VETERINARY • PUBLIC • HEALTH • INSTITUTE

UNIVERSITÄT BERN

Annual Report 2014 / 2015

Contents

1. Preface

1.1. Gertraud Schüpbach

Head of the Institute

Protecting humans from zoonotic diseases, preventing disease in animals, and animal welfare are important topics in our society. During the last two years the VPHI has been heavily involved in these. The potential hazard of bacteria that are resistant to antimicrobials being transmitted from animals to humans has made media headlines on a regular basis. While more and more new resistant bacteria and resistance determinants are being detected, the question of their importance for the health of animals and humans often remains unanswered. An ongoing project in our institute aims to investigate the association between usage of antimicrobials in animals and the development and spread of resistant bacteria. In the year 2015 the Swiss National Research Program 72 “Antimicrobial resistance – a one health approach” was launched. We hope that the research launched under this program will answer some of the most urgent questions related to this topic.

This report describes the broad range of ongoing activities in our institute. Several important projects were successfully complete during the years 2014 and 2015, including the analysis of data from the Swiss animal movement database and the analysis of data from a large Swiss abattoir. When combined these two studies demonstrate that routinely collected health and production data have great potential for early detection of infectious livestock diseases. However, our studies did point out that currently available methodologies are neither sensitive nor specific enough to reliably detect outbreaks of new, previously unknown diseases in a timely manner. The results of our research on the utility of the abattoir as a source of surveillance data allowed the Swiss Veterinary Service to replace on-farm sampling to demonstrate disease freedom, with sampling at the abattoir. Economic evaluation is becoming increasingly important for decision making in livestock disease surveillance and control. One example of a VPHI project that will provide information for decision making is a project aimed at economically evaluating different strategies for controlling footrot in sheep in Switzerland.

Our current and future goal is to perform innovative and applied research to improve the health and welfare of humans and animals. We would like to thank our numerous partners in academia, veterinary administration and industry who have supported and enabled us to do this very interesting, diverse and valuable work.

1.2. Hanno Würbel

Head of Division of Animal Welfare

After three years of rapid growth of our team, the aim of the last two years was consolidation. This is particularly true for the Centre for proper housing of poultry and rabbits at the Aviforum in Zollikofen (ZTHZ), which is jointly run by the Division of Animal Welfare of the VPHI and the BLV and for which a new management agreement was implemented. This agreement regulates specifically the interface between the academic and regulatory functions of the ZTHZ based on a lean and effective management structure. However, despite consolidation the ZTHZ managed to obtain several big grants during this reporting period. This includes in particular an ANIHWA Project led by Prof. Marian Dawkins at the University of Oxford on the development of an automated welfare monitoring system for broilers using vido analysis of motion patterns at herd level, as well as the Coordination of an EU Cost Action, with the aim to establish a platform for research on the causes of keel bone damage in laying hens and the development of novel solutions to reduce this massive welfare problem.

Apart from this, a particularly exciting development of the past reporting period was that with funds from the Forschungsplattform of our department (DCR-VPH) and the Paul Schwab-Fonds we were able to establish a new sub-group of clinical animal behaviour for companion animals. Since this specialty was included in the list of wanted Professorships by the Fakultätsausschuss in 2015, we aim at establishing clinical animal behaviour over the next 3-4 years such that hopefully this wanted professorship will soon become a real professorship.

I look forward to implementing all of these exciting projects and finish with a big Thank You to all the members of my team without whom none of this were possible.

2. Research

2.1. Research-strategy of the Veterinary Public Health Institute

The Veterinary Public Health Institute operates as part of the Department of Clinical Research and Veterinary Public Health (DCR-VPH) within the University of Bern. Veterinary Public Health (VPH) as a specialty within veterinary science has been gaining importance in recent years. The main priorities within VPH are the prevention and control of diseases, and the improvement of animal welfare. Diseases which can be transmitted from animals to humans either directly or via food are together with animal health and welfare are the most important societal problems being addressed within VPH. The Veterinary Public Health Institute is engaged in several research initiatives within these areas. We conduct our own research, and support other research groups by providing consulting services in study design and biostatistics. We also teach undergraduate and graduate students, and provide professional training for Swiss veterinarians. The following research topics are currently in the focus of the activities of VPHI:

Division VPH-Epidemiology

1. Surveillance and early detection
   Our research focuses mainly on the development and application of novel methods for creating timely information about population health. We focus on syndromic surveillance for animal diseases, as well as the evaluation and improvement of surveillance programs for the Swiss Veterinary Services.
2. Production diseases
   Our main research activities relate to the epidemiology of bovine mastitis, and the improvement of bovine udder health with the aim of reducing antimicrobial usage in dairy cattle. The VPHI also partners in research projects on other production diseases, such as lameness, and other species such as pigs, small ruminants and rabbits.
3. Modelling and risk assessment
   VPHI research activities include the development of epidemiologic and economic models for zoonotic diseases and contagious animal diseases with the aim of improving surveillance and control of these diseases.

The first two research foci are integrated into the Priority Research Program VPH/Herd Health of the Vetsuisse Faculty Bern. Gertraud Schüpbach co-chairs this important research program for the faculty.

Division Animal Welfare

1. Research Center Zollikofen for Proper Housing of Poultry and Rabbits
   The main activities of this center are evaluation of problems with relevance for animal welfare related to the housing of poultry and rabbits. These results form the basis for the evaluation of housing systems as required by the animal welfare legislation. Also, research is

conducted on the scientific basis for the improvement of existing housing systems, as well as for the development of new housing types with improved animal welfare.

2. Animal welfare and ethology
   The objective of this research focus is to elaborate objective, scientifically based criteria for the assessment of animal welfare, the development of welfare oriented housing systems, the diagnosis, prevention and therapy of behavioural abnormalities, as well as for the improvement of animal welfare in animal experiments.

3. Current research projects and partner

3.1. VPHI Epidemiology

3.1.1. Surveillance and Early Detection

Network for Evaluation of One Health (NEOH)

John Berezowski

The Network for Evaluation of One Health (NEOH) is an international COST funded network which aims to enable evaluations of One Health activities and comparison of initiatives as well as informed decision-making and resource allocation. To this end, NEOH plans to deliver:

1. A science-based, standardised framework for the evaluation of One Health;
2. A suite of example evaluations of One Health initiatives;
3. A networked community of experts collaborating to assess the value of One Health;
4. A pool of early-stage researchers trained in performing evaluations of One Health activities.

NEOH focuses on an integrated, interdisciplinary evaluation of One Health activities to enhance the evidence base for the added value of One Health. Activities include the development of an evaluation protocol and guidelines, case studies, comparative analysis, and dissemination. It is an open international network with participants from around the world who are working on One Health and are interested in collaboration, cooperation and networking to promote a common cause.

Staff involved: John Berezowski, Laura Falzon, Luis Gomes do Carmo
Funding source: COST- European Cooperation in Science and Technology
Duration: May 2014 – May 2018

Advancing One Health Surveillance Strategies

John Berezowski

The purpose of the project was to advance the emerging field of One Health Surveillance. An electronic survey of surveillance practitioners from multiple domains was conducted to identify gaps in surveillance to support One Health, and to assess motivation to improve surveillance. The project also aims to develop an international community of practice for One Health Surveillance through a process of identifying Case Studies and One Health Surveillance workshops at the International Society for Disease Surveillance annual conference.

Staff involved: John Berezowski
Funding source: Skoll Global Threats Fund
Duration: December 2014 – December 2015

Development of algorithms for real-time syndromic surveillance to enhance early detection of emerging and re-emerging epizooties and zoonoses

Dr Flavie Vial

Syndromic surveillance "is the near real-time collection, analysis, interpretation and dissemination of health-related data to enable the early identification of the impact (or absence of impact) of potential human or veterinary public-health threats which require effective public health action" (Triple-S definition). Several veterinary syndromic surveillance systems are currently in place in the EU, monitoring data on livestock mortalities, clinical data, abortions, findings from meat control, laboratory test requests etc. The overall goal of this project is to contribute to the development of a system for early detection of emerging and re-emerging diseases in Switzerland by using syndromic data already available for livestock, and by developing pattern recognition algorithms to produce alerts when such pre-selected events occur more often than expected by chance.

Staff involved: Dr Flavie Vial & Rahel Struchen
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: June 2012 – June 2015

The slaughterhouse as data source for monitoring programs of cattle

Sara Schärrer

The project aims to assess the slaughterhouse as a potential data source for cattle monitoring and surveillance programs. To understand the population dynamics of the Swiss cattle population and the distribution of the slaughter animals at slaughterhouses, data from the animal movement database (AMD) was used to build a population model and to analyze the network characteristics of the Swiss cattle industry. The possibility of sampling pre-determined animals in the slaughterhouse, using an algorithm that attributes to every animal a daily actualized status (include in the sample or not) was evaluated.

Staff involved: Sara Schärrer, Anna Fahrion, Martin Reist (VPHI); Jakob Zinsstag (University Basel, Switzerland), Ann Lindberg (University Stockholm, Sweden)
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: April 2011 - May 2014

Application of text mining tools for the use of pathology data in epidemiological surveillance and early detection of animal diseases

Susanne Küker

As recognized in the Swiss Animal Health Strategy 2010+, methods for early detection, based on the increasing abundance of data on animal health stored in national databases, can contribute to valuable and highly efficient surveillance activities. Post-mortem data, available from pathology services, are often under-exploited even though they have the potential to provide valuable information on the causes of death and additional health indicators for various animal species. In addition to their value for veterinarians and farmers (with regard to treatment and prevention options for the affected herd), systematic evaluation of post-mortem data may have great value for nation-wide and international animal health and zoonotic disease early warning systems.

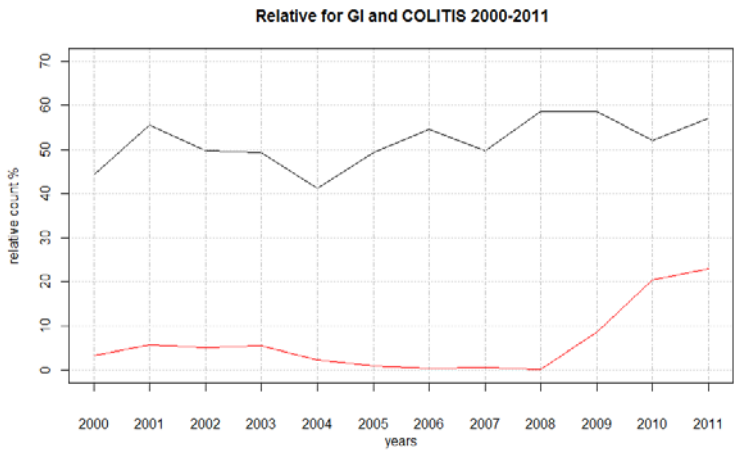
The academic pathology institutes of the Vetsuisse Faculty currently provide most of the veterinary pathology service to the food production sector in Switzerland. The overall goal of this project is to make post-mortem data, recorded at a veterinary pathology institute readily available for epidemiological surveillance especially for the early detection of emerging animal diseases. In particular, this project will focus on the development and evaluation of an automated text-mining and syndrome-classifying tool to: 1) extract relevant information from pathology reports (written in free text) with minimal expert intervention; 2) classify pathology findings into syndromic groups to enhance the efficiency of health event detection.

