics in the divisional priorities were also discussed from a slightly different, more division-specific perspective.

Topic group I: Social science aspects of food systems

Knowledge gaps	Research topics	Concerns (lead agency underlined)
Options for effective information transfer and guidelines for consumers	<p>What are currently the main observable triggers that induce a change of behaviour in the population (mainly in terms of diet)?</p> <p>How can the nutritional and hygiene habits of the population be aligned more closely with government recommendations?</p> <p>Are there gaps and inadequacies in terms of market supply which would allow consumer behaviour to be aligned with recommendations?</p>	<u>FSVO-Food and Nutrition</u> , FOEN

Knowledge gaps	Research topics	Concerns (lead agency underlined)
Options for effective information transfer and guidelines for animal keepers	<p>What are the options for effective information transfer to animal keepers and veterinarians in the context of antibiotic use and in other problem areas?</p> <p>How can instructions be communicated so as to ensure a high degree of implementation?</p>	<u>FSVO-Animal Health</u> , FSVO-Animal Welfare, FOAG
Socio-economic aspects of antibiotic use, considerations for prevention, risk factors concerning antibiotic use	<p>Which socio-economic aspects influence antibiotic use and prevention?</p> <p>What influences the actions of animal keepers and veterinarians (pets and farm animals) in antibiotic use and prevention?</p> <p>What are the risk factors for antibiotic use (and also for no antibiotic use)?</p>	<u>FSVO- Animal Health</u> , FSVO-Animal Welfare, FOAG
Conflicts of interest animal welfare / animal health / public health / environment (different official objectives), e.g. outdoor animal keeping – animal health, antibiotic reduction / use of complementary medicine / deterioration in animal welfare	<p>How can conflicts of interest in the field of animal welfare / animal health / public health / environment be identified, recorded and analysed?</p> <p>What are promising approaches for dealing with conflicts of interest?</p>	<u>FSVO- animal health</u> , FSVO-Animal Welfare, FOEN, FOAG
For which behavioural needs are there (economic) win-win situations for farmer, animal and environment; where are there none?	How can the leverage effect of measures be determined?	FSVO- Animal Welfare, <u>FSVO-Animal Health</u> , FOEN
Assessing the housing conditions of livestock, domestic animals and wild animals, especially in the light of technical innovations in animal husbandry and societal changes	Which husbandry systems are aimed at effective prevention of (infectious) diseases (interface with animal health) and reduce the impact on the environment, e.g. CO ₂ emissions, landscape, water protection?	<u>FSVO- Animal Welfare</u> , FSVO-Animal Health, FOAG, FOEN
New uses, forms of production and technologies (e.g. aquaculture, sports, therapy animals)	What are the effects of these new uses, production methods and technologies on animal welfare and animal health?	<u>FSVO- Animal Welfare</u> , FSVO-Animal Health
Insects as feed and the consequences for food	Could the use of insects as food or feed be harmful to health and/or transmit diseases, under what conditions?	<u>FOAG</u> , FSVO-Risk Assessment

Topic group II: Health and welfare of humans and animals, One Health

Knowledge gaps	Research topics	Concerns (lead agency underlined)
<p>Use of findings from phage, immunity and microbiome research to develop and establish novel technologies and methods for improving animal health in a One Health context</p>	<p>New research findings can be used to develop novel prevention and therapy methods: examples are the use of phages, immunity enhancement in young animals, and findings concerning the microbiome of plants, which controls their immune defences. It is not known which novel treatment approaches are currently available and what their potential is for use in veterinary medicine (in prevention and therapy). The benefits of novel therapies should be explored. To what extent can findings concerning the microbiome of plants be transposed to animals?</p>	<p><u>FSVO- Animal Health</u>, FOPH, FSVO-Food and Nutrition, FOAG</p>
<p>Flow of veterinary medicinal products: specific features of Switzerland's supply of veterinary medicinal products and disposal of antibiotic-containing milk from treated cows</p>	<p>To safeguard Switzerland's supply of veterinary medicinal products, research will analyse the current supply situation, supply routes and economic dependencies in the supply chain, and investigate reasons for increasing bottlenecks and for possible effects with relevance for animal welfare. Possible solutions and predictions regarding the security of supply will be presented on the basis of a roadmap.</p> <p>Analysis of the current situation regarding the disposal of antibiotic-containing milk from treated cows, taking into account the disposal routes, the effects on animal health, food safety and the environment, and international comparisons.</p> <p>Producing a practical disposal concept based on scientific recommendations and taking account of innovative new solutions.</p>	<p><u>FSVO- Animal Health</u>, FSVO-Animal Welfare, FOAG, FOEN</p>
<p>Developing new methods and improving established methods for recording animal welfare</p>	<p>In addition to development, we should also promote enforcement and implementation on as many farms as possible by exploring options for increased, nationwide use of the methods.</p>	<p><u>FSVO- Animal Welfare</u>, FSVO-Animal Health, FOAG</p>
<p>Digitisation, automation and use of artificial intelligence in the management of animal populations</p>	<p>Digitisation and automation are increasingly being used to manage animal populations and ensure animal welfare. The resulting data pose great challenges in terms of evaluation, both at individual farm level and across multiple farms. Machine learning and artificial intelligence can be used to extract information from large databases and to generate customised reporting. Evaluation focuses on the</p>	<p>FSVO- Animal Welfare, <u>FSVO-Animal Health</u>, FOAG</p>

Knowledge gaps	Research topics	Concerns (lead agency underlined)
	importance of digitisation for the animal and for the animal-human relationship. Further benefits can be generated in specific disease surveillance, in monitoring of animal health and welfare in general, and by generating performance and management parameters at farm or population level.	
Animal welfare aspects in animal rearing	In assessing the animal-friendliness of housing facilities and husbandry systems, the two centres of Tänikon and Zollikofen have repeatedly found that rearing conditions are crucial. Examples are raised perches for broilers and parent birds (ambulation), or inadequate stall or cubicle dimensions for cows due to breeding for large animals to optimise milk yield.	<u>FSVO- Animal Welfare</u> , FSVO-Animal Health, FOAG
Importance of farm animal rearing for later well-being	This topic is relevant for all species. Examples are the importance of rearing conditions for later tail biting in fattening pigs, or the optimising of husbandry conditions in pullet rearing with a view to the later use of resources in aviary systems.	<u>FSVO- Animal Welfare</u> , FSVO-Animal Health, FOAG

