1 FSVO research priorities for 2017-2020

1.1 General

The framework for FSVO research is the FSVO's research concept, which is developed for successive four-year periods in parallel with the departmental research concepts by policy area. In terms of content, the FSVO's research needs are derived from its rolling strategy[1] and its specific strategies, and from overarching strategies spanning multiple Offices. The FSVO's specific strategies include the Swiss Animal Health Strategy 2010+, the Nutritional Strategy, and the Animal Welfare Strategy which is currently in development and will be finalised in the course of 2017. Key overarching strategies include the strategy for preventing non-communicable diseases (NCD strategy), the strategy for combating antibiotic resistance (StAR) and the food chain strategy. The FSVO leads the StAR 'animal' subproject.
The research priorities for 2017-2020 define the framework in terms of content for the FSVO's principal research questions over the next four years. The FSVO will use them to formulate targeted calls for tender in priority areas of its responsibility. Applicants will use them as guidelines when formulating and submitting applications. The research priorities will therefore support the process of exploring important questions in a targeted manner and developing answers and courses of action. This will help to fill knowledge gaps within FSVO and key stakeholder groups. The research priorities are sharpened and clarified in the course of the annual planning process.

1.2 Cross-cutting research questions

FSVO research is geared towards application and implementation. Applied research with important application benefits is prioritised. The FSVO also supports projects which may be slightly further away from implementation but provide an important basis for subsequent targeted applied research.
The FSVO's remit covers most of the food chain. The FSVO is therefore the Office best able to link research questions from its individual areas of responsibility, to conduct research according to an integrated approach, and to find comprehensive solutions.
In addition, the FSVO develops synergies with other Offices based on cross-departmental or cross-agency strategies. Cooperation with the FOPH and FOAG is especially important as these Offices are its main partners in strategies such as the food chain strategy, NCD[2] strategy or StAR. The Federal Strategy for Sustainable Development holds special significance for cooperation with other federal offices, as coordination between inherent interests and possible conflicts of aims is of particular importance in this context.
The FSVO is always keen to seize opportunities for working with other Offices involved - with the aim of handling research questions as comprehensively as possible and finding answers that can be implemented in a targeted manner.
In the past, research projects dealing with the **behaviour** of the various actors have often proved difficult to implement in practice. It is therefore vital to clarify the factors that facilitate the implementation of research project findings, as well as the means by which knowledge transfer to stakeholders (e.g. veterinarians, farmers) can be improved.
Other topics which need to be considered in virtually all research questions, but have to be addressed specifically by research field or target audience, relate to **early detection** and **(risk) communication**.

[1] FSVO rolling strategy
[2] NCDs: non-communicable diseases (e.g. cardiovascular disease, cancer, diabetes, musculoskeletal disorders, chronic respiratory disease)

1.3 Food safety, nutrition and commodities

Research in the field of **food, nutrition and commodities** is characterised by the goal of providing a targeted basis for assessing nutrition and the safety of food and commodities in order to protect consumer health as effectively as possible. Known and new risks and opportunities are monitored, investigated and assessed along the entire food chain. The design of research in the area of food, nutrition and commodities follows the traditional classification of risk analysis (e.g. according to the *Codex Alimentarius*). It covers the aspects of risk assessment, risk management and risk communication.
The aim of research in the area of **food and commodities** is to identify health risks and to assess substances, organisms and processes in order to evaluate the safety of food and commodities and thus to protect consumer health as effectively as possible. The aim is also to protect consumers against deception and fraud. Known and new food-related risks are monitored, investigated and assessed along the entire food chain. Close cooperation exists with the area of nutrition.
Research in the area of **nutrition** aims to collect representative data on food consumption and nutritional behaviour. These data form the basis for targeted measures to ensure that the Swiss population enjoys a balanced and healthy diet. Nutrition-related subsequent costs (e.g. NCDs[3]) are an additional aspect of research.

Research objectives

1. Provision of basic data for risk analysis

   Questions connected with the collection, evaluation and analysis of data with the aim of creating a basis for risk assessment.

   Examples:
   - *Determining human and animal exposure to and burden of environmental contaminants and other anthropogenic and natural substances via food and commodities by means of environmental monitoring and human biomonitoring;*
   - *Creating databases on the nutritional and eating habits of the Swiss population (dietary surveys);*
   - *Developing cost-effective, rapid methods for recording nutritional behaviour.*

2. Conceptual basis for risk assessment (methods)

   Developing and refining methods used for efficient, effective risk assessment.

   Examples:
   - *Developing an assessment concept for simultaneous exposure to multiple substances;*
   - *Improving statistical evaluations of animal studies;*
   - *Developing methods for early risk identification.*

3. Conceptual basis (tools) for assessing effectiveness (risk management)

   Developing and refining tools which allow the effectiveness of state action in the field of food and commodities to be assessed.