In a second step these tools will be applied to existing pathology data to test the feasibility for syndromic surveillance using automated evaluations of necropsy data. Additionally, conclusions and recommendations for the setup of pathology data recording systems, which allow automated text mining and data evaluation will be provided

Staff involved: Dr. Flavie Tedder, Dr. John Berezowski, Lenz Furrer, Dr. Horst Posthaus, Dr. Fabio Rinaldi

Funding source: Federal Food Safety and Veterinary Office (FSVO)

Duration: July 2014 – July 2016



The development of Colitis cases in pigs (red line) and pathologic findings general in the gastro intestinal tract (black line) over time, evaluated by a text mining tool.

3.1.2. Production diseases

Modeling of mastitis pathogens

Bart van den Borne

Large numbers of animal movements and sharing of alpine pastures by cows from different herds is common practice in Switzerland. These characteristics of Swiss dairy farming are thought to have a large influence on udder health. The aim of this project is to simulate the dynamics of mastitis causing pathogens within, and between dairy herds and to identify cost-effective intervention strategies at the herd and national level.

Staff involved: Bart van den Borne, Laura Falzon, Beatriz Vidondo, Sara Schaerrer (VPHI) and Tariq Halasa (Technical University of Denmark)

Funding source: Department of Clinical Research and Veterinary Public Health, Vetsuisse Faculty, University of Bern
Duration: August 2012 – August 2016

Preferences of farmers and veterinarians for the design of a Swiss national udder health program

Bart van den Borne

A considerable volume of new scientific knowledge about mastitis in Switzerland has been gathered in the last couple of years. This knowledge has the potential to support a new voluntary udder health/antimicrobial usage reduction program in Switzerland. The opinions of farmers and veterinarians towards a new national udder health program are considered to be crucial to the success of the program. However they have not yet been determined. The aim of this project is to determine the preferences of farmers and veterinarians for the design of a new Swiss national udder health program.

Staff involved: Anna Schwendner, Bart van den Borne, Gertraud Schüpbach (VPHI), Michèle Bodmer (Ruminants Clinic, University of Bern), Marie-Eve Cousin (Consumer Behavior, ETH Zurich), Theo Lam (Utrecht University, the Netherlands), and Henk Hogeveen (Wageningen University, the Netherlands)
Funding source: Federal Food Safety and Veterinary Office
Duration: October 2013 – June 2015

A randomized field trial to reduce sales of intramammary antimicrobials in veterinary practices

Bart van den Borne

Antimicrobial use in dairy herds is most commonly applied intramammary, and is aimed at treating and managing mastitis. The aim of this randomized field trial is to investigate an intervention at the veterinary practice level for decreasing the sales of intramammary antimicrobials to dairy farmers. Veterinarians will be supported in transitioning their approach to mastitis management from curative individual patient care to preventive herd health management.

Staff involved: Bart van den Borne, Gertraud Schüpbach (VPHI), Valerie Pucken, Michèle Bodmer, and Adrian Steiner (Ruminants Clinic, University of Bern)
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: September 2015 – August 2018

Influence of veterinary herd health management on antimicrobial use on pig farms with regular antimicrobial use – economic evaluation of costs and benefits of antimicrobial reduction due to targeted veterinary herd health management (FitPig)

Christina Nathues

This study is part of the "FitPig" project; a collaboration between various institutional partners (https://www.hafl.bfh.ch/forschung-dienstleistungen/agrarwissenschaften/nutztiersysteme-und-pferdehaltung/schweine-fleischqualitaet/fitpig.html). Within this framework, approximately 110 Swiss pig breeding farms and 110 fattening farms will be visited and data about antimicrobial use, management practices, production data and attitudes of the farmer will be collected. In the

retrospective part of the project (case-control study), management practices of farms with and without regular preventive antimicrobial use will be compared. For the prospective part of the project (intervention study), about 80 breeding and 80 finishing farms with regular preventive use of antimicrobials will be allocated either to a control group (without extra veterinary assistance) or to an intervention group (with targeted veterinary herd health management). Approximately one year later the farms will be revisited and the two groups compared with respect to antimicrobial use, animal health, and productivity. The role of the VPHI in the study is to evaluate the economics of reducing antimicrobial usage for the intervention group of the prospective study. The additional costs for veterinary herd health management and for the implementation of recommendations and lost benefits due to a potential reduction in animal health and productivity will be compared to the additional benefits due to a possible increase in animal health and productivity, and the reduced costs for veterinary interventions and antimicrobial treatments.

Staff involved: Christina Nathues, Gertraud Schüpbach, Beatriz Vidono
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: ongoing until the end of 2017

3.1.3. Modeling and risk assessment

Prioritization of zoonotic agents in Switzerland for their surveillance and control

Stebler, Nadine

The Swiss Food Safety and Veterinary Office (FSVO) identified the need to reclassify zoonotic diseases based on their potential harm to humans and animals. A list of criteria relevant for disease weighting was compiled based on a thorough literature search. These criteria were evaluated and weighted by experts in the FSVO in a modified Delphi panel. In a second step, a conjoint analysis questionnaire was developed to obtain weighting scores for some of these criteria based on health professional and student opinion. These weightings were then used to rank 16 selected notifiable or emerging zoonotic diseases. Results from this study have contributed to discussions on future resource allocation for disease control and prevention in Switzerland.

Staff involved: Gertraud Schüpbach, Laura Cristina Falzon, Peter Braam (BLV)
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: March 2013 to February 2015

Die Karten und Pfeile, die während der Expertenbefragung mittels einer modifizierten Delphi-Methode für die Gewichtung der Kriterien angewendet wurden. The cards and arrow used for weighting disease criteria during the modified Delphi panel with the experts.

Joint residents´ project: A Systematic Review of the added benefit of a One Health approach to study complex health issues

Falzon, Laura

This project is a collaborative effort of several European College of Veterinary Public Health Residents from across Europe. The goal of this review is to identify and summarize those studies which report a quantitative benefit when using a “One-Health” approach to investigate complex animal and human health issues. Results from this study will provide tangible measures that can be used to evaluate future One Health endeavors.

Staff involved: Isabel Lechner, Ilias Chantziaras, Merel Postma, Maria-Eleni Filippitzi, Gerty Vanantwerpen (Ghent University), Lucie Collineau, Jorge Pinto Ferreira (SAFOSO, Switzerland), Aurélie Courcoul (University Paris Est), Riikka Laukkanen-Ninios (University of Helsinki), Carole Peroz (Ecole Nationale Vétérinaire, Agroalimentaire et de l'Alimentation Nantes-Atlantique), Pia Prestmo (University of Bristol), Clare Phythian (NMBU, Norway), Eleonora Sarno (University of Zurich), Timothée Vergne (Royal Veterinary College), Douglas Grindlay, Marnie Brennan (University of Nottingham)
Funding source: Not applicable
Duration: October 2013 to March 2016

A systematic review to determine the correlation between human and livestock Brucella sero-prevalence

Falzon, Laura

Brucellosis is an important zoonotic disease worldwide. It is caused by a Gram-negative bacterium, and while there are several species, the most important from a public health perspective are *Brucella melitensis* and *B. abortus.* These commonly infect small ruminants and cattle respectively, though spill-over in other hosts is often reported. Human sero-prevalence rates associated with *B. melitensis* have been found to be higher, compared to human sero-prevalence rates associated with *B. abortus*, suggesting that *B. melitensis* may be more virulent for human beings. However, information on the

correlation between human and livestock brucella sero-prevalence, based on the bacterial species present and livestock species involved, is generally lacking. This systematic review is being conducted to determine the correlation between human and livestock *Brucella* sero-prevalence, stratified by livestock (cattle, sheep, goat and camel) and bacterial (*B. melitensis* and *B. abortus*) species.

Staff involved: Esther Schelling (Swiss Tropical and Public Health Institute, Switzerland), Tyler O'Neill (Dalla Lana School of Public Health, Toronto).
Funding source: SpezKo grant (Commission of Specialization at the University of Bern, Switzerland)
Duration: January 2015 to June 2016

A pilot project to evaluate the feasibility of using the Fluorescence Polarization Assay as a rapid on-spot test for brucellosis in ruminants

Falzon, Laura

Brucellosis, an important zoonotic disease, is usually diagnosed through serological tests, such as the Rose Bengal Test, or molecular methods, such as Polymerase Chain Reaction. More recently, the Fluorescence Polarization Assay was introduced as a diagnostic test for brucellosis. The advantage of this test is that it can be performed on location, allowing for a more rapid identification of positive animals. However, the feasibility of using this test and its performance in different working environments has yet to be evaluated. The objective of this study was to evaluate the feasibility and performance of the Fluorescence Polarization Assay as a screening test for brucellosis in ruminants in Côte d'Ivoire.

Staff involved: Esther Schelling (Swiss Tropical and Public Health Institute, Basel), Sylvain Traoré, Bassirou Bonfoh (Centre Suisse de Recherches Scientifiques en Côte d'Ivoire)
Funding source: SpezKo grant (Commission of Specialization at the University of Bern, Switzerland)
Duration: January 2015 to June 2016

Laura Falzon processing blood samples for the Fluorescence Polarization Assay at the abattoir in Abidjan, Côte d'Ivoire.

Antimicrobial usage and resistance in food animals – temporal trends and relevance for public health

Luís Pedro Carmo

The main objective of this study is to analyze the temporal evolution of antimicrobial resistant bacteria in food producing animals (cattle, pigs and poultry), with respect to the usage of antimicrobials. Analyzes will be performed taking into account animals species, different antimicrobial classes and also bacterial species.

Staff involved: Luís Pedro Carmo, Ioannis Magouras, Gertraud Schüpbach
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: February 2013 to March 2016

Economic and epidemiologic evaluation of disease control in Switzerland: caprine arthritis encephalitis (CAE) surveillance and control and eradication program for bovine viral diarrhea (BVD).

Beat Thomann

The overall aim of this project is to develop infectious disease and economic models to evaluate the cost effectiveness of the two surveillance programs currently implemented in Switzerland and to provide alternative control strategies that will improve efficiency and resource allocation.

Staff involved: Ioannis Magouras, Laura Falzon, Giuseppe Bertoni, Barbara Häsler, Gertraud Schüpbach
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: 2013 - 2016

Last known case of a goat with clinical CAE (picture: H.R. Vogt, 1998)

Retrospective evaluation of emergency vaccination for the foot-and-mouth disease outbreak of 1965/66 in Switzerland

Dana Zingg

The last important outbreak of foot-and-mouth disease (FMD) in Switzerland took place in 1965/66. The outbreak affected more than 900 premises and more than 50,000 animals were slaughtered to control the outbreak. Large scale emergency vaccination was applied to control the epidemic. This study aims to evaluate whether a spatial, stochastic simulation model (the Davis Animal Disease Simulation model) can predict the course of the epidemic based on the available historic input data on population structure, contact rates, epidemiology of the virus and quality of the vaccine. In addition, the potential outcome of the 1965/66 FMD outbreak without application of vaccination was investigated. The simulation model output indicated that the use of nation-wide mass vaccination was essential for controlling the large FMD epidemic.