Topic group III: Methods for risk assessment and risk management

Knowledge gaps	Research topics	Concerns (lead agency underlined)
Analysis of design, dose-response relationship and statistical evaluation of animal studies, as well as the evaluation of -omics data	How can the influence of study design on the outcome of the study be better understood and considered? To what extent can certain toxicology studies be conducted without animals?	<u>FSVO- Risk Assessment</u> , FSVO-Animal Welfare
Use of whole genome sequencing and metagenomics in the diagnosis of animal diseases, zoonoses and food-borne diseases	Analysis and management of data generated by whole genome sequencing. What is the potential and what are the challenges of metagenomics in the diagnosis of animal diseases, zoonoses and food-borne diseases? How robust are these methods? How can data sharing be optimised?	FSVO- Risk Assessment, <u>FSVO-Animal Health</u> , FSVO-Food and Nutrition

Knowledge gaps	Research topics	Concerns (lead agency underlined)
Methods for early detection by using information from the Internet and data from new communication technologies	<p>How can data from social media be used for the early detection of food-borne diseases?</p> <p>What options arise by using data from the Internet (event-based surveillance) for the monitoring and early detection of emerging diseases in animal health and public health?</p> <p>What are the challenges?</p>	<p><u>FSVO- Risk Assessment</u>, <u>FSVO- Animal Health</u></p> <p>FSVO-Food and Nutrition</p>
Methods for checking the effectiveness of prevention measures	How can the effectiveness of prevention measures be assessed?	<p><u>FSVO-Food and Nutrition</u></p> <p>FSVO-Risk Assessment</p> <p>FSVO- Animal Health</p> <p>FSVO- Animal Welfare</p>

3.7 Other interdepartmental research topics

The Research and Innovation Promotion Act (RIPA) stipulates that the multi-annual programmes (research concepts) must be drawn up on an interdepartmental basis.

In 2017, within the coordination committee for government research, a working group of representatives from ARE, FOAG, FOEN, FOPH, FSO, FSVO, SERI and SFOE was set up to identify common “interdepartmental research topics” with a view to drawing up the research concepts and the ERI message. Following a plausibility test to identify joint research topics based on the federal government’s “Sustainable Development Strategy”, a survey of all federal agencies represented in the Committee was carried out from November 2017 to January 2018. Based on that strategy’s nine fields of action, seventeen federal agencies produced a list of around 240 topics with the potential to lead to joint research projects.

The working group condensed the proposed topics into thematic areas and assigned them to five levels of action of key importance for human beings (nutrition, housing, leisure, work, safety). At a July 2018 workshop attended by twenty-one participating federal agencies (ARE, ARMASUISSE, FEDRO, FOCP, FOEN, FOPH, OFCOM, FOSPO, FOT, FOCA, SFOE, FSO, FCh, FSVO, FOAG, FSO, FOH, FDFA/SDC, MeteoSwiss, SERI, SECO), the research topics were worked out in more detail and the parties’ interest or willingness to develop them further was clarified. This process identified five central research topics that are of great interest to the Federal Administration and where there is a need for government research: (1) Sustainable Behaviour, (2) Sharing Society, (3) Data Security, (4) Smart Regions and (5) Health and Environment (Annex A6).

The preferred topics in the five proposed interdepartmental research themes were clarified by surveying the participating federal agencies. “Sharing Society” was selected as a suitable research topic for a pilot project of interdepartmental research cooperation. Based on the lessons learned in the pilot project, the other four interdepartmental research topics will be addressed in phases over the 2021–2024

ERI period by the federal agencies that have identified an explicit need for research in order to fulfil their tasks.

The various options for funding these interdepartmental research topics include funding through the agency budget, a Federal Council proposal, or the launch of a national research programme. The type of funding will be determined by the programme and subject experts, depending on the research questions identified.

4 Funding for 2021–2024

In its budget planning for 2021–2024, the FSVO assumes that expenditure on research will remain constant compared with the previous research period. Table shows the intended budgets for FSVO research projects in 2021–2024.

Table 3: Budgeting 2021–2024

Year	A200.0001 fw Contract research (in CHF 1'000)	A231.0252 Research contributions (in CHF 1'000)
2021	3,000	647
2022	3,000	653
2023	3,000	660
2024	3,000	660

The figures are assumptions rather than adjusted funds. The budgets for each year must be approved by the Federal Assembly.

5 Stakeholders and interfaces

The FSVO has its own research infrastructure (see Section 5.1) and collaborates with many stakeholders and organisations at both national and international level. A list of the main research partners is given below (see Section 5.2).

5.1 The FSVO's internal research facilities

Some activities of the FSVO laboratories and the Centre for Proper Housing of Ruminants and Pigs in the Tänikon unit fall within the definition of government research (*Ressortforschung*) found in the Frascati Manual⁴. However, monitoring activities and scientific services that are not classed as research, such as evaluations and expert reports, are not presented in this research concept.

5.1.1 Liebefeld site

At the Liebefeld campus, the Laboratories division has efficient modern facilities for molecular biology, microbiology and chemical trace analysis. The laboratories test for substances and elements (whether contaminants, ingredients or micronutrients) and for harmful organisms and viruses in food and consumer goods. They investigate the health status of the population with regard to nutritionally relevant parameters and exposure to undesirable substances ("biomonitoring"). By means of these activities, the laboratories create a scientific basis for risk assessment and for the FSVO's evidence-based risk management measures. They also support the implementation, impact monitoring and further development of the Swiss nutrition strategy through monitoring and research. The Laboratories division is also the Swiss national reference laboratory for food-borne viruses and for genetically modified organisms (GMOs) in food.

⁴ https://aramisnet.kaformatik.ch/Wiki/bv3/f.php?f=r/frascati/frascati_en.pdf?t=1479475292

5.1.2 Tänikon site

The Centre for Proper Housing of Ruminants and Pigs (ZTHT) is a division of the FSVO's Animal Welfare department and is a research group based at Agroscope's Tänikon site. The ZTHT develops scientific principles for the proper housing of cattle, pigs, sheep and goats. The FSVO uses its research findings to develop animal welfare legislation and to support cantonal enforcement in the field of animal welfare. The ZTHT also carries out projects for the testing and approval of mass-produced housing systems and facilities for ruminants and pigs (Art. 7 para. 2 AniPA). The ZTHT is embedded within Agroscope as a research group in the research area "Animal Production Systems and Animal Health". In interaction with other Agroscope research groups, the ZTHT guides the development of livestock farming with a special emphasis on animal welfare aspects.

5.1.3 The Institute of Virology and Immunology (IVI)

The Institute of Virology and Immunology (IVI), with sites in Mithelhäusern and Bern, is a research institute affiliated to the FSVO. It is the only high-security laboratory in Switzerland with the capacity to diagnose and research highly contagious animal diseases (such as foot-and-mouth disease or swine fever). The Swiss Rabies Centre in Bern is affiliated to the IVI.