   Examples:
   - *Developing methods for measuring the effectiveness of state action (official controls) and assessing the impact of risk management measures;*
   - *Gaining knowledge on the basis of analyses and evaluations of data from dietary surveys (menuCH) and implementation of measures in the area of nutritional strategy as well as risk assessments in the area of food safety;*
   - *Analysing the economic impact (cost-benefit analyses) of intervention measures to reduce the risk of diet-related NCDs;*
   - *Developing methods and tools for assessing the effectiveness of environmental and behavioural prevention measures to support a healthy diet.*

4. Conceptual basis for risk perception and communication

3

Developing methods for conveying risks to target groups, to give them potential courses of action, as well as for improving risk perception on the part of consumers.

Examples:

- *Developing methods and media for targeted, effective communication in order to effect, promote and support changes in behaviour.*

The following list defines and ranks the priorities for research in the area of food, nutrition and commodities for 2017-2020. The list will be adapted periodically to the FSVO's needs.

Priorities for 2017

(As at: 16.9.2016)

First priority

- Determining human and animal exposure to natural ingredients of foods (e.g. pyrrolizidine alkaloids, tropane alkaloids, mycotoxins) and commodities (e.g. essential oils, furocoumarins) with health relevance.
- Developing and applying cost-effective, precise methods for recording the nutritional and eating habits of different population groups (e.g. infants, toddlers, migrants).
- Reviewing/improving statistical evaluations of animal studies; dose-response relationships depending on study design.
- Integrating '-omics' methods into regulation.
- Contributing to the development of an assessment concept for simultaneous exposure to multiple substances.
- Developing new, improved methods for measuring allergens in food.
- Developing methods for characterising and measuring the uptake of chemical substances from packaging materials.
- Determining the viability of pathogenic micro-organisms, in particular viruses, in foods and in food production processes (e.g. *Mycobacterium bovis / caprae* in raw milk cheese, hepatitis E virus in meat products).
- Developing methods and media for targeted, effective communication in order to effect, promote and support changes in behaviour.
- Developing cost-effective methods and tools for assessing the effectiveness of environmental and behavioural prevention measures.

Second priority

- Occurrence and frequency of food-borne pathogenic micro-organisms in various foods with a particular focus on viruses.
- Determining human and animal exposure to environmental contaminants and other anthropogenic organic substances via food and commodities.
- Environmental (e.g. water) and human biomonitoring (serum, urine) to determine the burden of the Swiss population with heavy metals (cadmium, arsenic, uranium, etc.) and other (organic) contaminants.
- 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 of using new techniques (e.g. next generation sequencing) in the molecular biological testing of food; developing new methods of species determination (animals and plants).

1.4 Animal health and StAR

In line with the food chain strategy and One Health, research questions in animal health have clear links with other specific areas (. The research priorities are strongly influenced by the research needs derived from the Swiss Animal Health Strategy 2010+ and the federal strategy for combating antibiotic resistance (StAR).

Good herd health care is the cornerstone of good animal health. The principle of **herd health management** should be developed accordingly. To this end, research is required to ensure the effective involvement of stakeholders, 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 there are gaps in disease surveillance, early detection, assessment of new dangers and risks, as well as in 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 accompanying research into the fundamentals of animal diseases and zoonoses. This application-oriented accompanying research should facilitate and/or optimise the eradication and **control** of animal diseases and zoonoses (research into strategy development as well as research into diagnostics and evaluation of control).

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.

There is also a need for research with a view to refining methods and building and using databases in the **One Health** context. This is important for the detection, prevention, surveillance and control of pathogens and diseases which are important for animals, humans, food and the environment.

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

1.5 Animal welfare

It is vital for animal welfare that animals' needs are explored and that especially people who keep and handle animals, but also the general population, have knowledge and understanding of these needs. Research which is characterised by both high scientific quality and high relevance to specific animal welfare problems has the greatest potential to bring about sustainable improvement in animal welfare, and therefore has priority. The FSVO and the cantonal enforcement bodies are currently working on an animal welfare strategy which will be finalised in the course of 2017. This will also support the sharpening of research questions and the formulation of the annual research priorities.
Research in the area of animal welfare is geared to the following fields of action:

- Developing new and improving established methods for recording animal welfare.
- Optimising methods for anaesthesia and the killing of animals.
- Assessing the housing conditions of livestock, domestic animals and wild animals, especially in the light of technical innovations in animal husbandry and societal changes. This includes, at the interface with animal health, assessing new types of housing which are aimed at the effective prevention of (infectious) diseases.

- Impact of new uses, forms of production and technologies on animal welfare (e.g. aquaculture, sports, therapy animals).
- Welfare-related aspects in the breeding of animals.
- Implementation of 3R requirements in animal experiments.
- Studies on societal developments in the context of human-animal interaction.
- Evaluating the impact of existing and future animal welfare regulations on animal welfare.
- New methodological approaches to reinforce the practical implementation of research project findings.