Staff involved: Salome Dürr, Gertraud Schüpbach, Stephan Häsler (Swiss Association for the History of Veterinary Medicine), Heinzpeter Schwermer (Federal Food Safety and Veterinary Office)
Funding source: -
Duration: 2014-2015

Control of foot-and-mouth disease in Switzerland in 1965/66.
Photo: Archiv SVGVM (Schweizerische Vereinigung für Geschichte der Veterinärmedizin)

Evaluation of the economic impact of foot-rot and cost-effectiveness of a nation-wide control strategy in the Swiss sheep population (subproject epidemiological modelling)

Dana Zingg

Foot-rot is a contagious disease of cloven-hoofed animals. It affects the claws of sheep and leads to poor performance and reduced welfare. Legal provisions for the control of the disease only exist in some regions of Switzerland. Imbedded in a larger project to assess the possibility of controlling foot-

rot nationally in Switzerland, the present study aims to model the impact of different control strategies on the prevalence of foot-rot in Switzerland. The effect of different control strategies will be compared with the currently applied strategy in order to estimate changes in prevalence over time. The outcome of the model will be incorporated into a cost-benefit analysis.

Staff involved: Salome Dürr, Gertraud Schüpbach, Agecon ETH Zurich
Funding source: Federal Office of Food Safety and Veterinary Office, Federal Office for Agriculture
Duration: 2015-2016

Foot-bath as one of the main measures to control foot-rot in infected sheep flocks.
Photo: Deborah Greber, Vetsuisse Bern

Estimation of potential spread and impact of canine rabies in Australian Aboriginal communities by novel simulation model approach (rabies modelling)

Salome Dürr

Domestic dog rabies is an endemic disease in large parts of the world and also epidemic in previously free regions. Disease spread models are useful tools to provide evidence for the most effective disease control strategies and to inform policy decisions. We are developing a stochastic, spatially explicit rabies simulation model within a rabies free region, informed by data collected in Indigenous communities in northern Australia. Initial outcomes suggest that vaccination with 70% coverage would significantly reduce size of outbreaks, while the other strategies only show a slightly positive effect when applied at high levels (50% culling of the dog population and 80% compliance to dog confinement).

Staff involved: Salome Dürr, Michael Ward (The University of Sydney)
Funding source: Swiss National Science Foundation
Duration: 2013 - 2016

Two of the study dogs in Galiwin'ku, an Aboriginal community in Northern Australia
picture: Salome Dürr

Reorganization of the PRRS surveillance program: freedom from disease and earlier detection

Stéphanie Samartin, Christina Nathues

In contrast to surrounding countries, the Swiss pig population is considered to be free from *Porcine Respiratory and Reproductive Syndrome* virus (PRRSV). Freedom from PRRSV in Switzerland is monitored through an official surveillance program which focuses on fattened pigs at slaughterhouses. However, with this program, the introduction of PRRSV in herds can only be detected after a certain period of time. In fact, in 2012 and 2014, outbreaks of PRRSV were detected in Swiss breeding herds. For this reason an analysis determining the proportion of breeding herds that could be covered through the current surveillance program was conducted. Based on the results, an additional sampling program targeting breeding herds was designed, which would

complement current surveillance and facilitate earlier detection of PRRSV incursions. This additional sampling of pigs from breeding herds was conducted in late 2015. The results are currently being analyzed to determine the proportion of breeding herds actually covered by this sampling program, as well as the sensitivity and costs of the entire surveillance program. To optimize future surveillance of PRRSV, other potential surveillance components will be evaluated in a scenario tree model.

Staff involved: Gertraud Schüpbach (VPHI), Heinzpeter Schwermer (BLV), Jürg Danuser (BLV)
Funding source: VPHI
Duration: April 2015 – March 2016

An economic model to estimate the costs of PRRSV infection and evaluate different control strategies at individual farm level

Christina Nathues

Porcine Reproductive and Respiratory Syndrome virus (PRRSV) is among the pathogens with the highest economic impact in pig production worldwide. Yet, the economic impact of the disease at the farm level is not well understood as, especially in chronically infected herds, the losses caused are often not obvious to farmers and veterinarians. The first aim of this study is to develop an epidemiological and economic model to determine the costs of PRRSV on an individual pig farm. The broad variety of available control options such as different vaccination and elimination protocols makes is difficult to decide on the best strategy for a specific farm. Thus, the second aim of this study is to develop a tool to model the economic efficiency of different strategies to control PRRSV at the individual farm level. The stochastic baseline model will estimate the effect of PRRSV infection on health and productivity in a specific industry setting (adjustable for different farm types, herd sizes, types of batch farrowing etc.). Financial losses will be calculated in a gross margin and partial budget analysis. In this model different intervention scenarios will be incorporated with their degree of improvement in certain parameters and their probability of success. The economic efficiency of each scenario will be assessed over a period of 5 years through investment appraisals and the resulting expected value will be used to identify the most cost-effective strategy.

Staff involved: Heiko Nathues (Swine Clinic), Gertraud Schüpbach (VPHI), Pablo Alarcon (RVC London), Jonathan Rushton (RVC London)
Funding source: Merck Animal Health
Duration: August 2014 – March 2016

3.1.4. Other topics VPHI-Epidemiology

Herd-based risk index assessment as a tool to assess the feasibility of an eradication program for the Porcine Reproductive and Respiratory Syndrome (PRRS) in Upper Austria

Lechner, Isabel

PRRS is still sporadically found in domestic pig holdings in Upper Austria. For this project an analysis of a dataset comprising all pig holdings in Upper Austria was performed. A herd-based risk index

(Fahrion et al. 2014) was calculated to assess the feasibility of eradicating PRRS from Upper Austria. In addition data from a questionnaire will be used to identify holding-specific risk factors for the introduction of PRRS.

Staff involved: Gertraud Schüpbach (VPHI); Heiko Nathues (Clinic for pigs, Vetsuisse Faculty Bern); Isabel Hennig-Pauka & Lukas Schwarz (University of Veterinary Medicine Vienna)
Funding source: VetmedUni Vienna
Duration: January 2015 - ongoing

Association of clinical signs after acute Schmallenberg virus (SBV) infection with milk production and fertility in Swiss dairy cows

Lechner, Isabel

This study investigated the association between clinical signs, production and fertility parameters in Swiss dairy cows during the Schmallenberg Virus epidemic during the summer of 2012. The analysis was performed at the animal-level, which allowed the study to draw conclusions about production losses and the impact on fertility at the individual animal. Clinical animals showed a remarkable drop in milk yield compared to non-clinical animals and milk Somatic Cell Count (SCC) was highest in clinical animals during the Schmallenberg Virus epidemic period. The number of inseminations was highest in clinical animals during the epidemic. No difference could be found for the NR56, either between animal subgroups or different time periods.

Staff involved: Gertraud Schüpbach, Bart van den Borne (VPHI); Marianne Wüthrich, Mireille Meylan (Ruminant-Clinic, Vetsuisse Faculty Bern)
Funding source: Federal Food Safety and Veterinary Office (FSVO) and VPHI
Duration: June 2014 to May 2016

MRI and CT of brain lesions in water buffalo and cattle stunned with handguns or captive bolts

Lechner, Isabel

Approximately 300 water buffalo are slaughtered every year in Switzerland. Current stunning procedures for water buffalo lack animal welfare and occupational safety standards. This study investigated brain lesions of water buffalo after stunning with captive bolt or handguns. Brain lesions in buffalo were compared to the anatomical specifics of cattle, using CT and MRI. Significant differences in hide thickness, sinus width and distance from the frontal point of entry to the Thalamus were found. Also, anatomical differences regarding age and sex of water buffalo were identified. The outcome of this study will be used to develop a stunning device that allows effective and safe stunning of water buffaloes.

Staff involved: Barbara K. Schwenk, Michael H. Stoffel (ITA, Vetsuisse Faculty Bern); Steffen G. Ross, Dominic Gascho (IRM, University of Bern); Beat P. Kneubuehl, Matthieu Glardon (IRM, University of Zürich)
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: October 2013 to August 2015

Development of an e-Learning module ”epidemiological measures“ for students based on a fictional case study on leptospirosis in dogs

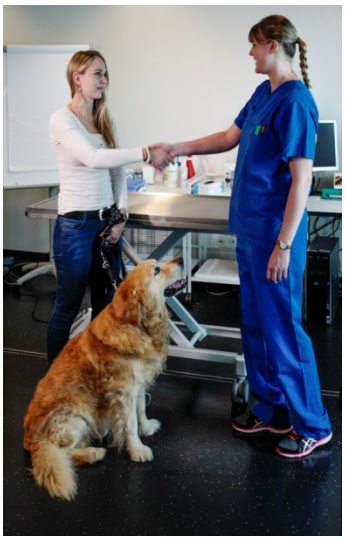
Sabine Wanda

Epidemiology is the study of disease patterns in defined animal and human populations. Diseases vary in their cause, spread and chances for recovery; and not every animal or person has the same probability to become diseased. Epidemiological measures are used to describe the frequency and dynamics of a disease. Prevalence, incidence, mortality and lethality are such measures.

The objective of the course module was to give first year veterinary students a basic understanding of epidemiology, in particular: disease, population and outcome measures, based on a fictional case study of leptospirosis in dogs.

The goal was achieved by developing an e-Learning tool for veterinary students. The project team included the small animal clinic, SAFOSO AG and Epi-interactive. The storyboard contained a role play between a veterinarian and a dog owner and tells the story of the sick dog “Endro”, suspicious of having leptospirosis. The case study has a strong focus on the Swiss disease situation and provides not only epidemiological information through a very practical approach, but also a lot of background information on leptospirosis. Information is provided in the form of videos, photos, written text, articles and motion graphics. A self-test allows students to test their knowledge on the topics. The module will be made available on the VPHI homepage.

Staff involved: Sabine Wanda, Gertraud Schüpbach, Katharina Stärk (SAFOSO AG), Ulrich Müllner (epi-interactive), Kuno Sorgen (cameraman), Matthias Wäcklin (photographer), Ariana Schweighauser (small animal clinic), Corinne Gloor (small animal clinic), Larissa Baumer (small animal clinic), Thierry Francey (small animal clinic) und Golden Retriever Endro.
Funding source: VPHI
Duration: January – December 2015



Influence of water quality parameters on the occurrence of Polycystic Kidney Disease (PKD) in Swiss brown- and rainbow trout

Lechner, Isabel

PKD plays an important role in the decline of trout in rivers in Switzerland. The aim of this study was to investigate the influence of water quality parameters on the occurrence of PKD. Approximately 800 fish from 44 rivers were caught and histopathologically examined. By the means of a statistical model, the association between biological, chemical and physical characteristics of the river sites and the occurrence of PKD will be further assessed.

Staff involved: Slavica Katulic and Thomas Wahli (FIWI, Vetsuisse Faculty Bern); Bart van den Borne (VPHI)
Funding source: Federal Office for the Environment (FOEN, histological examination of fish)
Duration: February 2014 - ongoing

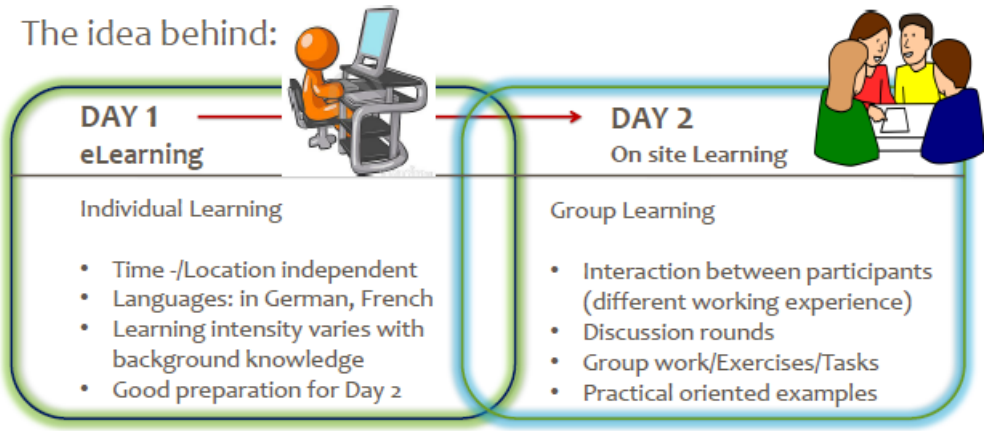
"eATA": Development of an e-learning module for official veterinarians

Sabine Wanda

In Switzerland, veterinarians undergoing training to become an official veterinarian must complete a module in epidemiology which covers Risk Analysis, Monitoring and Surveillance, and Outbreak Investigation (RAMSOI).