5.2 Main partners in the research field

The main partners in the research field from the latest research period are listed in Table . Project numbers refer to projects that are either in progress or have been accepted and are in preparation as at March 2020. All bodies cited have collaborated on at least at one FSVO research project. The FSVO expects to continue to collaborate with these institutions in the future.

Table 4: Overview of research partners

Research institutions	Number of projects per research area			
	Animal health and zoonoses	Animal welfare	Food safety	Nutrition
Agroscope	2	7	1	1
Spiez Laboratory			2	
Institute of Virology and Immunology (IVI)	5			
EAWAG (especially the centre for applied ecotoxicology)			2	
EMPA			1	
ETHZ			2	
Cantonal laboratories			2	
Swiss TPH	1		2	
University of Zurich, faculties other than Vetsuisse UZH	2	1	3	3
Vetsuisse Faculty Bern	8	9		
Vetsuisse Faculty Zurich	6	3	2	
Bern University of Applied Sciences, incl. HAFL	2			1
Veterinary Public Health Institute (VPHI)	5	3		
Zurich University of Applied Sciences (ZHAW)		1	2	2
Other research institutions from Switzerland	2		1	2
Foreign universities and research institutions	3	2	2	
SAFOSO AG	1	1		
Identitas AG	1	1		
Advisory and Health Service for Small Ruminants, Sheep Section	1			
Breeding associations		2		
Research Institute of Organic Agriculture (FiBL)	1	1		
Centre for Fish and Wildlife Health (FIWI)		2		

5.3 Relevant committees, monitoring groups, working groups at national level

Here is a selection of the most important commissions and working groups for FSVO research:

- Working group of the coordination committee for government research SERI
- Federal Commission for Nutrition (FCN)
- Standing committees of the Swiss Veterinary Service
- One Health subsidiary body of the Coordinating Body Confederation–Cantons under the Epidemics Act
- Ad-hoc Group on Sustainability Research (SCNAT)

5.4 Interfaces with the Swiss National Science Foundation (SNSF)

Collaboration between the FSVO and the Swiss National Science Foundation relates mainly to the National Research Programmes (NRPs). The NRPs aim to provide solution-focused contributions to socially relevant topics at the interface between science and politics. The NRPs are commissioned by the Federal Council.

The FSVO is able to influence the national programmes at different stages:

1. by proposing a theme for a future NRP to the SEFRI, either alone or in collaboration with other offices;
2. by taking a position on programme proposals, in accordance with Art. 4 O-LERI-DEFR⁵;
3. by delegating an FSVO representative. The representative(s) of federal office(s) relevant to the programme support the steering committee and keep the federal government informed of the programme's progress. The FSVO currently has one representative in NRP 69 and one representative in NRP 72.

NRP 69: Healthy diet and sustainable food production

The National Research Programme “Healthy diet and sustainable food production” (NRP 69) develops practice-oriented scientific bases (strategies, tools, methods, processes, products) to support the development of sustainable dietary behaviour and food systems in Switzerland. NRP 69 has a financial framework of CHF 13 million for two research phases with a total duration of five years. The first call for proposals was launched in 2012 and research work began in autumn 2013. The results will be implemented from 2020.

NRP 72: “Antimicrobial resistance”

The programme was launched in 2015 and has a financial framework of CHF 20 million. The research projects will be completed by 2021. This NRP aims to improve our understanding of the possible origins of resistance genes and their transmission mechanisms, to develop new rapid diagnostic techniques, to identify novel antimicrobial molecules and to propose intervention measures. To these ends, the NRP pursues an integrated, interdisciplinary One Health approach. The National Strategy on Antimicrobial Resistance (StAR), developed by FOPH, FSVO and FOAG in cooperation with FOEN and the cantons, is a key element of NRP 72.

5.5 Interfaces with federal offices and other national institutions

5.5.1 Federal Office of Public Health (FOPH)

The FSVO and FOPH cooperate closely on several important research questions. For example, the FOPH coordinates the Swiss antibiotics strategy (StAR), in which the FSVO is responsible for the use of antibiotic veterinary medicinal products. Furthermore, the two Offices coordinate and cooperate closely on strategies and programmes in the areas of non-transmissible diseases, nutrition and exercise. A specific example of this is the FSVO, FOPH and SFOE project “Legionella control in buildings⁶”.

5.5.2 Federal Office for Agriculture (FOAG)

The FSVO and FOAG cooperate in joint strategies (food chain strategy) and also on selected individual research projects incorporating aspects of both agricultural and veterinary practice. A good example is project 1.18.14TG “Smart Animal Health, health indicators for farm animals⁷”.

5.5.3 Agroscope

The research areas covered by Agroscope extend along the whole length of the value chain in the agricultural and food sector. For this reason, Agroscope's fields of activity have interfaces and synergies with FSVO research priorities. As a result of this orientation, Agroscope is also a stakeholder in research and an intermediary for the dissemination and implementation of research findings. In the previous research period (2017–2020), Agroscope carried out three projects for the FSVO (Aramis 1.18.09, 2.19.01 and 4.17.03).

⁵ <https://www.admin.ch/opc/fr/classified-compilation/20131577/index.html>

⁶ <https://www.blv.admin.ch/blv/en/home/gebrauchsgegenstaende/forschungsprojekte-gebrauchsgegenstaende/forschungsprojekt-legionellen-gebaeuden.html>

⁷ <https://www.blv.admin.ch/blv/en/home/tiere/forschungsprojekte-tiere/forschungsprojekt-smart-animal-health.html>

5.5.4 Swiss Centre for Applied Human Toxicology (SCAHT)

The Swiss Centre for Applied Human Toxicology (SCAHT) is a network of research groups at Swiss universities and research institutes. SCAHT conducts research and development projects in sub-areas of human toxicology, with a focus on toxicological issues relevant to health protection. For the BLV, SCAHT is an important contact for experimental research and regulatory advice at the interface between food and chemical safety. Together with the FOPH, FOAG, FOAGW, Seco, FOEN and Swiss-med, the FOAG is represented in the strategic support group of the Swiss Confederation, in which, among other things, SCAHT's research strategy is discussed and SCAHT's projects for the federal authorities are coordinated.

5.5.5 Zollikofen Centre for Proper Housing of Poultry and Rabbits (ZTHZ)

The Zollikofen Centre for Proper Housing of Poultry and Rabbits (ZTHZ) is run jointly by the FSVO and the Veterinary Public Health Institute (VPHI) at the Aviforum site. At the ZTHZ, the VPHI develops scientific principles for the animal-friendly housing of poultry and rabbits. The knowledge gained in the research projects is used by the FSVO to develop animal welfare legislation and to support cantonal enforcement in the field of animal welfare. The ZTHZ also carries out projects for the approval of mass-produced housing facilities and husbandry systems for poultry and rabbits (Art. 7 para. 2 AniPA). The FSVO has several service contracts with Aviforum to ensure that the necessary conditions for ZTHZ projects are met in terms of infrastructure and animal care. In the previous research period (2017–2020), the ZTHZ carried out four projects for the FSVO (Aramis 2.17.05, 1.18.14 TG, 2.18.04 and 2.19.02). The FSVO also supports other externally funded projects (e.g. Marie Curie Innovative Training Network).

5.5.6 National Centre for Climate Services

The FSVO is a member of the National Centre for Climate Services (NCCS), whose aim is to ensure cooperation and coordination in the provision of the knowledge base for adaptation to climate change (BR Resolution 09.04.2014, www.nccs.admin.ch). There is a close link to the Action Plan for Adaptation to Climate Change, which the Federal Council adopted on 19 August 2020 for the years 2022-2025.

The NCCS is managed by the directors of the participating federal offices and institutions, the Executive Committee and a secretariat. The office is located at MeteoSwiss. The FSVO contributes to the financing of the secretariat.

The NCCS has developed a comprehensive programme to fill knowledge gaps regarding the effects of climate change on all aspects of life in Switzerland. The programme comprises six projects and will be implemented 2021-2025.

The project "Health and Climate Change" will focus on the impact of climate change on the health and welfare of farm animals and on food safety. There is a close link with the FOPH's health strategy and the FSVO's animal health strategy.

5.6 Interfaces with international research

International cooperation is essential in research into human and animal health. The increasingly international nature of animal and food transportation and financial pressures in livestock farming and food production have resulted in a virtual dismantling of borders for animal diseases, food contamination and other vector-borne health hazards.

Switzerland therefore values close cooperation, especially with European partners. This takes place on the basis of research programmes and research networks, or via the appointment of Swiss experts to European research bodies.

A specific example of this activity is FSVO participation in the SCAR Collaborative Working Group (CWG) on Animal Health & Welfare Research. This group aims *'to provide a forum leading to improved collaboration on research prioritisation and procurement, creating the necessary critical mass and focus to deliver the animal health and welfare research needs of our policy makers and the European livestock industry'*. The group, which meets twice a year, initiated the ERA-NET Co-Fund project

“ICRAD, International Coordination of Research on Infectious Animal Diseases”⁸ with a budget of EUR 27 million. The FSVO is a full member of this project and participated at each stage, including the drafting of call documents. Of the sixty-nine projects proposed, four were submitted by consortia that included Swiss researchers. All proposals were evaluated by an international committee of experts. The FSVO contributes only to the funding of Swiss partners, and only if they meet its eligibility criteria.

6 Organisation, communication and quality assurance

6.1 Internal organisation

Research management within the FSVO is the responsibility of the FSVO Research Commission (for its composition, see Annex A1). Consisting of representatives of the FSVO’s specialised divisions, the Commission is led by the head of research (0.9 FTE) and has its own secretariat (0.6 FTE).

6.2 The research process

The research process includes the identifying of research gaps and the procurement of scientific project but also encompasses project monitoring and verification of the delivery of results and their implementation.

Identification of research gaps

At the end of the calendar year, the divisions are asked about their needs for scientific projects. They base this on the priority topics of the present concept and on topics arising from current events. On this basis, a provisional program is compiled and submitted to the Executive Board (GL).

Procurement of the projects

Depending on the estimated costs of the projects, the appropriate procurement method is chosen (by direct contract, invitation or open procedure).

Researchers can also submit spontaneous project proposals. These projects will be subject to a two-stage competitive process. The projects will be selected by external experts according to scientific quality and internal experts according to implementation potential and cost-benefit ratio.

Handling of the projects

The new projects are initiated by the Head of Research Management in cooperation with the Research Secretariat and the responsible division (contract preparation, kick-off). The accompanying expert for the topic in question provides support at the technical level. The projects are accompanied on an administrative level by the secretariat. If necessary, the research officer will submit proposals for contract adjustments to the division concerned. If the budget is affected, the research commission will make the necessary decisions. In the event of difficulties, the Head of Research Management proposes solutions.

Implementation of the project results

At the end of the project, the accompanying expert discusses the planned implementation measures with the research commission. Changes and additional implementation measures can be decided at this time.

In all cases, the results are communicated internally at the FOAG and externally to all relevant stakeholders. In some cases, projects are accompanied by communication during their development (see communication concept, Section 6.5).

⁸ <https://www.icrad.eu/>

6.3 Quality assurance

The interdepartmental coordination committee for government research issues quality assurance guidelines for research conducted by the Federal Administration.⁹ These guidelines are addressed in particular to federal agency personnel directly involved in research required to fulfil the tasks of the Federal Administration. Federal agencies with research responsibilities are instructed to apply these guidelines when designing their own Office-specific quality assurance concepts and guidelines.

Revised in 2014, the quality assurance guidelines take into account the recommendations of the Swiss Science Council (SSC)¹⁰: in research management, special emphasis is placed on support to ensure the efficient, effective development and evaluation of research results. The use of research results is analysed and documented. To maintain and expand the competence of the federal agencies as clients and users of research results, cooperation takes place with the higher education sector.

Research management within the FSVO follows the above-mentioned guidelines of the interdepartmental coordination committee for government research.

The FSVO maintains a process-oriented and certified quality management system according to ISO 9001. All quality-relevant work processes are documented and are regularly checked by external bodies. Naturally, this also applies to the research process. In 2021 the FSVO intends to examine the introduction of an electronic research platform to make the process more efficient and to simplify controlling.

6.4 Implementation of research results

Research findings are usually implemented after completion of a project under the direction of the responsible department. In specific cases where there is a vital need for knowledge and action and the results of the research projects permit, reliable initial findings may be implemented (e.g. detection methods or recommendations for vaccination strategies) before a project is completed. A project is regarded as completed once the final report and data sheet for Aramis have been submitted and accepted by the supervising expert.

From 2020, instead of an annual implementation meeting, completed projects will be immediately reviewed for their implementation. For this purpose, the accompanying expert will be invited to a meeting of the Research Commission (FoKo) after project completion to discuss the implementation measures. Checks will be carried out regularly (about every six months) to establish whether the knowledge gained from the completed research projects has been used to implement the planned measures or whether follow-up work is necessary. The practical worth of this new procedure rather than an annual implementation meeting will be examined in the course of 2021 and the process adapted accordingly.