As an alternative to face-to-face teaching, a blended learning approach which combines e-Learning ("eATA") and face-to-face learning was developed. Six e-Learning units, a web tool for sample size calculations, a quiz, and a self-test were developed in German and French on the "ILIAS" platform and made available to a target group of 20-25 people ranging in age from 25 to 55.

The objective of the study was to develop an e-Learning tool for RAMSOI that would allow veterinarians to participate in the first day of the module remotely, on their own, and at their own pace. Completing the e-learning component prepares participants for day 2 of the module where they can apply the new "eATA" knowledge in exercises, discussion rounds and work in face to face group exercises. The "eATA" was run for the first time in autumn 2015.



Staff involved: Sabine Wanda, Gertraud Schüpbach, Katharina Stärk (SAFOSO AG), Ulrich Müllner (epi-interactive), Martin Reist (FSVO)
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: January - September 2015

Qualitative risk assessment for Infectious Laryngotracheitis (ILT) transmission from backyard flocks to professional poultry farms in Switzerland

Sabine Wanda

In western Switzerland, ILT outbreaks can occur with no known source of infection, and these lead to concerns among commercial poultry producers. Backyard poultry flocks are a possible source for ILT virus that may be transmitted to commercial poultry farms. The purpose of this study was to assess this risk.

The risk analysis included data and information collected on ILT prevalence in backyard flocks and hobby farms, possible risk factors for transmission and transmission pathways between housing systems, criteria for defining backyard and professional farms, and recommendations for risk reduction. Subsequently, a follow up study was conducted for the period 2010-2015 for the 16 cantons affected by ILT outbreaks in commercial poultry farms.

Staff involved: Sabine Wanda, Gertraud Schüpbach, Ruth Hauser (BLV), Lukas Perler (BLV), Richard Hoop (NRGK), Michael Binggeli (BLV), Cordia Wunderwald (BLV), Mainity Batista-Linhares (BLV), Urs Zimmerli (BLV), Martin Wyss (small animal association CH), Walter Gloor (small animal association CH), Harald Schliessnig (QGV, AT), veterinary office representatives of 16 Kantons
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: March 2014 – November 2015

3.2. Animal Welfare

3.2.1. Animal Welfare and Ethology

Play behaviour, emotional state and emotional contagion in rats

Jessica Lampe, Luca Melotti

Social play is considered a promising indicator of animal welfare, yet systematic studies are still lacking. To further investigate how social play may be used for the assessment and improvement of animal welfare, this project aimed to study the relationship between play and emotional state as well as whether play is emotionally contagious.

Playfulness was assessed based on a Play-in-Pairs test, play behaviour in the home cage and behaviour in response to tickling by the experimenter. We found that the Play-in-Pairs test provided the best measure of playfulness, as it showed consistency across motivational contexts and time.

To further examine the relationship between play and (positive) emotional state we developed a novel task and refined an existing one to assess cognitive biases, and used both tasks to investigate relationships between (positive) mood and playfulness (data are now being analysed).

One experiment investigated whether positive emotional states are reflected in facial expressions. For this purpose rats were exposed to an emotionally positive (playful tickling by the experimenter) and a moderately negative contrast treatment (intermittent bursts of white noise). It was found that the colouring of the ear and the angle between the ear and the skull varied consistently in response to the emotionally valenced situations.

In another experiment we investigated whether individual playfulness affects play behaviour of cage mates by grouping rats with cage mates of either similar or dissimilar playfulness. It was shown that homogeneous groups initially played more than inhomogeneous groups, however, play decreased across time in homogenous groups, this was not the case in inhomogeneous groups.

To investigate short-term emotional contagion, one rat per cage received a positive treatment (tickling by the experimenter or chocolate food rewards) and it was recorded how the treated rat affected play levels and positive vocalizations in the home cage immediately after the treatment. Data are currently being analysed.

Finally, to further unravel the link between playfulness and welfare, we studied whether individual differences in playfulness are associated with differences in coping with challenge. Challenges included novel environments as well as learning tasks and problem-solving tasks. Data are currently being analysed.

These results on playfulness, emotional valence and emotional contagion aim to expand our understanding of the relationship between play behaviour and animal welfare as well as the underlying mechanisms linking the two.

Staff involved: Jessica Lampe (PhD student), Kathryn Finlayson, Paula Ospitia, Sabrina Ruchti, Eimear Murphy, Sara Hintze, Janja Novak, Oliver Burman (University of Lincoln, UK), Hanno Würbel, Luca Melotti (project leader)

Funding source: Swiss National Fonds
Duration: February 2013 to January 2016

A rat being tickled by the experimenter

Emotions in horses: Validating behavioural indicators of emotional valence

Sara Hintze

The primary aim of this project is to detect and validate indicators of emotional valence in horses. A further goal is to examine the general approach of detecting and validating behavioural indicators of emotional valence, using horses as model animals, through investigating the associations between spontaneous variation in behaviour and judgement bias.

To this end, we investigate how positively- and negatively-valenced situations affect different aspects pf behavioural expression, including eye wrinkles, facial expressions, and body language. Wrinkles above the eye ball are caused by contraction of the inner eyebrow raiser. Such wrinkles are common in horses, and while there are differences in the degree of expression between and within individuals, they are more strongly expressed when horses are in pain. In humans, contraction of this muscle is associated with worry and sadness. To determine whether eye wrinkle expression reflects emotional valence in horses, we have developed a scale to reliably assess various components of eye wrinkle expression. One such component, the angle between a horizontal line through the eyeball and the highest wrinkle, was found to respond selectively to positive and negative situations: positive situations were associated with narrower angles, while negative situations were associated with wider angles compared to control situations. Similarly, the presence or absence of eye white was related to situation, with a tendency for fewer horses showing eye white in positive than in negative situations.

Different methodological approaches were used for the assessment of facial expressions and body language, including the Equine Facial Action Coding System, the Horse Grimace Scale, and Qualitative Behaviour Assessment.

In order to validate promising parameters as indicators of emotional valence, we are currently developing a novel judgement bias task. Investigating the association between spontaneous variation in behaviour and judgement biases could be a promising step towards on-site monitoring of horses' emotional states and may, therefore, greatly advance the assessment of horse welfare.

Staff involved: Sara Hintze (PhD student), Samantha Smith, Petra Schnyder, Maria Boada Saña, Iris Bachmann, Hanno Würbel (project lead)
Funding source: ALP-Haras
Duration: March 2013 to August 2016

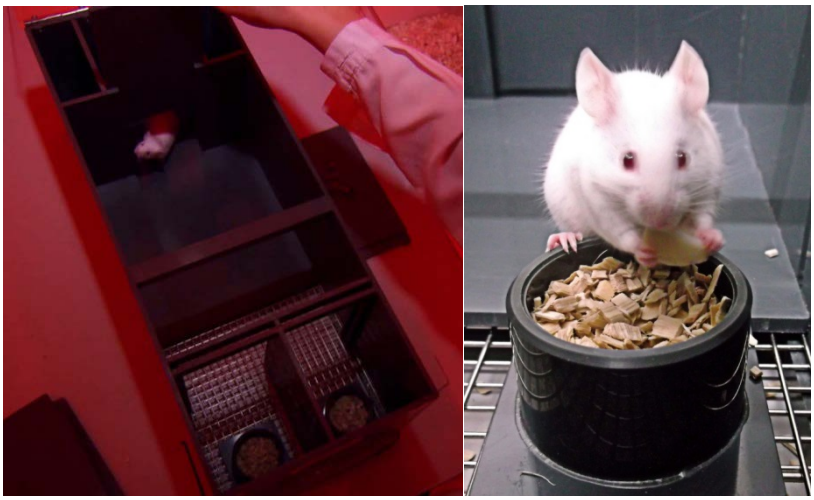
Eye wrinkles in horses: No or only very subtle wrinkles above the eye ball (left); strongly expressed wrinkles forming a sharp angle above the eye ball (right).

Stereotypies, neurological integrity and welfare in laboratory mice

Janja Novak

Stereotypies are the most common form of behavioral problems in animals in captivity. They are generally associated with impaired brain function and negative affective states and are therefore considered as indicators of impaired welfare. The aim of this project was to develop, validate and use behavioural methods to test whether stereotypies in laboratory mice reflect impaired behavioural inhibition (recurrent perseveration) or cognitive biases which are indicative of positive or negative affective states. Our results mirror findings found in other species, in that only some forms of stereotypies were associated with recurrent perseveration or associated with negative cognitive biases. The implications of stereotypies for the welfare of laboratory mice therefore depend on both the form and expression level of the stereotypy.

Staff involved: Janja Novak (PhD student), Jeremy Bailoo, Luca Melotti, Hanno Würbel (project lead)
Funding source: Deutsche Forschungsgemeinschaft (DFG)
Duration: December 2011 to October 2014



Two choice guessing task to measure impaired behavioural control (recurrent perseveration)

Sensory Processing Sensitivity, behavioural and health problems in dogs

Maya Bräm Dubé

With the focus on personalised medicine increasing in the human field, the interest in individual differences in veterinary medicine has been growing as well. The personality trait of high sensitivity ("sensory processing sensitivity", SPS) has recently been described in humans, which - in combination with environmental factors - can lead to an increased vulnerability for psychological and (stress-related) physiological suffering (such as depression and allergies). The aim of this project is to study SPS in dogs and to validate a means to evaluate it. As highly sensitive dogs are suspected to be less stress tolerant, we expect them to be more sensitive to stress-related illnesses and to respond more strongly to measures of stress-reduction. As high sensitivity in humans has been linked to different ways cognitive and emotional information processing, we are also studying the interaction of this personality trait with types of communication- and training methods in dogs.

The results up to now confirm our hypothesis that a personality construct, similar to SPS in humans, can be measured in dogs. A questionnaire was developed that showed good construct validity and reliability in a large-scale online study. External factors (such as owner personality, country of residence, etc.) and dog factors (such as breed, sex, age, etc.) only influenced the variability to a small degree. Associations of SPS with behaviour and health problems, and consistency of SPS across time, are still being analysed.