6.4.1 Implementation categories

To ensure that findings obtained in research projects are implemented appropriately, the FSVO sets specific implementation goals from the outset, i.e. when a research project is selected. These goals can be assigned to the following categories:

A Risk assessment

- A1 Assessment of processes or management systems along the food chain, e.g. more animal-friendly housing systems, new food production processes
- A2 Development and validation of analytical methods, e.g. for diagnostics or residue analysis
- A3 Monitoring; establishing the data base for the assessment of specific situations
- A4 Developing and updating the knowledge base for safety and risk assessment, analysis of the data base

⁹ [“Quality assurance in Federal government research”](#) (in German), guidelines of the interdepartmental coordination committee for government research, 26 March 2014.

¹⁰ Final report of the ERI Steering Committee [“Evaluation of the implementation of quality assurance guidelines and the use of research results in government research”](#) (in German), April 2010.

B Risk management

- B1 Support for enforcement bodies and establishments through directives, issuing of technical instructions, guidelines, leaflets, advice
- B2 New legislation, e.g. setting new maximum levels, adapting regulations, issuing directives, proposing legislative amendments
- B3 Early detection, monitoring and control of risks (such as animal diseases, poor nutrition)

C Risk communication

- C1 Presenting results to specific target groups (consumers, producers, animal keepers)
- C2 Publication in the trade press
- C3 Communication of early detection results

D Further research

- D1 Results form the basis for follow-up projects

E Other implementation objectives

6.5 Communication concept for FSVO external knowledge transfer

6.5.1 Initial situation / mandate

The FSVO supports cantonal enforcement and fosters cooperation with both national and international stakeholders. Especially in research, it generates vast amounts of knowledge for a professional specialist audience and the general public.

Research carried out and commissioned by the FSVO (“government research”) must provide the administrative units with the scientific basis that will enable them to achieve their operational objectives. The Federal Administration also has a statutory mandate to inform the public appropriately about its research activities (both in-house and commissioned research projects) and to make research results publicly available. Communication about FSVO research should also demonstrate the FSVO’s core competences by ensuring that it is perceived as the specialist authority on animal welfare, animal health, food safety and nutrition.

The present communication concept for external knowledge transfer aims to support this mandate and to broaden knowledge of FSVO services, especially those related to research.

6.5.2 Objectives

The FSVO’s services and its research activities in particular should be accessible to **all interested parties** (professional specialist audience and general public).

All interested target groups (professional experts and general public) should be familiar with the FSVO’s services and its research activities in particular. They should understand the sense and purpose or necessity of FSVO government research and be aware of the (intended) implementation of the results of applied research.

FSVO research activities should be communicated promptly and attractively.

6.5.3 Target groups

All parties interested in FSVO topics: general public, media, donors, politicians, Swiss and foreign authorities, industry associations and specialists (e.g. nutritionists, veterinarians, animal keepers), researchers, other federal offices, FSVO.

6.5.4 Messages

General:

The FSVO makes decisions and formulates recommendations for optimising animal welfare, animal health, food safety and nutrition on a scientific basis. To this end, the FSVO initiates, supports and funds appropriate research projects.

Specific:

In the context of communication regarding individual research projects, messages regarding necessity, strategies and methods, implementation goals, successes, etc. are conveyed promptly and appropriately to recipients.

6.5.5 Strategy

The FSVO provides an overview of its services and especially its research activities, with links to further information on the FSVO website.

The information is prepared in multimedia format (e.g. content for media release, website and tweet) and is published cross-media (e.g. simultaneously via website, media release, newsletter and tweet) in order to reach the various target groups.

Aramis:

All research projects conducted, commissioned and supported by the FSVO are recorded and documented continuously in the Aramis database. The database is publicly accessible.

Continuous research reporting:

The target audience is provided with detailed, attractive information about ongoing research projects (see *Resources and Measures*). This helps the general public to understand the importance of research projects in achieving the FSVO's mandate.

Four-yearly research reporting:

A research report for the SERI, media, general public, donors (politicians, authorities [Swiss and foreign], trade associations and specialists [e.g. nutritionists and animal keepers] and other federal offices) is published at blv.admin.ch every four years. This gives an overview of FSVO research activities in the four-year period concerned. Reporting on the relevant project clusters is based on multimedia communication measures (infographics, video clips, etc.).

6.5.6 Resources and measures

Ongoing research reporting:

FSVO research activities will be given more presence at blv.admin.ch: the start page, above the category "(Other) Publications", will include a new section headed "FSVO research". This leads to the [general research page](#), which will be presented more attractively.

A research section will be added to each topic page. This leads to the corresponding thematic page "Research projects" (e.g. [Research projects in the veterinary field](#)). The individual thematic research projects will be listed in the left-hand column, with links to the relevant sub-pages. Selected research projects (especially projects with inter- and transdisciplinary research approaches making an important contribution to one of the FSVO's main topics) will be described there in multimedia form (text, image, sound). The individual research projects will be linked to the [general research page](#).

Wherever possible, story-telling will be used: stakeholders affected by the original issue and using the research results to improve a situation (e.g. sheep farmers and foot rot – success stories!) will give their accounts. Initial situations, processes and results will be presented by means of generally understandable, attractively designed infographics, etc. Results/milestones/experiences will be communicated promptly in consultation with the researchers.



Annexes

A1. Members of the Research Commission

Gérard Gremaud	Head of Research Commission
Michelle Vock	Research Secretariat
Claudio Zweifel	Research Officer, Department of Food and Nutrition
Martin Schrott	Research Officer, Department of Risk Assessment
Nadine Metzger Vogt	Research Officer, Department of Animal Health
Liv Sigg	Research Officer, Department of Animal Welfare
Lisa Bradbury	Research Officer, Department of Species Conservation

A2. Federal government research

Research that is initiated or supported by the Swiss Federal Administration is described as “government research”. Its results are required by federal government to fulfil its mandate or are in the public interest in the context of administrative action, such as the provision of scientific principles for policy development and design in the various policy areas (Section A3). Government research therefore lies at the interface between scientific research and policy or practice. It brings a scientific and technical dimension into the political debate and provides a basis for formulating policy objectives. It is legitimised by the Research and Innovation Promotion Act (RIPA, [SR 420.1](#)), which serves as the statutory framework for government research,¹¹ and by special legislative provisions (see Section A2). It is consistent with the strategies of the federal agencies and may comprise the following measures:

- the awarding of *research contracts* (contract research);
- the operations of federal research institutes (*intramuros research*)¹²;
- the implementation of own research programmes, namely in cooperation with university research institutes, research funding institutions such as the Swiss National Science Foundation (SNSF), Innosuisse or other funding organisations;
- *contributions* to university research institutes to carry out research projects and programmes;
- *contributions* from federal agencies to international institutions and organisations for research projects or programmes.

Government research does not include state contributions to research bodies under RIPA Article 4, namely the research funding institutions (SNSF, academies), Innosuisse, the university research institutes (Swiss federal institutes of technology; universities and other higher education institutions; research infrastructures, research institutions, technology competence centres under RIPA Article 15), or contributions to international scientific institutions and structural funding organisations.