Staff involved: Maya Bräm Dubé (project lead), Sibylle Furrer, Marcus Doherr, Isabel Lechner, Lucy Asher (University of Newcastle, UK), Hanno Würbel, Luca Melotti
Funding source: Margaret und Francis Fleitmann Stiftung
Duration: February 2013 to January 2016

Confrontation with a novel object and a novel scent

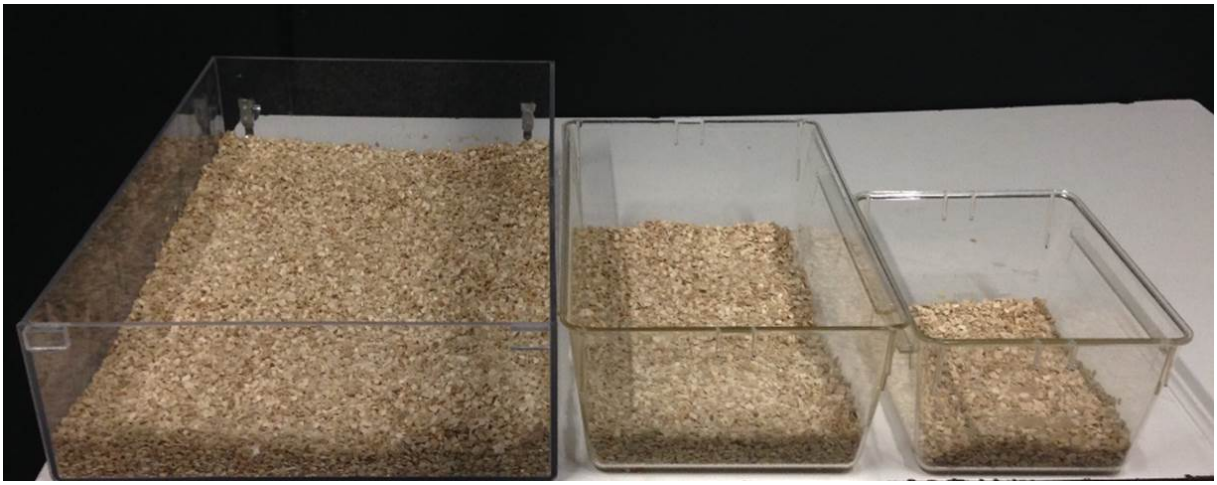
3R – Refinement of animal experimentation

How does variation of floor area, group size, and stocking density, respectively, affect the welfare of laboratory mice?

Jeremy Bailoo

Previous studies investigating the space needs of laboratory mice yielded mixed findings, with some studies indicating that the number of mice per cage (stocking density) may be increased 2-fold without noticeable effects on welfare, while others found adverse effects; yet none of these studies varied the relevant factors (floor area, group size, stocking density) systematically. The current study addressed this knowledge gap and varied group size (3, 5, 8) and floor area (370, 820, 2400 cm2) in a full factorial design using two strains of mice (Balb/c, C57BL/6) and both males and females. We measured rates of attrition due to mice reaching predefined humane endpoints of health and wellbeing, food and water disappearance, and body weight weekly, anxiety-like behaviour in an open field over four days, and glucocorticoid metabolites across four time points. We observed differences primarily in regards to group size, but these differences were in part strain and sex specific. Specifically, as group size increased, overall levels of attrition increased (56%), mostly due to overt aggression among males of one strain (Balb/c). Moreover, as group size increased, rates of feeding and drinking per mouse decreased. No other differences were observed. Our findings indicate that space itself may not be the crucial factor for the wellbeing of laboratory mice. Group size seems to be more important but its effects on social dynamics may vary greatly depending on the sex and strain of the mice.

Staff involved: Jeremy Bailoo, Eimear Murphy, Justin Varholick, Janja Novak, Rupert Palme (University of Veterinary Medicine Vienna), Hanno Würbel (project lead)
Funding source: European Research Council (ERC) Advanced Grant “REFINE”
Duration: September 2014 to May 2015



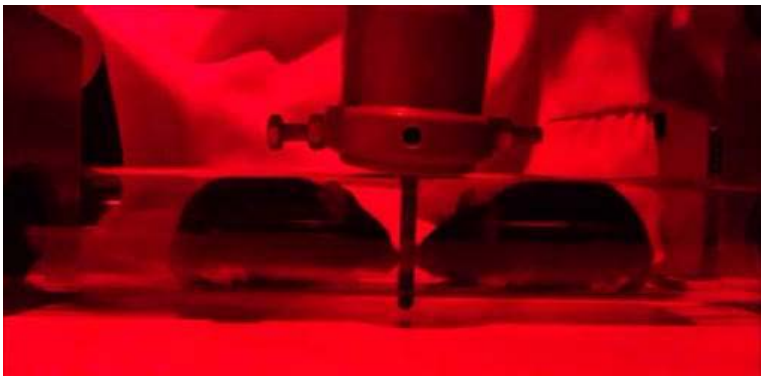
From left to right, a custom built cage meeting the minimal space requirements for pet mice (2400 cm^2) and two standard laboratory mouse cages, Makrolon Type 3 cage (820 cm^2) and Makrolon Type 2 cage (370 cm^2).

Social dominance ranks and their relation to phenotypic differences in groups of mice

Justin, Varholick, Jeremy Bailoo

The mouse, *Mus musculus*, is by far the most widely used animal in biomedical research. Despite its prevalence, the behavioural biology of the mouse is often neglected. For example, in order to control for cage effects, one mouse per cage may be randomly selected. However, mice may form a dominance hierarchy where phenotypic differences may emerge as a consequence of dominance rank. Thus, randomly selecting an individual per cage may inadvertently exacerbate variation in experimental results if individuals of different ranks are tested between cages. The current study investigated whether (i) dominance hierarchies are present and stable across three time points and, (ii) whether mice of different dominance ranks exhibit different behavioural phenotypes. Using the competitive exclusion test, the dyadic dominance relationship for each pairing of mice per group was measured once per week over 3 consecutive weeks. Following the second week of dominance tests, mice were individually tested in an elevated zero maze. Preliminary data analyses indicated that only 60% of groups showed linear hierarchies across time. Thus, assessment of the relation between rank and phenotype remained difficult because unstable hierarchies were observed. Nevertheless, our data indicated that rank and rank stability may affect exploratory behaviour in the zero maze, and that this effect may depend on sex.

Staff involved: Justin Varholick (PhD student), Jeremy Bailoo (supervisor), Hanno Würbel (project lead)
Funding source: European Research Council (ERC) Advanced Grant “REFINE”
Duration: February 2015 to December 2015



Competitive exclusion test, also known as tube test; the socially higher ranked mouse is pushing the mouse ranked lower in the rank order out of the tube.

Multi-PART

Hanno Würbel

The overall objective of Multi-PART (Multicentre Preclinical Animal Research Team; www.Multi-PART.org) was to develop the capacity to undertake international multicentre animal studies.

Unfortunately, developing effective therapies to treat neurological disorders has proven challenging. Ischaemic stroke is probably the most studied example of this translational failure. More than 1000 drugs have proven to be effective in animal models of focal cerebral ischaemia but only thrombolysis with tPA has shown to be an effective therapeutic, albeit in a small proportion of patients. A number

of explanations have been proposed by the field for such translational failures. First, it has become apparent that many animal studies are confounded by bias that limits their validity. Further, these studies that do not report measures to reduce risks of bias have been shown to overstate treatment effects. There is also evidence from secondary analyses of in vivo data of substantial publication bias and selective outcome reporting bias across the modelling of human diseases. Doubts have been cast on the validity and usefulness of the animal models used and substantial differences between animal and human studies have, in part, been faulted. These issues have been exacerbated by the waning enthusiasm of pharmaceutical companies to invest in the search for effective therapies for ischaemic stroke. Our proposal was to address many of the shortcomings in translational stroke research by providing a platform to perform international, centrally coordinated phase-III like preclinical studies. The work was divided into six workpackages (WP): (i) Project management, training and dissemination. (ii) Scientific coordination, (iii) Experimental design, (iv) Regulation and ethics, (v) Data management, and (vi) Statistical analyses.

Our approach was to pair individuals with expertise in each theme with active in vivo stroke practitioners to ensure that contemporary solutions were relevant to scientists in the field.

It is neither appropriate nor desirable that every in vivo experiment is part of a multicentre programme. We believe that hypothesis-generating and testing experiments can and should remain as single-centre studies. However, we envisage the place of multicentre studies in the development pipeline as confirming efficacy in robust and intensively monitored experiments with transparent analysis and reporting. Such data will guide whether or not interventions should be taken forward and tested in human clinical trials.

In WP1 our outputs included defining the practicalities of organising multicentre animal studies, a model consortium agreement, a financial costing model, defining the requirements for Multi-PART study sites. In WP2 we established a framework for the scientific coordination of potential multicentre studies, including a mechanism for initiating and approving studies, with a process for pre-trial knowledge exchange on therapy, an agreement and definition of a core set of rodent models, a template for designing the structure of a study protocol and defined the structure and remit of a Quality and Data monitoring committee. In WP3 we present strategies to maximise the internal and external validity of multicentre animal studies. In WP4 we define the ethical and regulatory environments around the conduct of multicentre in vivo studies, this included identifying the relevant regulatory authorities and approval processes across countries of consortium members and compiling a common application that was presented to an expert working group of the EC to develop guidance and principles for project evaluation and severity assessment of research using animals. In WP5 we have developed a web based data management system for multicentre studies. In WP6 we curated a dataset of previously performed experiments form consortium members to test and rank statistical analysis approaches for multicentre in vivo studies to guide statistical analysis of future studies.

We developed this platform and refined our solutions via a series of teleconferences and face-to-face meetings. Presentations and further details can be found via our website: www.multi-part.org.

Staff involved: Emily Sena (University of Edinburgh, principal investigator), Jeremy Bailoo, Thomas Reichlin, Hanno Würbel (Co-leader of WP3); in collaboration with: David Howells (University of Melbourne), Stuart Allan (University of Manchester), Uli Dirnagl (Charite, Berlin), Malcolm Macleod

(University of Edinburgh), Anna Planas (Institute for Biomedical Research, Barcelona), Mhairi Macrae (University of Glasgow), Denis Vivien (University of Caen), Nathalie Percie du Sert (UK NC3Rs), Joan Montaner (Vall d'Hebron Research Institute, Barcelona), Philip Bath (University of Nottingham), Bart van der Worp (University Medical Centre, Utrecht)

Funding source: EU Framework 7 Programm

Duration: September 2013 to August 2015

Multi-PART

Multicentre Preclinical Animal Research Team

Multi-PART is an international collaborative approach to overcoming the translational roadblock in neuroprotection and neuroregeneration research.

Evaluation of the scientific validity of animal experiments in Switzerland

Thomas Reichlin, Lucile Vogt, Hanno Würbel

Recent evidence in the scientific literature suggests that the validity of animal research is poor, which raises questions about the ethical justification of the use of animals for research. The aim of this project is to systematically analyze the scientific validity of animal research performed in Switzerland. In the first part of the project, authorization requests for animal research (Form A; N=1277) as well as publications resulting from these experiments (N=50) were screened for the reporting of measures against risks of bias affecting internal and external validity. It was found that the prevalence of reporting was rather low in authorization requests as well as publications. This suggest that decisions about the approval of animal experiments by the authorizing authorities as well as decisions about the acceptance of manuscripts for publication are based on trust into, rather than evidence of, the scientific validity of the research.

In order to assess whether such trust is justified, we next conducted an online survey (N=302) and expert interviews (N=5) among in vivo researchers. The results indicate that measures against risks of bias are adhered to substantially more often than reported in authorization requests and publications, but that researchers are not fully aware of the problems and that there is considerable room for improvement.