In practice, government research is based on the five main principles of legality, expediency, effectiveness, cost-effectiveness and compliance with scientific quality standards. The primary responsibility for government research lies with the individual federal authorities that carry out, commission or fund the research.

¹¹ Overhaul of the RIPA dated 14 December 2012.

¹² The FSVO Laboratories also conduct intra-muros research, but are not classed as a federal research institute. This research falls under Art. 16, point 2(c) RIPA “own research programmes”.

A3. Official mandate

Statutory framework

The Federal Government's commitment to research and research funding is legitimised by Article 64 of the Federal Constitution (SR 101), which provides that the state promotes scientific research and innovation, or may set up, take over or operate research facilities.

With the overhaul of RIPA on 14 December 2012, the Act became a statutory framework for government research: the Federal Administration is a research body insofar as it conducts government-funded research for the fulfilment of its remit, or carries out activities to promote research and innovation (Article 4, letter d). The government promotes research and innovation pursuant to RIPA and other specific legislation by conducting its own research, including setting up and operating federal research facilities (Article 7, para. 1, letter e). The purpose and measures of government research (see above) and guidelines on matters such as the acquisition of external funding or overhead contributions are set out in Article 16. The setting up of federal research institutes is regulated by Article 17. An important aspect of government research is its coordination. For this purpose, the Federal Council is to set up an interdepartmental coordination committee whose remit includes coordinating the development of the multi-year programme and issuing guidelines on quality assurance (Article 42). The multi-year programmes for government research are a coordination and planning instrument. They are presented in the form of cross-cutting research concepts that take account of existing research priorities of the higher education institutions, the SNSF's funding programmes under government mandate, and the activities of Innosuisse (Article 45).

Specific legislative bases

Besides being anchored in the RIPA, Federal Administration research is based on more than fifty-five [specific legislative provisions](#). These programmes set out direct evaluation, inquiry or review mandates that require the corresponding scientific studies. In addition, "may" provisions in special laws create the legal prerequisites for the government to support research in specific areas via contributions (subsidies). The special laws specify the funding principles in more detail according to the Subsidies Act (SubA). Moreover, even in the absence of an explicit research mandate laid down by law, the application and implementation of applicable law (e.g. the adoption of guidelines and ordinances) often requires expert knowledge, which should be up-to-date and therefore needs to be developed through research. This is why research commitments are often part of the service agreement under the New Management Model for the Federal Administration (NMM), or are laid down in departmental organisation ordinances for the different offices.

Commitments under international agreements and parliamentary mandates

Besides the specific legislative provisions, more than ninety international agreements, conventions or memberships contain or imply commitments in terms of research or national research efforts in the relevant fields. But even where there are no explicit research commitments arising from mandates, commissioned research is vital to some offices in order to maintain necessary international contacts. Research carried out by the Federal Administration therefore enables an exchange on the basis of specialist knowledge founded on its own current scientific findings.

Parliament itself, through parliamentary initiatives, motions, postulates, representations or requests, issues mandates for the preparation of draft decrees, test reports or information, and the processing of such mandates may entail activities in the area of Federal Administration research.

A4. Coordination of Federal Administration research

Classification of Federal Administration research into policy areas

In the interests of effective coordination and cooperation between federal agencies, Federal Administration research is divided according to policy areas. The policy areas requiring a strategic research plan (RIPA Article 45, para. 3) are defined by the Federal Council in the relevant communication on the promotion of education, research and innovation (ERI) (RIPA Article 46, para 1, letter d). To this

end, the federal agencies concerned, under the direction of a lead agency and with the specific involvement of external expertise (usually a scientific monitoring committee or group), draw up four-year research concepts. The research concepts are drafted according to the principles of the interdepartmental coordination committee for government research.¹³ The research concepts are concise, comprehensive strategy documents. They serve to inform interested and affected research stakeholders, both within and outside federal government, and the public authorities in general. They also support the coordination of research and are a tool for planning and legitimising the government's research activities. Since the 2004–2007 ERI period, research concepts have been developed for the following eleven policy areas: 1. Health (lead office FOPH), 2. Social security (FSIO), 3. Environment (FOEN), 4. Agriculture (FOAG), 5. Energy (SFOE), 6. Sustainable spatial development and mobility (ARE), 7. Development and cooperation (SDC), 8. Security and peace policy (W+T, FOCP, FDFA/PD), 9. Professional education (SERI), 10. Sport and exercise (FOSPO) and 11. Sustainable transport (FEDRO, FOT).

Interdepartmental coordination committee for government research

The Committee consists of members of the Directorates or Executive Boards of the Federal Offices with their own research and of the Federal Financial Administration, and representatives of the SNSF, Innosuisse and the Board of the Swiss Federal Institutes of Technology (ETH Board). The Committee is chaired by a member of the Executive Board of the State Secretariat for Education, Research and Innovation (SERI).

Based on RIPA, the Committee's remit includes coordinating the research concepts¹³ and drafting quality assurance guidelines.¹⁴ In addition, the Committee ensures the strategic coordination of government research, acts as an active platform for the exchange of good practice in quality assurance, and records research expenditure and budgetary frameworks of Federal Administration research activities for reporting associated with the annual information notice to the Federal Council (information notice). It also performs tasks associated with the selection of National Research Programmes (NRPs) and National Centres of Competence in Research (NCCRs), coordinates between government research and other tools of programme research, and may initiate evaluations on overarching topics in the area of government research.

However, the Committee's remit does *not* include cross-departmental management of the financial resources of Federal Administration research. In 2006, the Federal Council rejected a recommendation to that effect from the Control Committee of the National Council on the management of government research resources by the Federal Administration.¹⁵ This control must ultimately be exercised by Parliament, which approves the relevant credits granted to the Offices, and is effectively ensured by current Parliamentary procedure in the context of annual budgetary decisions.

Working group and secretariat of the Coordination Committee

The drafting of basic principles, guidelines and reports on government research as well as the preparation of meetings and decisions of the Coordination Committee are carried out in a working group composed of research directors from the federal Offices. The working group is headed by the Secretariat of the Coordination Committee, which is located at the SERI. The Secretariat in turn ensures the flow of information between the federal Offices represented on the Coordination Committee, and oversees the latter's operations. It is responsible for the website www.ressortforschung.admin.ch, which provides brief information on research priorities in the [policy areas](#), current research concepts, links to the research pages of the federal Offices and documentation on the [legal basis](#) for research. The sites also contain standardised [Fact Sheets](#), which are updated annually by the lead Offices in each policy area. These fact sheets inform the public about successful research activities ("success stories") and about financial resources.

¹³ "Principles for the development of concepts 2017–2020 concerning the research activities of the Federal Administration in the 11 policy areas", interdepartmental coordination committee for government research, October 2014.

¹⁴ "[Quality assurance in government research](#)" (in German), guidelines of the interdepartmental coordination committee for government research, 26 March 2014.

¹⁵ BBI 2007 847 (<http://www.admin.ch/ch/d/ff/2007/847.pdf>).

ARAMIS database

The ARAMIS information system (www.aramis.admin.ch) contains information on research projects and assessments conducted or funded by the Federal Government. The aims and tasks of the system are described in the ARAMIS Ordinance ([SR 420.171](#)): (1) creation of transparency regarding funding flows in research and innovation, (2) coordination of projects funded or conducted by the Federal Government, (3) data collection for Federal Statistical Office (FSO) statistics in the area of “research and development in the Federal Administration”, (4) planning and control in the area of research and innovation promotion, and (5) project management support.

The information system functions as a simple database application in which all research projects and impact studies or assessments conducted by the Federal Administration are listed as individual or cross-referenced projects. ARAMIS serves as a pillar of quality assurance in the area of federal government research and is anchored accordingly in the Coordination Committee’s quality assurance guidelines. To support research coordination and planning, and to ensure efficient use of resources, detailed information on types of research (intramuros, contract research and research contributions), contractors and Offices’ expenditures under the research concepts is compiled annually for the Federal Council and the Coordination Committee on the basis of ARAMIS. This keeps them informed about the development and use of funds in the individual offices with regard to financial planning.

A5. Coordination Committee objectives for 2021–2024

The Coordination Committee has the following primary objectives for 2021–2024:

(1) The research concepts for the eleven policy areas will be developed according to the Committee’s principles. They will be based on the requirements in RIPA (Section 3: Research and innovation policy planning) and in the quality assurance guidelines for government research. Where objectively possible or necessary, government research will be linked to general research and innovation promotion. The research topics addressed in the policy areas are often cross-cutting and involve the responsibility of different offices and departments. The Coordination Committee will therefore review the division of government research into eleven policy areas, with a view to making adjustments.

(2) With regard to drawing up *interdepartmental* research concepts for 2021–2024, various activities were carried out in 2017–2020 to identify interdepartmental research topics: federal agencies were asked about possible cross-policy research topics based on the nine fields of action of the federal “sustainable development” strategy for 2016–2019. This identified five central research topics that are of major interest to the federal agencies and where there is a need for research on the part of the Federal Government: (1) Sustainable Behaviour, (2) Sharing Society, (3) Data Security, (4) Smart Regions and (5) Health and Environment. A pilot project will be carried out to identify research questions of the interested federal agencies on the research topic “Sharing Society”, taking into account existing studies on this topic (especially in the areas of policy design, opportunities and risks, rebound effects, data handling, behavioural change, effects on resource consumption, sustainability, business models). The options for implementation, for example within the framework of a joint research programme of the federal agencies, will also be clarified. Based on the lessons learned in the pilot project, the other four interdepartmental research topics will be addressed in phases in the 2021–2024 ERI period by the federal agencies that have identified an explicit need for research in order to fulfil their tasks.

(3) With the redesign of RIPA in 2012 as a framework act for government research, it was expected that this framework would allow all current special laws for government research to be reviewed systematically or any newly planned special laws to be formulated with regard to provisions on research in accordance with the RIPA framework (simplification and improved coherence of legislation). The implementation of this requirement was examined under an expert mandate:¹⁶ in purely quantitative terms, no major adjustments were made to the special laws. The expert report describes the development of a common understanding in the Coordination Committee of Art. 16 et seq. RIPA and recommends the provision of guidelines for a review of the special legislation by the responsible departments. The Coordination Committee should therefore, on the one hand, reach a common understanding on the interpretation of the legal provisions in the RIPA and, on the other hand, offer support in

¹⁶ Expert opinion “*Die Anpassung der spezialgesetzlichen Grundlagen für die Ressortforschung des Bundes nach Ausgestaltung des FIG als Rahmengesetz für die Ressortforschung*”, Prof. F. Uhlmann, 4 December 2017.

adapting the special legislation in the case of upcoming legislative revisions with regard to articles concerning government research.

(4) To improve the representation of Federal Administration interests in NRPs and to enable the Federal Administration to make better use of them, the specifications have been adapted to reflect the tasks and functions of federal government representatives in the NRP Steering Committees. If necessary, several federal representatives from different federal agencies can sit on the Steering Committees. In preparing and implementing the NRPs, SERI and SNSF ensure balanced funding of applied and fundamental research on specific topics. The expertise provided by the federal agencies will be used systematically from the start of the NRPs.

A6. Interdepartmental research topics between federal agencies in the period 2021–2024

The Antibiotic Resistance Strategy (StAR), adopted by the Federal Council in 2015, can be cited as a model for the successful implementation of interdepartmental research through cooperation between multiple federal agencies. Human, animal and environmental health are closely linked and influence each other. The strategy is therefore based on the One Health approach, which involves all affected areas equally.

The five topics identified for interdepartmental research by federal agencies are presented below. The furthest advanced topic is Sharing Society, because it was selected as a pilot topic and has been in development since 2019.

Sharing Society

Resource sharing has potentially important and varied social, economic and environmental impacts. Sharing Society can lead to changes in social safeguards and competition and contribute to a more efficient use of natural resources. However, the creation of new consumption opportunities can also lead to significant rebound effects (the savings potential of efficiency gains is not or is only partially achieved) triggered by cheaper products and services. Sharing Society concepts also influence the use of space (e.g. changed mobility). The expansion of the Sharing Economy raises regulatory issues as well (see the Federal Council report “Framework conditions for the digital economy”, TA-Swiss study “Sharing Economy – sharing instead of owning”).

At a March 2019 workshop attended by Federal Administration experts, the following research questions were identified in the three clusters “Behaviour”, “Society” and “Framework Conditions”:

Cluster “Behaviour”

- Which incentives favour which sharing business models?
- Which incentives encourage people to use sharing offers, and are there any exclusion mechanisms?
- What are the drivers and impacts of rebound effects?
- What are the drivers for sustainable behaviour when dealing with sharing systems?
- The federal agencies interested in working on these topics are ARE, FEDRO, FOAG, FOCP, FOEN, FOH, FSO and SERI.

Cluster “Society”

- Where does the potential of sharing systems lie in terms of society and resource efficiency?
- How can (peripheral) spaces be made more attractive and multifunctional through sharing, and what are the effects on infrastructure?
- Are sharing systems fairer (winners/losers) than conventional systems?
- Who pays for infrastructure and external costs, and when does this need to be regulated?
- How can the sustainability of sharing systems be assessed (at regional / national / global level)?
- How do sharing networks influence awareness in handling resources, and how can this be measured?