Since the reproducibility of results primarily depends on their external validity, we further applied computer simulation and meta-analysis to existing datasets from preclinical stroke research to examine whether external validity and reproducibility can be improved by multi-laboratory study designs. Preliminary results suggest that multi-laboratory studies indeed improve external validity and reproducibility, while at the same time reducing the false negative rate.

The results of this project should help to identify shortcomings in experimental design and conduct, and facilitate development of targeted measures to improve the validity of animal research.

Staff involved:
Lucile Vogt (PhD student), Thomas Reichlin (project co-lead and supervisor), Bernhard Voelkl, Christina Nathues, Beatriz Vidondo, Emily Sena (University of Edinburgh, UK), Malcolm Macleod (University of Edinburgh, UK), Hanno Würbel (project lead)
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: May 2013 to April 2016

3.2.2. ZTHZ – Zentrum für tiergerechte Haltung: Geflügel und Kaninchen

Effects of housing design and genetic selection on keel bone damage in laying hens

Ariane Stratmann

Keel bone damage, including deformations and fractures, is a severe welfare problem in commercial laying hens housed in aviary systems. The following approaches to reduce keel bone damage were investigated in this PhD project: i) perch material, ii) aviary design and iii) genetic selection for increased bone strength. Results revealed that compared to metal perches, soft perches reduced keel bone fractures and deformations. Furthermore, ramps that were integrated in the aviary to connect different tiers reduced falls, collisions and keel bone fractures compared to a control group. Laying hens that were selected for stronger bones had fewer fractures as well as a higher keel bone mineral density compared to hens with weaker bones. Also, both experimental lines had a higher mortality and reduced egg shell quality compared to a commercial hybrid line. These findings indicate that targeted modifications of aviary design (soft perch material, structures facilitating vertical movements between tiers), as well as inclusion of bone traits associated with improved bone strength in commercial selection procedures, are promising measures to reduce keel bone damage in laying hens under commercial conditions.

Staff involved: Ariane Stratmann (PhD student), Ernst Fröhlich (FSVO), Alexandra Harlander-Matauschek (University of Guelph, CAN), Michael Toscano, Hanno Würbel, Sabine Gebhardt-Henrich (project lead)
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: August 2011 to September 2014

Soft perches

Ramps inegrated in aviary

Laying hen flock

Prolonged duration of dusk phase to reduce falls and keel bone damage of laying hens in aviary systems

Ariane Stratmann

In aviary systems, laying hens may experience falls and collisions during the dusk and dark phases in the evening when they move up to the highest perches to prepare for night-time roosting. The aim of this project is to reduce falls and collisions and consequently keel bone damage in laying hens by prolonging the duration of the dusk phase in the evening. This extended dusk phase should provide more time for the birds to find their resting sites for the night and settle down. The experiment will be conducted on ten commercial farms in Switzerland, each with two layer barns (same aviary system and hybrid). On each farm, one barn will have a short dusk duration (20 - 30 minutes) and the other barn a prolonged dusk duration (40 - 60 minutes). The number of falls and collisions will be assessed with video observations and the prevalence of keel bone fractures will be assessed with palpation, these data will then be compared between the two treatments at 21 and 45 weeks of age. As of December 2015, the farms have been selected and video recordings and palpations have been conducted on four farms already. The results will provide effective measures to reduce falls and collisions in laying hens housed in aviary systems which are easy to apply in commercial settings.

Staff involved: Ariane Stratmann, Nadine Ringgenberg, Hanno Würbel, Michael Toscano (project lead)
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: May 2015 to April 2017

Broiler breeders use perches

Sabine Gebhardt-Henrich

Broiler breeders in Switzerland and the EU are commonly kept without perches which is inconsistent with the legal requirements. In the first part of the project, we showed that two hybrids, a fast and a relatively slower growing hybrid, used perches and other elevated structures similar to laying hens, especially during the night. However, there were significantly more floor eggs in pens with aviaries. Similar to laying hens, there were also more keel bone fractures in both hybrids in pens with aviaries or perches than in control pens. Furthermore, hens in pens with perches had dirtier plumage. In the second part, we investigated how much perch space the fast growing hybrid needs and whether we can replicate the effects of perches on health and production shown in the first part of the project. We further studied the occurrence of floor eggs and mating behavior in pens with perches and aviaries in more detail.

Staff involved: Sabine Gebhardt-Henrich (project lead), Hanno Würbel, Michael Toscano
Funding source: Federal Food Safety and Veterinary Office (FSVO), Bell AG, Micarna SA, Brüterei Wüthrich
Duration: July 2013 bis June 2016

The fast growing broiler breeder hybrid Ross 308 spends the night on perches or other elevated structures in the barn. Broiler breeders, similar to laying hens, prefer the upper perches on a rack.

Measures to avoid floor eggs in broiler breeders

Laura Candelotto

The activity of broiler breeders in the litter area of three different housing conditions was investigated by video analyses, based on the assumption that this might explain variation in the numbers of floor eggs. Pens with aviaries had higher numbers of floor eggs and lower rates of activity in the litter area compared to pens with perches or control pens. Based on previous observations indicating that floor eggs were predominantly laid in the corners of the pens, possible measures to reduce the number of floor eggs were examined. Reducing the depth of the litter to the legal minimum reduced the number of floor eggs significantly, whereas placing metal sheets in the corners of the pens affected the location but not the number of floor eggs.

Staff involved: Laura Candelotto (BSc biology student), Sabine Gebhardt-Henrich (supervision), Hanno Würbel
Funding source: none
Duration: April 2015 to August 2015

Determination of floor egg position

Effects of feeder placement on behaviour, health and production of laying hens

Janja Širovnik Koščica

Aviary systems are generally considered as welfare-friendly alternatives to cages for laying hens, but the specific impact of different varieties of aviaries on the welfare of the hens needs to be investigated. In most aviary systems hens feed from platforms, but there are also systems that allow animals to feed from perches.

The objective of the first part of my PhD was to compare the welfare and productivity of laying hens feeding either from perches or platforms. We found that in systems where birds had to stand on perches for feeding, hens showed less aggression, less jostling behavior, longer bouts of feeding without interruptions, and more hens were feeding simultaneously, while there were no differences in measures of health and production between the two systems.

Staff involved: Janja Širovnik Koščica (PhD student), Sabine Gebhardt-Henrich, Hanno Würbel, Michael Toscano (project lead)
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: October 2013 to October 2014


In the aviary system shown here, hens need to jump onto perches to get access to feed.

Individual variability in mobility patterns of laying hens in aviary systems

Christina Rufener

In terms of the possibility to perform natural behaviours, aviary systems are animal friendly, but very complex housing systems for laying hens. Several levels with different functional areas (feed, water nest boxes, perches, litter) offer a diverse housing environment for the hens. However, the use of this housing system and its resources was only investigated on a group level so far. To gain information on individual mobility patterns, hens were equipped with infrared sensors. The results of the study should reveal the variability in behaviour within and between animals. Furthermore, the

relationship between behaviour in the system and plumage condition and foot pad lesions will be analysed.

Staff involved: Christina Rufener (PhD student), Justin Varholick, John Berezowski, Michael Toscano (project lead)
Funding source: Federal Food Safety and Veterinary Office (FSVO), Haldimann Stiftung, Eva Husi-Stiftung für Tierschutz
Duration: September 2015 to November 2015

Effects of keel bone damage on behaviour and productivity in laying hens

Christina Rufener

In laying hens, up to 80% of the animal exhibit keel bone fractures, yet the consequences of such fractures for the wellbeing of the hens are difficult to assess. Therefore, the aim of this project is to investigate potential effects of a keel bone fracture on indicators of animal welfare (e.g. decreased activity in the housing system) and productivity (e.g. weaker egg shell). For the first time, mobility patterns as well as productivity are assessed individually and under commercial conditions. Changes in the natural behaviour or impaired biological function due to injuries would be indicators of impaired welfare and, therefore, question the animal-friendliness of the housing system.

Staff involved: Christina Rufener (PhD student), Ariane Stratmann, Hanno Würbel, Michael Toscano (project lead)
Funding source: Federal Food Safety and Veterinary Office (FSVO)
Duration: July 2015 to December 2016

Feeding dye capsules in a specific order enables to assign each egg and its characteristics to a specific hen.

Using tri-axial accelerometers to indicate hazardous motion paths in laying hens

Nikki Mackie

Keel bone fractures are a welfare and economic problem in laying hens. There are many different causes of keel bone fractures such as diet, genetics and housing design. Previous studies have looked at the effect of perch material and the addition of ramps as methods to prevent falls and collisions

and therefore, help to limit the prevalence and severity of keel bone fractures. However, there has not yet been a study investigating the force exerted on the keel bone during a fall or collision and whether the force on the keel bone is different depending on the location of the impact. Tri-axial accelerometers will be used to measure acceleration and deceleration. This will be related to the path of motion of the individual focal birds and give an indication to which motions are hazardous, i.e. which movements will likely result in keel injury. The aim is to identify hazardous areas within the Bolegg aviary system and make alterations that reduce the number of keel threatening events.

Staff involved: Nikki Mackie (guest PhD student, University of Bristol, UK), John Tarlton (University of Bristol, UK), Michael Toscano
Funding source: Biotechnology and Biological Sciences Research Council (BBSRC, UK), Eva Husi-Stiftung für Tierschutz (CH), Haldimann Stiftung (CH)
Duration: May 2015 to February 2016

Bolegg aviary system (left); vest and accelerometers (middle); hen wearing the vest, accelerometer and back pack (right)

3.3. Cooperating partners

Our Most important external partners:

- Epidemiologie-Abteilung, Vetsuisse-Fakultät, Universität Zürich (CH)
- Institut für Lebensmittelsicherheit (ILS), Vetsuisse-Fakutät, Universität Zürich (CH)
- Swiss Tropical and Public Health-Institute (STPHI), Basel (CH)
- Hochschule für Agrar-, Forst- und Lebensmittelwissenschaften (HAFL), Berner Fachhochschule (CH)
- Agroscope Liebefeld-Posieux (ALP), Liebefeld (CH)
- Agroscope Liebefeld-Posieux (ALP-Haras), Schweizerisches Nationalgestüt (SNG), Avenches (CH)
- Institut für Agrarwissenschaften, ETH Zürich (CH)
- Agroscope Reckenholz-Tänikon (ART), Tänikon (CH)

- SAFOSO, Safe Food Solutions, Bern (CH)
- Center for Animal Diseases Modeling and Surveillance (CADMS), University of California, Davis (USA)
- Faculty of Veterinary Science University of Sydney, Australia
- National Veterinary Institute (NVI), Oslo (NO)
- University of Wageningen (NL)
- Royal Veterinary College, London (UK)
- Institut für Biometrie, Epidemiologie und Informationsverarbeitung (IBEI), TiHo Hannover (DE) Aussenstelle für Epidemiologie, TiHo Hannover (DE)
- Centre for Clinical Brain Sciences, University of Edinburgh (UK)
- Emily SenaSchool of Veterinary Sciences, University of Bristol (UK) School of Life Sciences, University of Lincoln (UK)
- Department of Animal and Poultry Science, University of Guelph (Canada)
- Comparative Medicine, Stanford School of Medicine (USA)

4. Teaching

4.1. Core curriculum, University of Berne

Biostatistics and Epidemiology
1st Year, Vetsuisse-Faculties, University of Bern & Zürich
Responsible lecturers: Prof. Dr. Gertraud Schüpbach, Prof. Paul Torgerson

Ethology, Animal Welfare and Animal Husbandry

1st Year, Vetsuisse-Faculties, University of Bern & Zürich
Responsible lecturers: Prof. Dr. Hanno Würbel

Veterinary Public Health I - Clinical Epidemiology

3rd Year, Vetsuisse-Faculty, University of Bern

Responsible lecturer: Prof. Dr. Gertraud Schüpbach

Veterinary Public Health II - Animal Disease Control and Animal Welfare Legislation

4th Year, Vetsuisse Faculties, University of Bern & Zürich
Block coordination: Dr. Ioannis Magouras, Prof. Dr. Gertraud Schüpbach

Computer based learning
An electronic learning module (called E-Epidemiology) for learning epidemiological measures was developed with the support of the companies Epi-Interactive (New Zealand) and SAFOSO (Switzerland). The module was partially funded by the teaching commission of the Vetsuisse Faculty.