- The federal agencies interested in working on these topics are ARE, FOAG, FOCP, FOEN, FOH, FSO and SFOE.

Cluster “Framework Conditions”

- How can the state create / enable experimental spaces in order to test sustainable solutions? How can it contribute to the scaling of promising niches?
- How can we ensure that digital data in connection with sharing offers is not misused despite open access?
- Which data especially merits protection and how will data sovereignty be regulated?
- What potential lies in linked databases for new sharing offers?
- Should and can data quality be secured as standard?
- What are the roles of state and private parties in the Sharing Society?
- Where are public-private partnerships useful and how can they be promoted to create sustainable business models and avoid conflicts of interest?
- Which framework conditions are necessary so as to respond quickly to new sharing models?
- How can liability issues be regulated?
- How can social responsibility be guaranteed?
- How can fair/equal competition take place between “official” and “private” providers, taking into account rules/authorisations?
- Which framework conditions are needed to ensure that sharing increases the welfare (in terms of sustainability) of the Swiss population?

The federal agencies interested in working on these topics are ARE, FEDRO, FOAG, FOCP, FOEN, FOH, FOT, FSO, FSVO, SERI and SFOE.

Sustainable behaviour

Socio-economic issues are central to the topic of “Sustainable Behaviour”. The topic also includes behavioural economics, behaviour-guiding information and communication, and Corporate Sustainable Responsibility. Regarding the achievement of the Sustainable Development Goals (SDGs), it was recognised that both individual and group behaviour and the steering or influencing of this behaviour are key elements for a societal transformation towards sustainable development. For example, sustainable behaviour plays an important role in levels of action such as housing, mobility and nutrition.

The central question is how to bring about desired sustainable changes in behaviour. Which measures are efficient? How can the different stakeholder groups be reached? Which cultural and linguistic forms and which channels should be chosen for communication? Which environmental factors are decisive (financial situation, educational level, language or cultural barriers)?

Data security

The topic of “data security” also includes data protection in general. This cross-sectional topic is gaining in importance with the application of information technologies. Particular attention should be paid to technology impact assessments. Questions concerning cybercrime, basic services and security of supply in dealing with infrastructure and mobility are highlighted. The issues of misuse of information, dealing with values, social equality of opportunity and aspects of health equity are also gaining in importance. In addition, questions relating to Open Science will be addressed: e.g. regulations in the field of research and ensuring free access to research results and databases.

Smart Regions

This topic comprises three sub-topics: i) Circular economy and bio-economy, ii) Urban-rural relationship in the digital age, iii) Sustainable residential development and iv) Sustainable mobility.

(i) Circular economy

Against a background of scarce resources and raw materials, the concept of circular economy is gaining in importance. By closing energy and material cycles (product longevity, maintenance, reparability,

recycling possibilities), the use of resources, waste, emissions and energy consumption should be reduced. The topic plays a role in all economic activities that make intensive use of resources and raw materials.

The following research questions are relevant to this topic:

How high is the ecological benefit of the circular economy and for which materials? Where does the ecological optimum of the circular economy lie, in view of the need to transport raw materials and the efficiency of recycling processes? Which industries and products are best suited to the circular economy, which are less so? How do the costs and benefits of the circular economy relate to a reduction in the use of materials or dematerialisation? What are the limits of the circular economy and what depot management (residues) is necessary within a circular economy framework? Which economic, political and technical measures promote the circular economy? Which laws and regulations obstruct the circular economy?

(ii) Urban-rural relationship in the digital age

Switzerland's spatial structures and the relationships between urban and rural and between different regions are in a state of constant flux and are influenced by digitisation. What expectations does each area have towards the others? What services do they offer? How and where will public services (basic services) be provided in the future, e.g. in healthcare? How will changing forms of work affect people's choices of where to live and work? What influence do changed mobility offers have on behaviour (especially leisure behaviour) and the environment? Does digitisation overall promote more careful use of land resources or, conversely, does it lead to greater fragmentation, e.g. in the form of increasing urban sprawl?

(iii) Sustainable residential development

How can more sustainable residential development be promoted at neighbourhood and community level, offering local services, work and recreational and leisure opportunities, reducing motorised mobility and its emissions and contributing to the social coexistence of different population groups (social justice, ageing)? How can synergies be achieved with ecological infrastructures, food supply (e.g. urban farming, urban forestry) and the above-mentioned circular economy? How can the goal of increasing density and the quality of nature and landscape in these urbanised areas be promoted at the same time?

(iv) Sustainable mobility

How can we achieve net zero emissions in the transport sector by 2050? Which clean propulsion energies make ecological sense? Studies to investigate the possibilities and consequences of decarbonisation (phasing out fossil fuels) of transport (including life cycle analyses, technological progress and consideration of all environmental impacts and possible trade-offs).

Health and environment

Health is influenced by the environment in myriad and complex ways. According to the World Health Organization (WHO), health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. An intact environment prevents diseases and promotes healthy development, but is also an important prerequisite for good quality of life.

By far the greatest environmental problem in terms of negative health impacts, both globally and in Switzerland, remains air pollution due to pollutants, primarily from traffic, but also from industry, heating, agriculture and the indoor evaporation of chemicals. For several other environmental problems, we still have gaps in our knowledge concerning possible effects on human health: possible risks due to multiple residues of plant protection products in food and water, endocrine disrupters in water, non-ionising radiation and noise pollution, use of organisms, natural hazards and incidents, and the consequences of climate change on human and animal health.

In addition, there are cross-thematic research questions regarding population exposure due to the possible additive or synergistic effect of multiple concomitant environmental stressors. The health effects of simultaneous exposure to chemical stresses (e.g. endocrine disruptors or substances that are difficult to degrade, air pollutants), biological stresses (e.g. GMOs, neobiota) and physical stresses (e.g. noise, vibration, non-ionising radiation (NIR), light) should be estimated and modelled. Methods for risk assessment and monitoring of population exposure over time should be developed and environment-related healthcare costs should be estimated. In nutrition, there are also fundamental synergies between health and planetary compatibility, as shown by studies of NRP 69 and the EAT-Lancet Commission. The question is how these findings can be applied to the demand behaviour of consumers and the public sector, as well as to the supply behaviour of the catering and retail trade.

Also relevant is the interdisciplinary One Health approach, which promotes cooperation between public health, animal health, agriculture and the environment and thus enables interdepartmental measures. Within this framework, the health-promoting direct and indirect effects of the environment on human and animal health should also be researched and quantified. For example: Which natural and landscape elements (green infrastructure, forest) contribute to human physical and mental well-being, and how? Which forms of health-promoting urban design are effective?