The E-Learning module was developed to train official veterinarians in Switzerland in the topics of outbreak investigation, monitoring and surveillance, and risk assessment. This E-Learning module was applied as a blended learning approach in which: 1) veterinarians worked through the module at home, 2) the contents of the module were discussed in the classroom, and 3) applied in case studies and group learning exercises.

4.2. Post graduate Education and Continuing Professional Education

Short course in Statistics with NCSS
The VPHI offers a 2-day practical course to introduce statistical concepts using the Windows-based software package NCSS, is currently being offered twice a year. Target audiences are Veterinary Medicine and doctoral (DVM, PhD) students and researchers who wish to acquire or re-acquire basic skills in statistical analysis.
Course language: English

Introduction to Epidemiology and Biostatistics Summer Course

A two week summer course at the University of Bern targeted at graduate students and European College residents. The course is designed to give students a basic understanding of epidemiology and biostatistics. The first week deals with introductory epidemiology and biostatistics, the second week deals with more advanced topics. The statistical methods covered in this course are similar to those covered in the Short Course in Statistics Using NCSS but in much more detail and using the R statistical platform (www.r-project.org/).
Course language: English

Internal Residency training sessions in Epidemiology and Biostatistics
Annual course with 8-10 half-day modules on selected advanced epidemiological and statistical topics

Training of official veterinarians
The VPHI provides two days of training for Swiss Official Veterinarians in the spring and fall each year. The training is in animal health focusing on the topics: monitoring and surveillance, epidemiological outbreak investigation, and sample size calculation. The VPHI is also participates in the examination process for accrediting official veterinarians in Switzerland.

4.3. External Courses

Ethics and Philosophy of Biology (2 ECTS), Phil. Nat. Faculty, University of Bern, H. Würbel (annually)

5. Services

5.1. Services for the Federal Veterinary Authorities

The VPHI works in close collaboration with the Swiss Federal Veterinary and Food Safety Office (BLV) on many applied research projects, risk assessments, scientific reports and the implementation of other technical initiatives.

In the years 2014 and 2015, researchers of VPHI were involved in the following working groups:

Antimicrobial Resistance Working Groups
Gertraud Schüpbach, Bart van den Borne

VPHI is involved in various working groups that support the design and implementation of the National Strategy Antimicrobial Resistance (STAR). These working groups have developed strategies for reducing antimicrobial use in animals in Switzerland, and have contributed to the development of more efficient surveillance of antimicrobial usage and resistance.
Partners: Sabina Büttner, Dagmar Heim (BLV), Alexander Schaub (BAG), Karin Wäfler (BAG)
Time: ongoing

Sheep Footrot Working Group
Gertraud Schüpbach, Salome Dürr
A footrot control program was implemented in the Canton of Grisons based on cantonal legislation. The aim of this working group is to identify optimum strategies for controlling the disease, and to lay the foundation for a future National control program.
Partners: Rolf Hanimann, Giochen Bearth (Kanton GR), Adrian Steiner (Wiederkäuerklinik Vetsuisse Bern), Joachim Frey (Veterinärbakteriologie Vetsuisse Bern), Christina Härdi-Landener (ETH Zürich)
Time: ongoing

5.2. Services for the Vetsuisse faculty

The VPHI provides an epidemiology and biostatistics consulting service to researchers and graduate students at the University of Bern. Services range from group consulting to individually tailored service. The service is very popular with more than 100 research projects being supported by VPHI during the years 2014 and 2015.

5.3. Services for other parties

- Swiss Representative in the International Society for Animal Hygiene (G. Schüpbach)
- Examination committee Swiss official veterinarians (G. Schüpbach)
- External Examiner course “Management of Infectious Disease Outbreaks in Animal Populations, Royal Veterinary College (G. Schüpbach)
- Referee for EU research proposals (Marie Curie und ANIHWA) (G. Schüpbach)
- Member of the expert committee Biomedical Sciences of the Graduate School for Cellular and Biomedical Sciences (G. Schüpbach, H. Würbel)
- Member Senat der Schweizerischen Akademie der Medizinischen Wissenschaften (SAMW), Schweiz (H. Würbel)
- Member Kommission für Tierversuchsethik der Akademien der Wissenschaften Schweiz (SCNAT, SAMW), Schweiz (H. Würbel)
- Member Tierschutzkommission des Bundesministeriums für Ernährung, Landwirtschaft und Verbraucherschutz (BMEL), Deutschland (H. Würbel)
- Advisory Board Berlin-Brandenburger Forschungsplattform BB3R, Deutschland (H. Würbel)
- Member Kommission der Zentralstelle zur Erfassung und Bewertung von Ersatz- und Ergänzungsmethoden zum Tierversuch (ZEBET) am Bundesinstitut für Risikobewertung (BfR), Deutschland (H. Würbel).
- Member management board of the International Society for Animal Husbandry IGN (H. Würbel)
- Editorial Board Member Applied Animal Behaviour Science (AABS) (H. Würbel)
- Editorial Board Member Kleintierpraxis (H. Würbel)
- Member of the Board of Directors: International Society for Disease Surveillance (J. Berezowski)

6. Events / Conference contributions / Publications

6.1. Events organised

- DACH Epidemiology conference in collaboration with Epi-Forum and Vetsuisse Faculty Zurich, 03rd – 05th of September 2014
- VPH annual conference at the 03rd of December 2015
- International Workshop on Animal Health Surveillance in collaboration with the European College for Veterinary Public Health
- International Workshop on Keel Bone Damage in Laying Hens, Aviforum, Zollikofen, 7.-9.4.2014
- PhD Symposium, Human-animal interactions: impacts on animal welfare and behavior, Vetsuisse Fakultät Bern, 30.4.2014

6.2. Conference contributions (Abstracts)

Members of the Institute delivered a large number of posters, and presentations at meetings, conferences and workshops around the world.

6.3. Publications (peer-reviewed)

6.3.1. Division VPH/Epidemiolgy

Aebi M, **van den Borne B**, Raemy A, Steiner A, Pilo P, Bodmer M Mycoplasma bovis infections in Swiss dairy cattle: a clinical investigation Acta Veterinaria Scandinavica (2015)

Alsaaod M, Niederhauser JJ, Beer G, Zehner N, **Schuepbach-Regula G**, Steiner A. Development and validation of a novel pedometer algorithm to quantify extended characteristics of the locomotor behavior of dairy cows. J Dairy Sci. 2015 Sep;98(9):6236-42. doi: 10.3168/jds.2015-9657. Epub 2015 Jul 2. PubMed PMID: 26142842.

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6.3.2. VPHI Division ANIMAL WELFARE

Pubications (peer-reviewed)

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Schai-Braun, S.C., **Reichlin, T.S.**, Ruf, T., Klansek, E., Tataruch, F., Arnold, W., & Hackländer, K. (2015) The European Hare (Lepus europaeus): A Pcky Herbivore Searching for Plant Parts Rich in Fat. PloS One, 10(7), e0134278.

Stratmann, A., Fröhlich, E. K. F., **Gebhardt-Henrich, S. G.**, Harlander-Matauschek, A., **Würbel, H.**, & **Toscano, M. J.** (2015). Modification of aviary design reduces incidence of falls, collisions and keel bone damage in laying hens. Applied Animal Behaviour Science, 165, 112–123.

Stratmann, A., Fröhlich, E. K. F., Harlander-Matauschek, A., Schrader, L., **Toscano, M. J., Würbel, H., & Gebhardt-Henrich, S. G.** (2015). Soft perches in an aviary system reduce incidence of keel bone damage in laying hens. PloS One, 10(3), e0122568.

Toscano, M. J., Booth, F., Wilkins, L. J., Avery, N. C., Brown, S. B., Richards, G., & Tarlton, J. F. (2015). The effects of long (C20/22) and short (C18) chain omega-3 fatty acids on keel bone fractures, bone biomechanics, behavior, and egg production in free-range laying hens. Poultry Science, 94(5), 823–35.

7. Others

The Institute was represented in the media by various television appearances, newspaper articles and conference papers.

7.1. Articles in journals and media

7.1.1. Division VPH-Epidemiology

G. Schüpbach: Antibiotikaresistenz bei Mensch, Tier und Umwelt – ein komplexes Problem gemeinsam angehen. DoXmedical 1-2016.

G. Schüpbach: Syndromüberwachung: Neue Krankheiten früh erkennen. Tiergesundheitsbericht 2015, Bundesamt für Lebensmittelsicherheit und Veterinärwesen.

G. Schüpbach and Paul Torgerson: Veterinary public health and veterinary epidemiology: partner disciplines for the protection of humans from zoonotic diseases, VSH-Bulletin Nr. 1/2, April 2015.

7.1.2. Division Animal Welfare

Ringgenberg, N. Eine Trennwand im Nest? Auswirkungen einer Trennwand im Nest auf die Präferenz und das Legeverhalten von Hennen. Schweizerische Geflügelzeitung.

Würbel, H. Forschung für Tierschutz. Tierschutzbericht 2014, Bundesamt für Lebensmittelsicherheit und Veterinärwesen.

Würbel, H., Rohrbach, H., Spadavecchia, C., Segner, H., Hemphill, A. Tierschutz – veterinärmedizinisches Fachgebiet. VSH-Bulletin Nr. 1, April 2015.

7.2. Completed Dissertations & Master (Msc.) Work on research

7.2.1. Division VPH-Epidemiology

- Rahel Struchen: Development of a syndromic surveillance system to enhance early detection of emerging and re-emerging animal diseases, PhD thesis University of Basel 2015
- Sara Schärrer: The slaughterhouse as data source for monitoring programmes in cattle, PhD thesis University of Basel 2014
- Corinne Arnold: Risk factors for oral antimicrobial consumption in Swiss fattening pig farms: a case-control study. Diss. Vet.med. Vetsuisse Bern 2015
- Nadine Stebler: Prioritization of zoonotic agents in Switzerland for their surveillance and control, Diss. Vet.med. Vetsuisse Bern 2015

- Aurélie Tschopp: A multi-arm randomized field trial evaluating support strategies to improve udder health in Swiss dairy herds, Diss. Vet.med. Vetsuisse Bern 2014
- Jeanny Casey: Die Ausrottung des Rinderabortus Bang in der Schweiz von 1927-1970 aus heutiger Sicht. MSc thesis, Vetsuisse Fakultät Bern, 2014
- Christina Nathues: finished Residency-Education European College of Veterinary Public Health (2014)
- Franziska Wohlfender: finished Residency-Education European College of Veterinary Public Health (2014)

7.2.2. Division Animal Welfare

- Janja Novak: Stereotypy as a welfare indicator: Linking stereotypies in laboratory mice with measures of affective state and im-paired behavioural inhibition, PhD thesis, University of Bern 2015.
- Nadine Ringgenberg: An investigation of nest characteristics and social factors affecting pre-laying behaviour and nest choice in laying hens. PhD thesis, University of Bern 2014.
- Ariane Stratmann: Keel bone damage in laying hens – effects of soft perches, aviary design and genetic selection of bone strength. PhD thesis, University of Bern 2014.
- Kathryn Finlayson: Identifying facial expressions of positive emotions in rats. MSc thesis, University of Edinburgh 2014.
- Sibylle Furrer: Untersuchung des Persönlichkeitsmerkmals „Sensory Processing Sensitivity“ bei Hunden. MSc thesis, Vetsuisse Fakultät Bern 2015.
- Natascha Kammerlander: Auswirkungen des Milchabsetzens auf orale Verhaltenweisen bei Saugferkeln in technischen Ferkelammen. MSc thesis, Vetsuisse Fakultät Bern 2014.
- Sabrina Ruchti: Einfluss der Verspieltheit von Ratten auf das Spielverhalten ihrer Käfigpartner. MSc thesis, Vetsuisse Fakultät Bern 2015.
- Paula Ospitia Rodriguez: Are playful rats better able to effectively cope with challenging situations? MSc thesis, University of Edinburgh 2015.
- Samantha C. Smith: Eyes as windows of the soul: What eye wrinkles can tell us about the emotional state of horses. MSc thesis, University of Edinburgh 2014.

7.3. Awards and Prizes for Research

7.3.1. Division VPH-Epidemiology

Best Graduate Student Prize for the Oral Presentation of **“**The Quantitative Outcome of a “One Health” approach to study complex health issues: a Systematic Review” at the 14th International Symposium on Veterinary Epidemiology and Economics, Mérida, Mexico (November 2015).
Laura Falzon

Scotland Rural College Prize for the Oral Presentation of “A Systematic Review and Meta-Analysis of Factors Associated with Anthelmintic Resistance in Sheep” at the Annual Meeting of the Society for Veterinary Epidemiology and Preventive Medicine, Dublin, Ireland (March 2014). **Laura Falzon**

Prize for best talk: 7th Symposium Graduate School of Health Sciences 2015 (Münchenwieler, Switzerland) **Carmo, L.P**.; Schüpbach, G.; Müntener, C.; Alban, L.; Nielsen, L.R.; Magouras, I. – Quantification of antimicrobial use in Swiss pigs: comparison with other livestock species and with Danish pigs.

Best Poster Prize: Annual Scientific Conference of the European College of Veterinary Public Health 2015 (Belgrade, Serbia). Filippitzi, M.; **Carmo, L.P**.; De Meneghi, D., Nielsen, L.R.; Häsler, B. - Transdisciplinary collaboration across Europe to promote Global Health: Network for Evaluation of One Health (NEOH)

7.3.2. Division Animal Welfare

Best Poster Prize: Ariane Stratmann for her poster „Ramps in aviaries reduce falls and fractured keel bones in commercial laying hens" at the 48th congress of the International Society of Applied Ethology (ISAE) 2014 in Vitoria-Gasteiz, Spain.

Jean-Pierre Miéville Preis 2014: Nadine Ringgenberg for her paper Ringgenberg, N., Fröhlich, E. K. F., Harlander-Matauschek, A., Würbel, H., & Roth, B. A. (2014). Does nest size matter to laying hens? Applied Animal Behaviour Science, 155, 66–73, verliehen von der Vetsuisse Fakultät, Uni Bern.

Best Poster Prize: Sara Hintze for her poster "To go, or not to go: Is that the question? Comparison of a Go/No-go and an Active Choice Design to assess cognitive biases in horses" at the 10th conference of the International Society for Equitation Science (ISES) 2014 in Denmark.

ISAE Creativity Award 2015: Hanno Würbel for his work on impairment of validity of animal testing through standardization at the 49th conference of the International Society for Applied Ethology (ISAE) in Sapporo, Japan.

Best Student Presentation Award: Sara Hintze for her talk "When I look into your eyes...What eye wrinkles in horses tell us about their emotional state" at the 11th conference of the International Society for Equitation Sciences (ISES) 2015 in Vancouver, Canada.

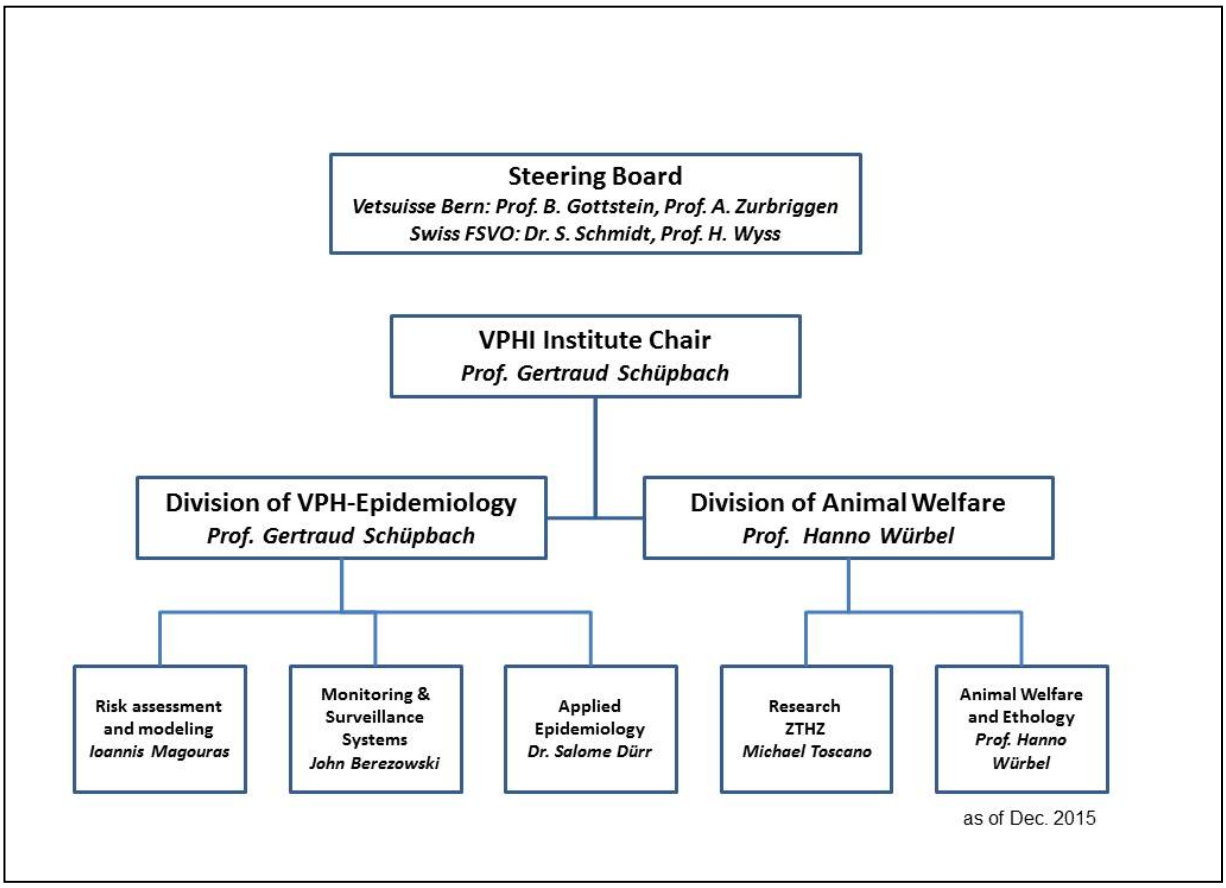
IGN-Forschungspreis 2015: Research award of the International Society for Animal Husbandry (Internationalen Gesellschaft für Nutztierhaltung, IGN) to **Ariane Stratmann** for her Dissertation on causes of sternal lesions in laying hens, and strategies for prevention. Because the research had high practical relevance, Ariane Stratman was also awarded a special trophy ("Der gute Hirte").

IGN-Forschungspreis 2015: to **Eimear Murphy** for her dissertation on the development of a test for the evaluation of emotional states of pigs based on cognitive processes (thesis submitted to the University of Utrecht).

8. The VPHI introduces itself

The institute is strategically guided by a steering board consisting of representatives of the two main funding organizations: 1) the Vetsuisse Faculty, University of Bern, and 2) the Swiss Federal Veterinary Office.

8.1. Org chart 2015



8.2. Team VPH/Epidemiology

Berezowski, John / Doherr, Marcus (until 31.01.2014) / Dürr, Salome / Falzon, Laura / Gomes do Carmo, Luis Pedro / Küker, Susanne / Lechner, Isabel / Lerch, Susanne / Magouras, Ioannis / Nafzger Bigler, Rebekka (until 28.02.2014) / Nathues, Christina / Ruegg, Simon (until 30.04.2015) / Schärrer, Sara (until 31.03.2014) / Schüpbach, Gertraud / Schwendner, Anna-Alita(until 30.06.2015) / Stebler, Nadine (until 30.11.2014) / Struchen, Rahel (until 31.08.2015) / Tedder-Vial, Flavie (until 30.09.2015) / Thomann, Beat / Tschopp, Aurélie / van den Borne, Bart / Vidondo, Beatriz / Wanda, Sabine / Wohlfender, Franziska (until 31.01.2015)/ Zingg, Dana

In the picture from left to right; first line: Laura Falzon, Céline Faverjon, Susanne Küker, Aurélie Tschopp, Gertraud Schüpbach, Susanne Lerch; second line: Ioannis Magouras, Beat Thomann, Isabel Lechner, Luís Comes, John Berezowski, Sabine Wanda, Bart von den Borne. Unfortunately, not all persons were present for this picture.

8.3. Team animal welfare

Bailoo, Jeremy / Bräm, Maya / Gebhardt, Sabine / Herzog Anna (01.10.2015 – 31.01.015) / Hintze, Sara / Lampe, Jessica / Melotti, Luca / Moser, Karin / Murphy, Eimear / Novak, Janja (until 30.06.2014) / Reichlin, Thomas / Ringgenberg, Nadine (until 31.08.2014) / Rufener, Christina / Sirovnik, Janja / Sommerer, Tina (until 31.10.2014) / Stratmann, Ariane (until 31.07.2014) / Toscano, Michael / Varholick, Justin / Vogt, Lucile / Völkl, Bernhard / Würbel, Hanno

In the picture from left to right; first line: Luca Melotti, Eimear Murphy, Lucile Vogt, Nikki Mackie, Susanne Lerch; second line: Justin Varholick, Hanno Würbel, Sara Hintze, Thomas Reichlin. Unfortunately, not all persons were present for the picture.

8.4. Secretary and administration

- Lerch, Susanne

8.5. Maps and contact address

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Email: info@vphibern.ch / www.vphi.ch

map

VPHI-Epidemiologie animal hospital, Länggassstr. 124, 3012 Bern

map

VPHI-Tierschutz animal hospital, Länggassstr. 120, 3012 Bern

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map

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http://www.aviforum.ch/downloads/R633_Anfahrt_Aviforum_2010_D.pdf

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